

BAB IV

HASIL DAN PEMBAHASAN

4.1 Pengumpulan Data

Proses pengumpulan data meliputi pengumpulan data video yang kemudian dicatat penempatan *Shuttlecock* dari setiap videonya.

1. Pengumpulan data video siaran, data yang digunakan adalah berupa video siaran permainan bulutangkis yang bersumber dari *Youtube* dengan tautan *www.youtube.com*. Data video yang diambil bertujuan untuk mencari dan mencatat setiap penempatan bola. Data yang telah diambil dapat dilihat pada table 4.1:

Tabel 4.1 Data Video Bulutangkis

No	Deskripsi video	Atlet	Tautan
1	All England Open 2017	Lee Chong Wei vs Shi Yuqi	https://www.youtube.com/watch?v=SjIJ_cV3DdA
2	Sea Games 2017	T. M. Nguyen vs Jonatan Christie	https://www.youtube.com/watch?v=938zdeZnApg&index=2&list=WL&t=1487s
3	Japan Open 2017	LEE Chong Wei vs Viktor AXELSEN	https://www.youtube.com/watch?v=e3bOBH6os_c
4	Uber Cup 2014	Sindu vs Bellaetrix	https://www.youtube.com/watch?v=M1izvhVKngM&pbjreload=10

No	Deskripsi video	Atlet	Tautan
5	Dubai World Superseries Finals 2016	Carolina Marin vs Pusarla V. Sindhu	https://www.youtube.com/watch?v=VD_qpHOdAIk
6	Dubai World Superseries 2016	Viktor Axelsen vs Lee Chong Wei	https://www.youtube.com/watch?v=Fx4c0ZxHPoY
7	Kento Momota vs Lin Dan	All England Open 2015	https://www.youtube.com/watch?v=COBtDkq7Zqw
8	Lin Dan vs Chen Long	Wang Lao Ji BWF World Champions 2013	https://www.youtube.com/watch?v=-pnq5but1xM
9	Chou Tien Chen vs Kento Momot	Yonex Denmark Open 2015	https://www.youtube.com/watch?v=My_ZPJVfriE
10	Danisa Denmark Open 2017	Kidambi Srikanth vs Viktor Axelsen	https://www.youtube.com/watch?v=u7yDYU4b7CU
11	Dubai World Superseries 2017	Ratchanok Intanon vs Sung Ji Hyun	https://www.youtube.com/watch?v=O9QpMaoR5sQ
12	Hongkong Open 2013	Wang Yihan vs Wang Shixian 2013	https://youtu.be/-PaGkpO9a1o
13	French Open Semi Final 2015	Wang Shixian vs Ratchanok Intanon	https://youtu.be/duLoURmslyc
14	Dubai World Superseies 2017	Chou Tien Chen vs Shi Yuqi	https://youtu.be/iop_SUeCIY

No	Deskripsi video	Atlet	Tautan
15	Dubai World Superseies 2017	Tai Tzu Ying vs Chen Yufei	https://youtu.be/O_f0bMC_fEG8
16	All England 1990	Susi Suanti vs Huang Hua	https://www.youtube.com/watch?v=rLnvl4T9djM
17	Asia Mixed Team Championship 2017	Gregoria Mariska vs Lee Ying Ying	https://www.youtube.com/watch?v=VxToV4fwu90
18	All England Open 2012	Lee C.W. vs Lin Dan	https://www.youtube.com/watch?v=TRNKfBmCa8M&t=499s
19	Yonex Sunrise Imdia Open 2017	Saina Nehwal vs Pusarla V. Shindu	https://www.youtube.com/watch?v=jeM_Woxtpw
20	Yonex All England Opemn 2017	Tai Tzu Ying Pusarla V. Shindu	https://www.youtube.com/watch?v=fUNkKIH1zQw

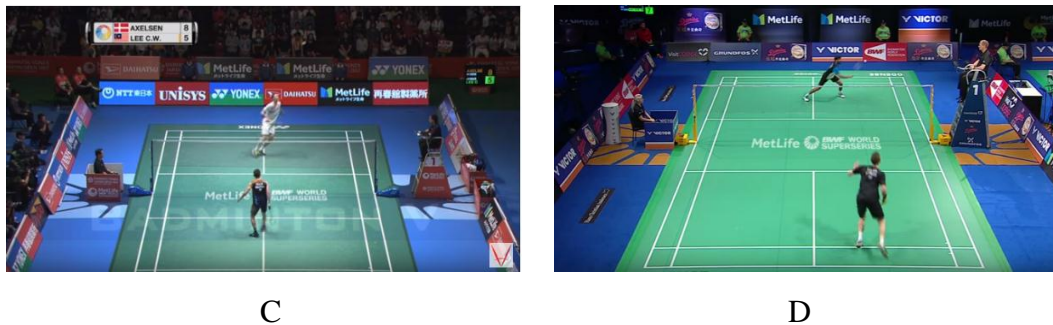
Video yang digunakan sebanyak enam video dimana masing-masing video karakteristik yang berbeda-beda seperti yang terlihat pada gambar 4.1



A



B



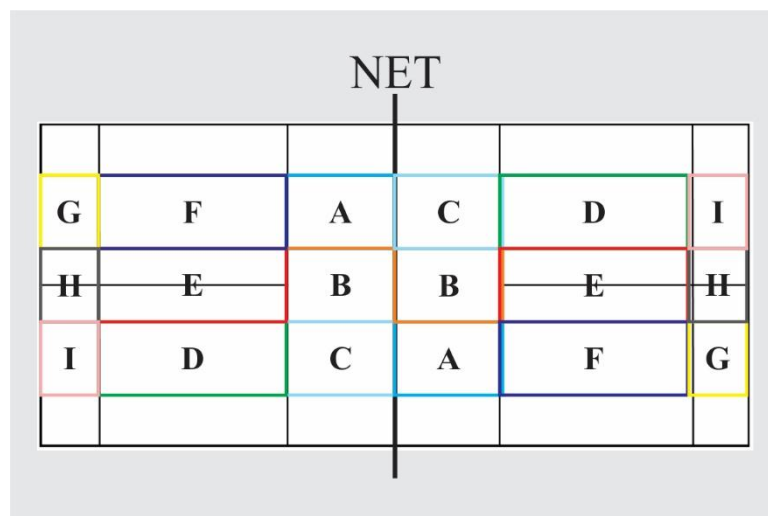
Gambar 4.1 Pratinjau Data Video Bulutangkis

Gambar 4.1 menampilkan pratinjau dari pertandingan bulutangkis yang akan dicatat setiap penempatan bolanya untuk dilakukan uji coba, dengan Gambar 4.1 (a) merupakan video ujicoba nomor 1, Gambar 4.1 (b) merupakan video uji coba nomor 2, Gambar 4.1 (c) merupakan video ujicoba nomor 3 dan Gambar 4.1 (d) merupakan video uji coba nomor 4.

2. Pengumpulan data penempatan *shuttlecock* dan jenis pukulan, data penempatan *shuttlecock* dan jenis pukulan dikumpulkan untuk keperluan eksperimen pada perangkat lunak. Data ini diperlukan karena proses eksperimen akan dilakukan dengan cara mengecek inputan dan dicari didalam data base. Dengan eksperimen tersebut, data penempatan bola berfungsi sebagai penempatan bola asli pada video. Data yang telah dikumpulkan berisi data penempatan bola dengan format `”*.CSV”` seperti yang tertera pada tabel 4.1.

4.1.1 Pembagian Zona Lapangan Bulutangkis dan Jenis Pukulan

Tahap ini dilakukan setelah pengumpulan data video, dalam proses sebelumnya dilakukan pengumpulan data video untuk mendapatkan penempatan *shuttlecock* yang nantinya penempatan tersebut dijadikan data dalam penelitian ini. Untuk mendapatkan data penempatan shuttlecock, penulis membagi Sembilan titik zona lapangan dari setiap pemain. Banyaknya zona dibagi berdasarkan kemampuan penglihatan dalam mengetahui letak penempatan *shuttlecock* dalam video. Semakin banyak zona yang ditentukan maka semakin sulit untuk mengamati penempatah *shuttlecock* dalam video.



Gambar 4.2 Pembagian Zona Lapangan

Pada Gambar 4.2 menunjukkan pembagian zona lapangan yang dibagi menjadi sembilan titik. Dari Sembilan titik tersebut setiap titik diberi nama dengan karakter-karakter. Dibagian depan dari setiap pemain atau bagian yang dekat dengan garis net adan tiga titik yang diberi nama dengan karakter A, B dan C. dibagian tengah dari setiap pemain ada tiga titik yang diberi nama dengan karakter D, E dan F. dibagian belakang dari setiap pemain ada tiga titik yang diberi nama dengan karakter G, H dan I.

Selain penempatan *shuttlecock* penulis juga membagi jenis pukulan dalam permainan bulutangkis, adapun jenis pukulan yang akan digunakan dalam penelitian ini ada empat, yaitu: pukulan Dropshot yang dinamakan pukulan satu, pukulan melambung dinamakan pukulan dua, pukulan Smash dinamakan pukulan tiga dan pukulan netting dinamakan pukulan ke empat.

Sebagai contoh, diberikan enam pukulan-pukulan yang bergantian dari pemain satu ke pemain lawan yang terlihat pada gambar 4.2.



A



B



C



D



E



F

Gambar 4.3 Penempatan *Shuttlecock*

Ketika *shuttlecock* tersebut berpindah dari pemain satu ke pemain lawan dilakukan pencatatan posisi *shuttlecock* dengan zona yang ditempati.

Dari gambar 4.3 terdapat titik titik zona yang dilewati enam pukulan pukulan yang dijelaskan sebelumnya. pada gambar 4.3 A pemain 1 menempatkan bola ke titik A ke daerah permainan pemain 2, gambar 4.3 B pemain 2 mengembalikan bola ke area permainan pemain 1 ke titik I, gambar 4.3 C pemain

1 mengembalikan bola ke area permainan pemain 2 ke titik E, gambar 4.3 D pemain 2 mengembalikan bola ke area permainan pemain 1 ke titik D, gambar 4.3 E pemain 1 mengembalikan bola ke area permainan pemain 2 ke titik C, gambar 4.3 F pemain 2 megembalikan bola ke area permainan pemain 1 ke titik H. Dalam enam pukulan pukulan tersebut didapatkan pada tabel 4.2.

Tabel 4.2 Penempatah *Shuttlecock*

P1	P2	P1	P2	P1	P2	P1
A,4	I,2	E,1	D,2	C,1	H,2	0

Pada tabel 4.2 menunjukan bahwa penempatan dari 4.3 shuttlecock yang dilakukan oleh Pemain 1 (P1) dan Pemain 2 (P2). P1 menempat bola pada titik A di area permainan pemain 2, kemudia bola dikembalikan oleh pemain 2 ketiti I di area permainan pemain 1, pemain 1 menempatkan bola ke titik E di area permainan pemain 2, pemain 2 mengembalikan lagi bola ke titik D di area permainan pemain 1, kemudian pemain 1 mengembalikan bola dan diarahkan ke titik C di area permainan pemain 2, pemain 2 mengembalikan bola ke titik D diarea permainan pemain 1 dan pemain 1 tidak bisa mengembali bola ke area permainan pemain 2 (bola menyangkut di Net) atau bola yang dikembalikan oleh pemain 1 keluar dari lapangan permainan yang disimbolkan dengan angka 0 (nol).

4.1.2 Pencatatan Penempatan *Shuttlecock*

Pada tahap ini dilakukan pencatatan penempatan *shuttlecock*. Pada tahap pencatatan penempatan *shuttlecock* dilakukan setelah video pertandingan bulutangkis didapatkan dari tahap pengumpulan data video pada sub bab 4.1.

Dari dua puluh video yang didapatkan dan dilakukan pencatatan penempatan *shuttlecock*, dalam satu video pertandingan didapatkan delapan puluh sampai Sembilan puluh baris penempatan *shuttlecock*, setiap baris penempatan *shuttlecock* didapatkan dari pukulan-pukulan pemain satu dengan pemain lawan dalam menghasilkan satu poin dalam permainan bulutangkis. Hasil pencatatan penempatan *shuttlecock* dari dua puluh video yang tersedia akan dijadikan data dalam program yang akan dijelaskan pada sub bab 4.2.6

4.1.3 Penyusunan data Menjadi Tabel (CSV)

Setelah semua data penempatan *shuttlecock* didapatkan, data tersebut disatukan secara menyeluruh dengan cara mentransformasikan data penempatan *shuttlecock* ke format *CSV*. Dimana data dalam format *CSV* tersebut berupa karakter-karakter yang menggambarkan penempatan jatuhnya *shuttlecock*. Berikut merupakan data yang telah ditransformasikan ke format *CSV*:

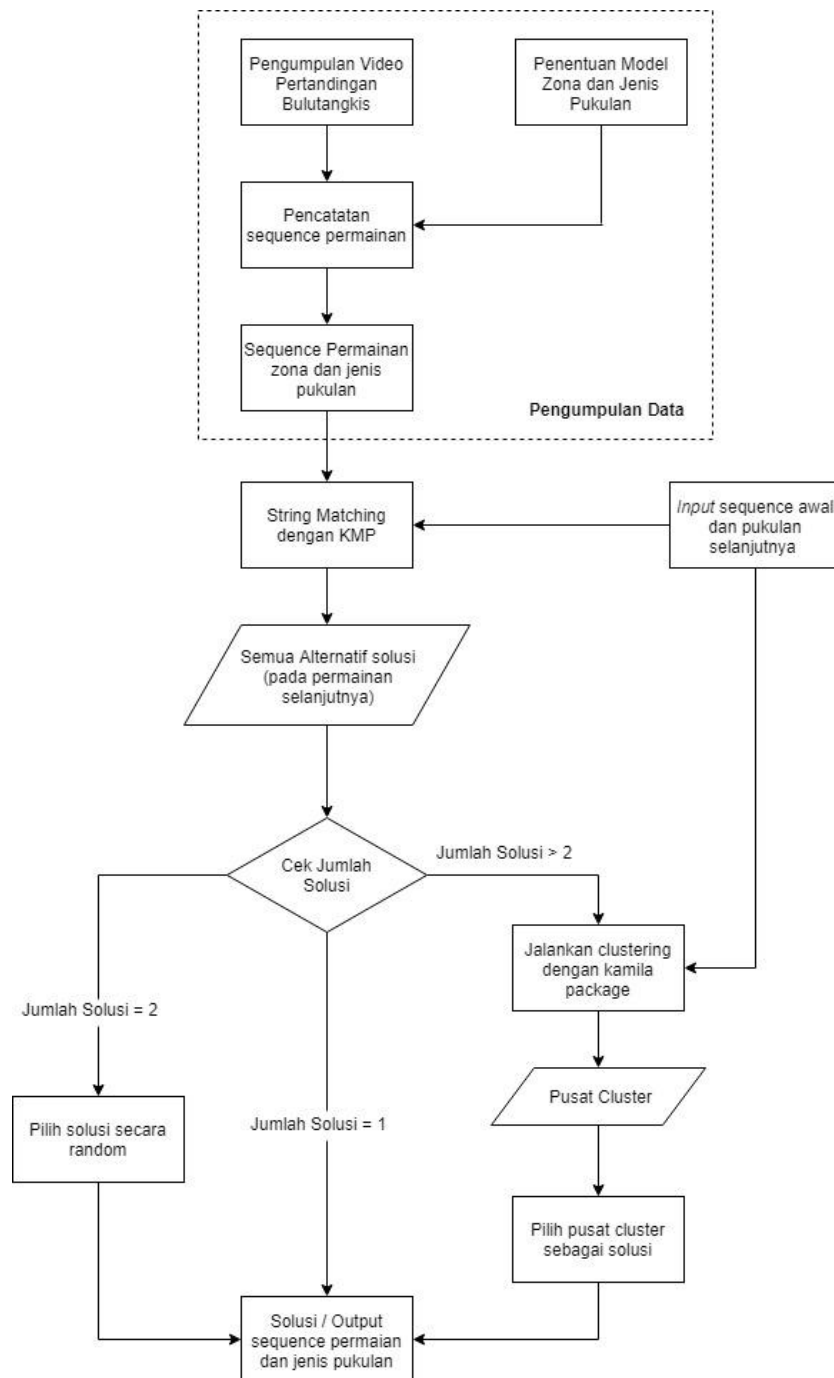
Tabel 4.3 Penempatan Shuttlecock dalam bentuk CSV

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	H,1	F,2	F,1	C,1	H,1	A,2	A,1							
2	H,1	I,1	G,1	A,3	A,2	E,2								
3		H,1	H,1	I,1	F,1	F,2	E,3	B,2	C,1					
4	H,1	C,1	I,2											
5	H,1	F,1	B,2	F,1	B,1	F,1	H,2	H,1	C,2	D,3	C,2	H,3	H,2	
6	H,2	H,1	B,1	C,1	C,1	H,1	C,2	C,1	I,2	D,1	B,1	H,2	B,2	
7	H,1	A,1	G,1	A,2	G,2									
8	G,1	H,1	H,1	H,1	C,1	B,1	H,1	F,2	C,2	I,1	G,1	A,1	I,1	C,2
9		G,1	B,1	C,1										
10		H,1	D,1	E,1	E,1									

Tabel 4.3 merupakan data penempatan *shuttlecock* dan jenis pukulan yang sudah ditransformasikan ke bentuk *CSV*. Pada baris pertama di Tabel 4.3 menjelaskan bahwa kolom A dan baris 1 merupakan *shuttlecock* yang diarahkan ke titik H dengan jenis pukulan dropshot dan pada kolom B baris 1 merupakan *shuttlecock* yang diarahkan ke titik F dengan jenis pukulan Melambung. Penulisan pada setiap baris akan terus dilakukan hingga permainan mati (berhenti) pada setiap poin, yang artinya satu baris pada data *.CSV mewakili satu poin di permainan bulutangkis.

4.2 Pengembangan Model

Dalam implementasi algoritma Knuth-Morris-Pratt, penulis merancang sebuah model agar berjalanya konsep *Knuth-Morris-Pratt* pada pencarian strategi penempatan *shuttlecock*. Proses ini dilakukan dalam beberapa tahap dan akan dijelaskan di sub-bagian selanjutnya.



Gambar 4.4 Perancangan model Strategi Penempatan *Shuttlecock*

Pada Gambar 4.4 pengembangan model strategi penempatan *shuttlecock*, terdapat beberapa langkah yang dilakukan. Gambar 4.4 menunjukkan alur pembangunan model *Knuth-Morris-Pratt* yang dilakukan dalam penelitian ini. Berikut penjelasan langkah-langkah pada model yang telah dirancang:

4.2.1 Masukan Pattern

Pada tahap ini pengguna memasukkan karakter dengan jumlah minimal dua karakter dan jumlah pukulan dengan tujuan untuk menentukan penempatan awal jatuhnya *shuttlecock*. Pada tahap ini pengguna memasukkan beberapa karakter contohnya user memasukkan tiga karakter “F, C dan H”. kemudian user memasukkan jumlah pukulan yang dijadikan prediksi.

Pseudocode masukan pada program	
2	Pukulan = 3
3	Pattern = c("B", "B", "B")
4	Prefix = KMP_prefix(pattern)
5	tampilHasil = list()
6	indeks = 1
7	for(i in 1:nrow(MyData)) {
8	teks = c()
9	for(j in 1:col(MyData)) {
10	teks = c(teks, toString(MyData[i,j]))
11	}

Gambar 4.5 Potongan Code Masukan pada program

Gambar 4.5 merupakan potongan *code* masukan pengguna. Pada baris ke 81 menjelaskan bahwa pengguna memasukkan jumlah pukulan sebanyak 3 pukulan yang menentukan karakter apa saja setelah karakter masukkan. Selanjutnya pada baris 82 menjelaskan masukan *user* terhadap pola penempatan jatuhnya *shuttlecock* yang bertujuan untuk menyusun strategi penempatan jatuhnya *shuttlecock*, setelah itu melakukan pencarian nilai *prefix*. *Prefix* itu sendiri adalah derajat pengulangan karakter yang akan dapat menentukan karakter yang tidak perlu dicocokkan kembali. Setelah melakukan pencarian nilai *prefix*, pada baris 84 menampilkan kumpulan karakter setelah karakter yang dimasukkan oleh *user*.

4.2.2 String Matching Algoritma Knuth-Morris-Pratt

Setelah pengguna memasukan karakter dan jumlah pukulan, pada tahap ini algoritma Knuth-Morris-Pratt mencari karakter yang telah dimasukkan oleh user.

Sehingga didapatkan hasil secara menyeluruh karakter-karakter setelah karakter yang dimasukkan oleh user dengan berdasarkan jumlah pukulan yang dimasukkan oleh user. Dalam proses pencarian dengan algoritma Knuth-Morris-Pratt, algoritma Knuth-Morris-Pratt mencari karakter-karakter yang telah dimasukkan oleh pengguna dengan berdasarkan banyaknya jumlah pukulan. Misalnya, pengguna memasukkan dua karakter penempatan *Shuttlecock* dan jenis pukulan "D,2","B,4", algoritma Knuth-Morris-Pratt akan mencari karakter dari data yang telah ditransformasikan ke bentuk "CSV" dimana karakter yang dicari adalah karakter setelah "D,2","B,4". Jika algoritma Knuth-Morris-Pratt menemukan karakter yang dicari, maka didapatkan karakter-karakter setelah masuknya pengguna ("D,2","B,4"). Pada contoh disini penulis telah melakukan uji coba dimana hasil pencarian karakter sebagai berikut, "B,4" "H,3" "I,3", "F,3" "D,3" "F,2", "B,2" "H,3" "F,3". Karakter-karakter tersebut merupakan karakter-karakter yang akan dijadikan prediksi. Namun, apabila algoritma Knuth-Morris-Pratt tidak menemukan hasil pencarian maka, tidak ada karakter yang akan dijadikan prediksi.

4.2.3 Alternatif

Pada tahap ini karakter yang telah diproses oleh algoritma Knuth-Morris-Pratt akan dijadikan karakter-karakter prediksi. Untuk menentukan hasil prediksi, terdapat empat kemungkinan:

1. Tidak menemukan hasil pencarian, tidak ada karakter yang akan dijadikan prediksi penempatan *shuttlecock*.
2. Ditemukan hanya satu string, setelah algoritma Knuth-Morris-Pratt hanya menemukan satu string, string tersebut merupakan string yang akan dijadikan prediksi.
3. Ditemukan dua string, system akan mencari satu string berdasarkan dua string yang ditemukan dengan cara mengacak (*Random*). Fungsi random dengan menggunakan fungsi ROUND(RUNIF) yaitu mengambil secara acak index dari setiap string kemudian memanggil kembali string dengan index yang sudah di random.
4. Ditemukan ≥ 3 string, system akan melakukan pengelompokan (clustering) dimana hasil pengelompokan tersebut akan menghasilkan satu string.

Pada keempat kemungkinan tersebut akan menghasilkan satu string saja. Hasil string akan dijasikan prediksi penempatan *Shuttlecock*. Setelah didapatkan hasil prediksi, hasil prediksi akan dicocokkan dengan data video yang telah ditransformasikna kebentuk “CSV”.

4.2.4 Clustering

String yang dihasilkan dari proses Knuth-Morris-Pratt selanjutnya dimasukan kedalam proses *clustering*. pada proses clustering, masukan dari hasil pencarian dengan Knuth-Morris-Pratt akan dicari kumpulan titik-titik custer, setelah didapatkan pembagian cluster dari setiap cluster diambil titik pusan cluster untuk dijadikan *output* dari program.

4.3. Pengembangan Perangkat Lunak

Pada tahap pengembangan perangkat lunak, dilakukan implementasi algoritma Knuth-Morris-Pratt pada Bahasa pemrograman R dengan model yang telah dirancang pada subbab 4.2 Perancangan Model. Pengembangan perangkat lunak akan dijelaskan ke dalam beberapa sub subbab berdasarkan metode *waterfall*.

4.3.1 Analisis

Program strategi penempatan *shuttlecock* yang akan dikembangkan adalah program untuk pencarian penempatan *shuttlecock*. Program ini dijalankan dengan menggunakan bahasa pemrograman R, algoritma yang digunakan untuk mencari *pattern* dan *string* adalah algoritma Knuth-Morris-Pratt.

Data yang digunakan sebagai objek program ini adalah data yang telah dijelaskan pada subbab 4.1 pengumpulan data serta alat yang digunakan adalah alat yang telah disebutkan pada subbab 3.2 Alat dan Bahan Penelitian.

4.3.2 Desain

Program ini dibuat berdasarkan gWidgets yang dapat digunakan pengguna. Fungsi-fungsi yang ada akan dibuat menyesuaikan dengan perancangan model yang telah dibangun pada subbab 4.2. Perancangan model. Dalam program ini pun memiliki batasan-batasan tertentu diantaranya adalah sebagai berikut.

1. Karena menggunakan algoritma Knuth-Morris-Pratt, minimal jumlah karakter *pattern* yang dicari adalah sebanyak dua.

2. Karena data yang digunakan, maka disarankan komputer yang digunakan untuk melakukan eksperimen harus memiliki spesifikasi kelas menengah.
3. Karena program ini sebatas eksekusi kode program yang telah dibuat, maka tampilan dari program ini hanya sebatas pada *terminal/prompt*.

4.3.3 Implementasi

Program ini ditulis menggunakan bahasa pemrograman R dengan telah mempersiapkan bahasa R yang sebelumnya ter-*install*.

4.3.3.1 Pembentukan Prefix

Setelah mendapatkan string, langkah selanjutnya adalah membentuk prefix dari pattern yang telah dimasukkan oleh pengguna. Prefix ini digunakan dalam pencarian menggunakan algoritma Knuth-Morris-Pratt seperti yang telah dijelaskan pada subbab Algoritma Knuth-Morris-Pratt. Pada tahap ini penulis membuat fungsi yang mengimplementasikan algoritma pembentukan prefix seperti berikut.

```
#KMP Prefix Function -----
#Fungsi untuk memberikan nilai prefix dalam algoritma utama KMP
KMP_Prefix <- function(pattern){
  #inisiasi variabel
  n_pattern <- length(pattern)
  prefix <- c(0)
  a <- 0
  #pembentukan pattern
  for(b in 2:n_pattern){
    while(a > 0 && pattern[a+1] != pattern[b]){
      a <- prefix[a]
    }
    if(pattern[a+1] == pattern[b]){
      a <- a+1
    }
    prefix[b] <- a
  }
  #Melempar hasil prefix
  return(prefix)
}
```

Masukkan dari pengguna adalah pattern yang mana fungsi yang dibuat akan menghasilkan prefix yang berisi angka. Contoh jika pattern adalah 'ABAA' maka fungsi diatas akan menghasilkan '0011' yang akan digunakan pada fungsi pencarian utama menggunakan algoritma Knuth-Morris-Pratt.

4.3.3.2 Pencarian dengan Algoritma Knuth-morris-Pratt

Masukkan dari fungsi ini adalah pattern dan prefix yang akan menghasilkan list berupa index ditemukanya pattern pada string. Implementasi dari fungsi ini adalah sebagai berikut.

```
KMP <- function(prefix, text, pattern, tampungan){
  i=1
  j=1
  k=1
  returnval=NULL #array untuk menyimpan tiap patern yang sama di dalam teks
  n=length(text)
  m=length(pattern)
  ditemukan = 0

  potong=(text[k:(k+m-1)]) #cek pattern sebelumnya

  #mencari pattern yang paling awal
  if(all(potong==pattern)){
    returnval=append(returnval,k)
  }
  while ((n-k)>=m && ditemukan == 0){
    while (j<m && text[i]==pattern[j]){
      i=i+1
      j=j+1
    }
    if (j>m) ditemukan = 0
    if (j==1) j=2

    if (prefix[j-1]>0){
      k=i-prefix[j-1]
    }else{
      if (i==k) i=i+1
      k=i
    }
    if (j>1) j=prefix[j-1]+1
    potong=(text[k:(k+m-1)]) #cek pattern sebelumnya

    if(all(potong==pattern)){
      returnval=append(returnval,k)
    }
  }
  return(returnval+m)
}
```

4.3.3.3. Hasil Pencarian

Setelah mendapatkan hasil dari pencarian, tahap selanjutnya adalah menyimpan kumpulan hasil pencarian kemudian dilakukan perbandingan tiap kolom untuk mencari karakter terbanyak. Implementasi dari fungsi ini adalah sebagai berikut.

```
kumpulanpattern <- function(pattern, MyData){
  prefix1=KMP_Prefix(pattern)
  hasilCekPattern = cekpattern(pattern)
```

```

tampHasil = list()
indeks = 1

for(i in 1:nrow(MyData)){
  #Convert Integer to String and Put to variable teks
  teks = c()
  teksOri = c()
  if(hasilCekPattern == 0){
    for(j in 1:ncol(MyData)){
      teks = c(teks, toString(MyData[i,j]))
      teks = buangSpasi(teks)
    }
  }else{
    for(j in 1:ncol(MyData)){
      teks = c(teks, toString(MyData[i,j]))
      teksOri = c(teksOri, toString(MyData[i,j]))
      teks = buangSpasi(teks)
      teks = buangKoma(teks)
    }
  }

  #KMP Process
  hasil = KMP(prefix1, teks, pattern, tampungan = c())

  if(length(hasil) != 0){
    nextChar = c()
    if(hasilCekPattern==0){
      for(k in hasil:(hasil+(pukulan-1))){
        nextChar = c(nextChar,teks[k])
      }
    }else{
      for(k in hasil:(hasil+(pukulan-1))){
        nextChar = c(nextChar,teksOri[k])
      }
    }
    tampHasil[[indeks]] = nextChar #karakter setelah pattern
    indeks = indeks+1
  }
  #print(tampHasil)
}
return(tampHasil)
}

```

4.3.3.4. Menggabungkan Setiap String

Setelah merubah variabel dan menghapus karakter setiap string, langkah selanjutnya adalah menggabungkan setiap string menjadi satu untuk mencari jumlah karakter yang paling banyak. Implementasi dari fungsi ini adalah sebagai berikut.

```

stringpembanding = c()
for(i in 1:length(tampHasil)){
  stringpembanding=c(stringpembanding,tampHasil[[i]])
}

```

4.3.4 Pengujian Program

Tabel 4.4 Pengujian Program

No	Item Uji	Hasil yang Diharapkan	Hasil Nyata	Hasil Pengujian
1	<i>Input</i> jumlah pukulan berupa String	Error bahwa masukkan berbentuk angka	Mengeluarkan "ERROR! Inputan tidak berupa integer"	Berhasil
2	<i>Input</i> pukulan ≤ 0	Error bahwa masukkan tidak boleh ≤ 0	"ERROR! Masukan tidak boleh tidak boleh kurang dari atau sama dengan nol"	Berhasil
3	<i>Inputan string pattern</i> tidak sesuai	Error bahwa masukkan <i>pattern</i> tidak sesuai	"Input pattern tidak sesuai. Coba lagi"	Berhasil
4	Inputan <i>pattern</i> sesuai dan jumlah next pukulan ≥ 0	Menampilka <i>pattern</i> dan jumlah next pukulan	Menampilka <i>pattern</i> dan jumlah next pukulan	Berhasil

Pada tabel 4.4 pengujian program dilakukan dengan mencoba beberapa nilai variabel yang salah (tidak tepat) pada nilai jumlah masukkan pukulan dan string. Pengujian pertama memasukkan jumlah pukulan berupa karakter dan akan memunculkan error "Error bahwa masukkan berbentuk angka". Kemudian pada pengujian kedua memasukkan jumlah pukulan kurang dari atau sama dengan nol dan akan memunculkan error "ERROR! Masukan tidak boleh tidak boleh atau sama dengan nol". Pada pengujian ketiga memasukan contoh yang tidak sesuai dengan syarat pada program dan akan mengasilkan "input pattern tidak sesuai. Coba lagi". Pada pengujian terakhir masukan input pukulan dan pattern yang sesuai syarat pada program dan akan menghasilkan prediksi yang diharapkan.

4.4 Desain Eksperimen

4.4.1 Data Video

Pada penelitian ini data yang dipakai adalah data video yang diambil dari Youtube dengan tautan www.youtube.com jumlah video yang dipakai sebanyak 20 video yang dapat dilihat pada table 4.1. untuk mempermudah pengambilan data, data video ditransformasikan ke bentuk “*.CSV”. data yang telah ditransformasikan ke bentuk “*.CSV” diimport menjadi *database* dalam program.

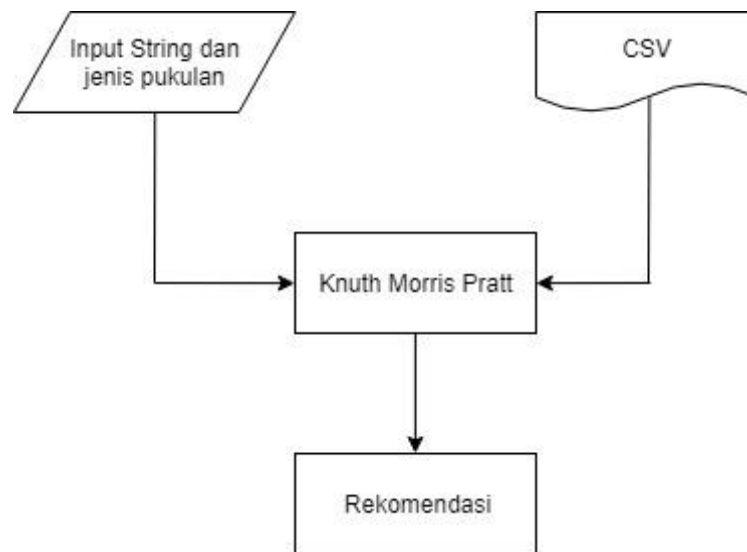
Tabel 4.5 Skenario Penempatan Shuttlecock

	P1	P2	P1	P2	P1	P2	P1	P2	P1	P2	P1	P2	P1	P2	P1
1	E,2	B,2	A,3	C,4	D,2	A,1	G,2	I,2	F,3	D,4	D,2	C,3			
2		E,3	B,3	B,3	H,2	E,2	F,3	G,1	D,3						
3		C,2	E,1	E,2	E,2	A,2	F,4	G,3	B,4	B,2					
4	B,2	A,3	C,4	H,2	E,2	F,3	F,3	G,1	D,3	E,3	B,3	B,3	H,2		
5	B,2	A,3	A,1	G,2	I,2	F,3	E,2	F,3	G,1						
6	C,2	E,1	E,2	E,2	H,2	E,2	F,3								
7		G,2	I,2	F,3	A,3	C,4	H,2	E,2	F,3						
8	H,2	E,2	F,3	G,1	D,3	E,2	B,2	A,3	C,4	D,2					
9	D,3	E,3	B,3	B,3	H,2	H,2	E,2	F,3	F,3	G,1					

Pada Tabel 4.5 Skenario penempatan *shuttlecock*, terdapat karakter-karakter dan angka-angka yang menggambarkan penempatan *Shuttlecock* dan jenis pukulanya. Contohnya pada baris 1 setiap kolom P1 terdapat karakter “E,2”, “A,3”, “D,2”, “G,2”, “F,3” dan “D,2” merupakan karakter-karakter dan angka penempatan shuttlecock yang dilakukan pada pemain 1. Karakter tersebut merupakan penempatan *Shuttlecock* yang dilakukan paemain 1 dan angka menunjukkan jenis pukulan yang dilakukan pemain 1. Begitupun pada setiap kolom P2 terdapat karakter “B,2”, “C,4”, “A,1”, “I,2”, “D,4” dan “C,3” merupakan karakter-karakter dan angka penempatan shuttlecock yang dilakukan pada pemain 2. Karakter tersebut merupakan penempatan *Shuttlecock* yang dilakukan paemain 2 dan angka menunjukkan jenis pukulan yang dilakukan pemain 2. Dari setiap baris dihasilkan setiap satu poin dalam permainan, yang artinya ketika permainan berhenti maka pencatatan akan pindah pada baris selanjutnya. Pada baris 2, 3 dan 7 menunjukkan pukulan awal yang dilakukan oleh pemain 2 dan pada baris 1, 4, 5, 6, 8 dan 9

menunjukkan pukulan awal yang dilakukan oleh pemain 1. Panjang rally permainan dari setiap baris terdapat 42 dan rally terpendek dari setiap baris terdapat 6 rally. Dari data “*.CSV” terdapat 980 baris data karakter dan angka penempatan shuttlecock dengan rally terpanjang adalah 42. Data selengkapnya dapat dilihat pada lampiran 2.

4.4.2 Skenario Eksperimen



Gambar 4.6 Skenario Eksperimen

Pada gambar 4.7 menggambarkan desain eksperimen pada penelitian ini. Eksperimen dalam penelitian ini, terdapat dua skenario eksperimen yang akan dipaparkan pada subbab ini. Berikut penjelasan kedua skenario:

1. Skenario ke-1

Pada skenario ke-1 dilakukan pengambilan 1 video dari 20 video yang tersedia sebagai data training. Dari satu video tersebut diambil sebanyak seratus string untuk dijadikan masukan pada program. Masing-masing string dengan panjang yang berbeda, yaitu: dua puluh string dengan dengan panjang dua karakter, dua puluh string dengan dengan panjang tiga karakter, dua puluh string dengan dengan panjang lima karakter, dua puluh string dengan dengan panjang tujuh karakter dan dua puluh string dengan dengan panjang sembilan karakter. Tujuan pengambilan satu video ini adalah untuk menguji algoritma Knuth-morris-Pratt

dalam sistem pada penelitian ini. Data video ditransformasikan ke bentuk data “*.CSV” untuk mempermudah proses uji algoritma. Setelah itu dilakukan masukan berupa karakter dan jenis pukulan yang dimasukkan oleh pengguna dalam program. Berikut contoh-contoh masukan dari pengguna:

Tabel 4.6 Skenario Pertama

Jumlah Panjang String	Banyaknya Percobaan
2	20 Percobaan
3	20 Percobaan
5	20 Percobaan
7	20 Percobaan
9	20 Percobaan

Pada table 4.6 menunjukkan tabel pada skenario pertama yaitu string dengan Panjang dua karakter memiliki dua puluh percobaan, string dengan Panjang tiga karakter memiliki dua puluh percobaan, string dengan Panjang lima karakter memiliki dua puluh percobaan, string dengan Panjang tujuh karakter memiliki dua puluh percobaan dan string dengan Panjang sembilan karakter memiliki dua puluh percobaan. Hasil dari percobaan tersebut dipaparkan pada sub bab 4.5.1.

2. Skenario 2

Pada skenario kedua, dari data dua puluh video yang tersedia diambil satu video untuk dijadikan masukan pada program. Dari satu video tersebut diambil seratus string. Dua puluh string dengan Panjang dua karakter, dua puluh string dengan Panjang tiga karakter, dua puluh string dengan Panjang lima karakter, dua puluh string dengan Panjang tujuh karakter dan dua puluh string dengan Panjang Sembilan karakter. Dari lima puluh string tersebut akan dijalankan pada program dengan data tes dengan Sembilan belas video. Langkah selanjutnya adalah menjalankan program sama seperti halnya pada skenario pertama. hasil

Tabel 4.7 Skenario Kedua

Jumlah Panjang String	Banyaknya Percobaan
2	20 Percobaan
3	20 Percobaan
5	20 Percobaan
7	20 Percobaan
9	20 Percobaan

Pada table 4.7 menunjukkan tabel pada scenario pertama yaitu string dengan Panjang dua karakter memiliki dua puluh percobaan, string dengan Panjang tiga karakter memiliki dua puluh percobaan, string dengan Panjang lima karakter memiliki dua puluh percobaan, string dengan Panjang tujuh karakter memiliki dua puluh percobaan dan string dengan Panjang sembilan karakter memiliki dua puluh percobaan. Hasil dari percobaan tersebut dipaparkan pada sub bab 4.5.2.

4.5 Hasil Eksperimen

Setelah melakukan dua scenario eksperimen, penulis mendapatkan hasil yang akan dipaparkan pada subsubbab berikut.

4.5.1 Hasil Eksperimen Skenario 1

Pada eksperimen skenario 1, diambil salah satu data dari dua puluh video yang diuji dan digambarkan dalam bentuk tabel 4.9

Pada tabel 4.9 kolom input pukulan dan jumlah next pukulan digunakan sebagai masukan pada program yang dibuat. Sementara pada kolom tamphasil merupakan kumpulan-kumpulan string atau pattern yang dijadikan acuan dari hasil output program. Sedangkan pada kolom prediksi merupakan output yang dihasilkan dari program yang dijalankan menggunakan masukan yang berasal dari kolom input pukulan dan kolom jumlah next pukulan. Terakhir, kolom hasil aktual video adalah string atau pattern yang merupakan lanjutan string atau pattern pada kolom input pukulan berdasarkan data yang diambil.

Pada data tabel 4.9 baris kedua terdapat beberapa kumpulan string atau pattern yang dijadikan acuan sebagai tamphasil, hal ini disebabkan oleh banyaknya string yang awali dengan pattern “E,2, H,2” pada data yang diambil. Dan pada

kolom prediksi terlihat bahwa salah satu string yaitu "B,2" "A,4" "C,4" terdapat juga pada kolom tamphasil. Hal ini menunjukkan bahwa prediksi yang dihasilkan oleh program yang dijalankan dengan skenario pertama mendapatkan hasil yang akurat.

Tabel 4.8 Hasil Eksperimen Skenario Pertama

No	Input Pukulan	Jumlah Next Pukulan	TampHasil	Prediksi	Hasil Aktual Video
1	"E,1","G,2"	3	"H,2" "G,2" "H,2"	"H,2" "G,2" "H,2"	"H,2" "G,2" "H,2"
2	"E,2","H,2"	3	"B,2" "A,4" "C,4" "A,2" "A,4" "G,2" "B,4" "B,4" "H,3" "C,4" "D,2" "F,2"	"B,2" "A,4" "C,4"	"B,2" "A,4" "C,4"
3	"B,2","H,3","H,2"	4	"G,2" "E,2" "H,2" "A,2" "G,3" "E,2" "E,3" "G,3"	"G,2" "E,2" "H,2" "A,2"	"G,2" "E,2" "H,2" "A,2"
4	"D,2","B,2","C,2"	3	"I,3" "C,4" "G,3"	"I,3" "C,4" "G,3"	"I,3" "C,4" "G,3"
5	"I,3","A,2"	4	"G,3" "H,2" "" "" "G,3" "A,2" "C,2" "I,2" "C,2" "G,3" "I,1" "" "I,3" "A,2" "B,4" "B,2" "E,3" "" "" ""	"G,3" "A,2" "C,2" "I,2"	"G,3" "A,2" "C,2" "I,2"
6	"E,2","I,3","D,2"	6	"B,4" "B,2" "H,3" "F,3" "A,2" "I,3"	"B,4" "B,2" "H,3" "F,3" "A,2" "I,3"	"B,4" "B,2" "H,3" "F,3" "A,2" "I,3"
7	"E,2","E,2","A,4","E,2","E,2"	5	"C,4" "B,4" "A,4" "G,3" "F,2"	"C,4" "B,4" "A,4" "G,3" "F,2"	"C,4" "B,4" "A,4" "G,3" "F,2"
8	"E,2","G,3","A,2","C,2","I,3", "G,3","I,3"	7	"I,1" "A,2" "G,3" "G,2" "B,4" "B,2" "H,3"	"I,1" "A,2" "G,3" "G,2" "B,4" "B,2" "H,3"	"I,1" "A,2" "G,3" "G,2" "B,4"

No	Input Pukulan	Jumlah Next Pukulan	TampHasil	Prediksi	Hasil Aktual Video
					"B,2" "H,3"
9	"B,2","F,3","G,3","A,2","I,3", "D,2","H,3","G,3","I,3"	9	"I,3" "F,2" "I,3" "A,2" "I,3" "A,2" "B,4" "B,2" "H,3"	"I,3" "F,2" "I,3" "A,2" "I,3" "A,2" "B,4" "B,2" "H,3"	"I,3" "F,2" "I,3" "A,2" "I,3" "A,2" "B,4" "B,2" "H,3"
10	"G,3","I,3","I,2","B,4","B,2", "G,2","D,2","A,2","G,3"	9	"C,2" "I,3" "I,3" "G,3" "I,1" "A,4" "A,4" "I,3" "I,3"	"C,2" "I,3" "I,3" "G,3" "I,1" "A,4" "A,4" "I,3" "I,3"	"C,2" "I,3" "I,3" "G,3" "I,1" "A,4" "A,4" "I,3" "I,3"
11	"B,2","I,3","C,2","I,3","I,2"	7	"F,2" "D,3" "E,3" "B,2" "H,1" "F,2" "C,4"	"F,2" "D,3" "E,3" "B,2" "H,1" "F,2" "C,4"	"F,2" "D,3" "E,3" "B,2" "H,1" "F,2" "C,4"
12	"I,3","F,2","E,3","G,3","I,3", "H,1","A,4"	5	"C,2" "I,3" "G,2" "C,4" "A,2"	"C,2" "I,3" "G,2" "C,4" "A,2"	"C,2" "I,3" "G,2" "C,4" "A,2"
13	"F,3","D,3","C,4","A,4","I,3", "G,3","A,2","I,1","A,2"	7	"I,1" "A,4" "C,2" "I,3" "H,3" "F,2" "I,3"	"I,1" "A,4" "C,2" "I,3" "H,3" "F,2" "I,3"	"I,1" "A,4" "C,2" "I,3" "H,3" "F,2" "I,3"
14	"E,2","B,4","D,3","A,2","H,2", "I,3","C,4"	9	"A,2" "I,3" "G,3" "C,2" "I,3" "D,2" "F,3" "C,2" "G,3"	"A,2" "I,3" "G,3" "C,2" "I,3" "D,2" "F,3" "C,2" "G,3"	"A,2" "I,3" "G,3" "C,2" "I,3" "D,2" "F,3" "C,2" "G,3"
15	"E,2","G,1","E,2","F,1","E,2"	5	"F,1" "D,2" "C,4" "A,2" "G,1"	"F,1" "D,2" "C,4" "A,2" "G,1"	"F,1" "D,2" "C,4" "A,2" "G,1"
16	"E,1","E,1"	3	"B,2" "H,2" "A,1"	"B,2" "H,2" "A,1"	"B,2" "H,2" "A,1"

No	Input Pukulan	Jumlah Next Pukulan	TampHasil	Prediksi	Hasil Aktual Video
17	"D,2","G,1"	3	"D,1" "G,2" "G,2" "C,2" "" ""	"D,1" "G,2" "G,2"	"D,1" "G,2" "G,2"
18	"C,2","B,4"	3	"F,2" "A,4" "D,2"	"F,2" "A,4" "D,2"	"F,2" "A,4" "D,2"
19	C,2","G,2"	3	"D,2" "B,2" "A,2 "H,3" "H,2" ""	"D,2" "B,2" "A,2"	"D,2" "B,2" "A,2"
20	"B,4","H,2"	3	"B,2" "H,2" "D,2" "" "" ""	"B,2" "H,2" "D,2"	"B,2" "H,2" "D,2"
21	"G,2","H,3"	3	"E,2" "A,4" "C,2" "H,2" "" ""	"E,2" "A,4" "C,2"	"E,2" "A,4" "C,2"
22	"C,4","D,2"	3	"F,2" "E,2" "A,2" "B,2" "C,2" "I,3"	"F,2" "E,2" "A,2"	"F,2" "E,2" "A,2"
23	"B,4","G,3","D,2"	4	"B,4" "B,4" "H,3" "I,3"	"B,4" "B,4" "H,3" "I,3"	"B,4" "B,4" "H,3" "I,3"
24	E,2","D,2","I,1"	4	"D,2" "A,4" "E,2" "H,3"	"D,2" "A,4" "E,2" "H,3"	"D,2" "A,4" "E,2" "H,3"
25	"G,1","B,2","B,2"	4	"G,3" "I,3" "B,2" "F,2"	"G,3" "I,3" "B,2" "F,2"	"G,3" "I,3" "B,2" "F,2"
26	"E,2","H,2","C,4"	4	"D,2" "F,2" "E,2" "A,2"	"D,2" "F,2" "E,2" "A,2"	"D,2" "F,2" "E,2" "A,2"
27	"E,2","G,3","H,2"	4	"A,2" "G,3" "A,2" "I,3" "C,4" "A,2" "I,3" "H,1"	"A,2" "G,3" "A,2" "I,3"	"A,2" "G,3" "A,2" "I,3"
28	"E,2","D,2","I,1"	4	"D,2" "A,4" "E,2" "H,3"	"D,2" "A,4" "E,2" "H,3"	"D,2" "A,4" "E,2" "H,3"
29	"E,2","B,2","I,3"	4	"I,3" "F,2" "E,3" "E,2" "C,2" "I,3" "I,2" "F,2" "D,2" "" "" ""	"I,3" "F,2" "E,3" "E,2"	"I,3" "F,2" "E,3" "E,2"

No	Input Pukulan	Jumlah Next Pukulan	TampHasil	Prediksi	Hasil Aktual Video
			"C,2" "G,3" "" ""		
30	"E,2", "B,2", "I,3", "I,3", "F,2"	3	"E,3" "E,2" "B,3"	"E,3" "E,2" "B,3"	"E,3" "E,2" "B,3"
31	"E,2", "A,2", "G,3", "F,2", "B,2"	3	"H,3" "F,2" "D,3"	"H,3" "F,2" "D,3"	"H,3" "F,2" "D,3"
32	"E,2", "D,2", "C,2", "I,1", "A,4"	3	"C,3" "I,3" "B,2"	"C,3" "I,3" "B,2"	"C,3" "I,3" "B,2"
33	"G,3", "C,2", "H,3", "E,2", "F,3"	3	"D,2" "F,2" "A,4"	"D,2" "F,2" "A,4"	"D,2" "F,2" "A,4"
34	B,2", "H,3", "F,3", "A,2", "I,3"	3	"G,2" "A,2" "C,2"	"G,2" "A,2" "C,2"	"G,2" "A,2" "C,2"
35	"E,2", "G,3", "C,2", "H,3", "E,2"	3	"F,3" "D,2" "F,2"	"F,3" "D,2" "F,2"	"F,3" "D,2" "F,2"
36	B,2", "H,3", "H,2", "G,3", "E,2"	3	"E,3" "G,3" "D,2"	"E,3" "G,3" "D,2"	"E,3" "G,3" "D,2"
37	"H,2", "E,2", "A,4", "F,2", "A,4", "B,2", "H,3"	5	"E,2" "A,4" "H,3" "H,3" "A,2"	"E,2" "A,4" "H,3" "H,3" "A,2"	"E,2" "A,4" "H,3" "H,3" "A,2"
38	"G,3", "F,3", "H,3", "F,2", "A,4", "C,4", "I,2"	5	"D,2" "C,4" "A,4" "B,4" "C,4"	"D,2" "C,4" "A,4" "B,4" "C,4"	"D,2" "C,4" "A,4" "B,4" "C,4"
39	H,3", "G,3", "I,2", "C,2", "G,2", "D,2", "B,2"	5	"A,2" "A,2" "G,3" "C,2" "G,3"	"A,2" "A,2" "G,3" "C,2" "G,3"	"A,2" "A,2" "G,3" "C,2" "G,3"
40	"E,2", "B,4", "C,4", "A,2", "H,3", "F,2", "C,2"	5	F,3" "A,4" "A,2" "F,3" "H,1"	F,3" "A,4" "A,2" "F,3" "H,1"	F,3" "A,4" "A,2" "F,3" "H,1"
41	"E,2", "G,3", "G,3", "A,4", "C,2", "I,3", "I,1"	5	A,4" "C,4" "A,4" "C,2" "G,3"	A,4" "C,4" "A,4" "C,2" "G,3"	A,4" "C,4" "A,4" "C,2" "G,3"
42	"I,3", "E,3", "A,2", "G,1", "C,4", "A,4", "I,3"	5	"G,2" "A,4" "C,4" "G,3" "H,1"	"G,2" "A,4" "C,4" "G,3" "H,1"	"G,2" "A,4" "C,4" "G,3" "H,1"
43	"E,2", "B,2", "I,3", "I,3", "F,2", "E,3", "E,2"	5	"B,3" "E,3" "I,3" "E,1" "D,2"	"B,3" "E,3" "I,3" "E,1" "D,2"	"B,3" "E,3" "I,3" "E,1" "D,2"

No	Input Pukulan	Jumlah Next Pukulan	TampHasil	Prediksi	Hasil Aktual Video
44	"I,3","F,2","I,3","A,2","I,3" ,"A,2","B,4","B,2","H,3"	8	"H,2" "G,3" "E,2" "E,3" "G,3" "D,2" "I,3" "I,3"	"H,2" "G,3" "E,2" "E,3" "G,3" "D,2" "I,3" "I,3"	"H,2" "G,3" "E,2" "E,3" "G,3" "D,2" "I,3" "I,3"
45	"C,2","I,3","I,3","G,3","I,1" ,"A,4","A,4","I,3","I,3"	6	"F,3" "D,2" "A,4" "C,4" "F,3" "G,4"	"F,3" "D,2" "A,4" "C,4" "F,3" "G,4"	"F,3" "D,2" "A,4" "C,4" "F,3" "G,4"
46	"E,2","B,2","I,3","I,3","F,2" ,"E,3","E,2","B,3","E,3"	8	"I,3" "E,1" "D,2" "A,4" "C,3" "I,3" "I,3" "I,3"	"I,3" "E,1" "D,2" "A,4" "C,3" "I,3" "I,3" "I,3"	"I,3" "E,1" "D,2" "A,4" "C,3" "I,3" "I,3" "I,3"
47	"E,3","G,3","I,3","H,1","A,4" ,"C,2","I,3","G,2","C,4"	8	"A,2" "I,3" "G,3" "C,4" "A,2" "I,1" "D,2" "C,1"	"A,2" "I,3" "G,3" "C,4" "A,2" "I,1" "D,2" "C,1"	"A,2" "I,3" "G,3" "C,4" "A,2" "I,1" "D,2" "C,1"
48	"A,2","I,1","A,2","I,1","A,4" ,"C,2","I,3","H,3","F,2"	8	"I,3" "G,3" "G,3" "I,3" "G,3" "C,2" "G,3" "D,1"	"I,3" "G,3" "G,3" "I,3" "G,3" "C,2" "G,3" "D,1"	"I,3" "G,3" "G,3" "I,3" "G,3" "C,2" "G,3" "D,1"
49	"E,2","B,2","G,3","D,3","I,3" ,"C,2","I,3","D,2","A,2"	7	"D,3" "G,3" "D,2" "C,2" "I,3" "G,3" "A,4"	"D,3" "G,3" "D,2" "C,2" "I,3" "G,3" "A,4"	"D,3" "G,3" "D,2" "C,2" "I,3" "G,3" "A,4"
50	"E,2","B,2","I,3","I,3","F,2" ,"E,3","E,2","B,3","E,3"	8	"I,3" "E,1" "D,2" "A,4" "C,3" "I,3" "I,3" "I,3"	"I,3" "E,1" "D,2" "A,4" "C,3" "I,3" "I,3" "I,3"	"I,3" "E,1" "D,2" "A,4" "C,3" "I,3" "I,3" "I,3"
51	"B,1","F,2","F,2"	3	"I,2" "H,2" "F,2"	"I,2" "H,2" "F,2"	"I,2" "H,2" "F,2"
52	"E,1","D,2","G,1"	3	"D,1" "G,2" "G,2"	"D,1" "G,2" "G,2"	"D,1" "G,2" "G,2"
53	"E,1","G,2","H,2"	3	"G,2" "H,2" "F,2"	"G,2" "H,2" "F,2"	"G,2" "H,2" "F,2"

No	Input Pukulan	Jumlah Next Pukulan	TampHasil	Prediksi	Hasil Aktual Video
54	"C,2","G,2","D,2"	3	"B,2" "A,2" "A,2"	"B,2" "A,2" "A,2"	"B,2" "A,2" "A,2"
55	"E,1","B,2","G,3"	3	"B,2" "A,2" "E,2"	"B,2" "A,2" "E,2"	"B,2" "A,2" "E,2"
56	"D,2","H,3","I,2"	3	"C,4" "G,2" "C,2"	"C,4" "G,2" "C,2"	"C,4" "G,2" "C,2"
57	"E,1","C,2","A,4"	3	"G,2" "A,4" "C,4"	"G,2" "A,4" "C,4"	"G,2" "A,4" "C,4"
58	"E,2","H,2","A,2"	3	"A,4" "G,2" "H,2"	"A,4" "G,2" "H,2"	"A,4" "G,2" "H,2"
59	"A,2","I,3","A,2"	3	"G,3" "A,2" "C,2" "B,4" "B,2" "H,3" "E,3" "" ""	"G,3" "A,2" "C,2"	"B,4" "B,2" "H,3"
60	"I,3","I,3","G,3"	3	"A,2" "" "" "A,4" "" "" "I,1" "A,4" "A,4"	"I,1" "A,4" "A,4"	"I,1" "A,4" "A,4"
61	"A,2","G,3","F,2","B,2","H,3"	4	"F,2" "D,3" "A,3" "G,3"	"F,2" "D,3" "A,3" "G,3"	"F,2" "D,3" "A,3" "G,3"
62	"B,2","G,3","D,3","I,3","C,2"	4	"I,3" "D,2" "A,2" "D,3"	"I,3" "D,2" "A,2" "D,3"	"I,3" "D,2" "A,2" "D,3"
63	"A,2","H,2","I,3","C,4","A,2"	4	"I,3" "G,3" "C,2" "I,3"	"I,3" "G,3" "C,2" "I,3"	"I,3" "G,3" "C,2" "I,3"
64	"I,1","A,2","I,1","A,4","C,2"	4	"I,3" "H,3" "F,2" "I,3"	"I,3" "H,3" "F,2" "I,3"	"I,3" "H,3" "F,2" "I,3"
65	"E,2","B,2","G,3","D,3","I,3"	4	"C,2" "I,3" "D,2" "A,2"	"C,2" "I,3" "D,2" "A,2"	"C,2" "I,3" "D,2" "A,2"
66	"A,2","G,3","F,2","B,2","H,3"	4	"F,2" "D,3" "A,3" "G,3"	"F,2" "D,3" "A,3" "G,3"	"F,2" "D,3" "A,3" "G,3"
67	"E,2","B,2","I,3","I,3","F,2"	4	"E,3" "E,2" "B,3" "E,3"	"E,3" "E,2" "B,3" "E,3"	"E,3" "E,2" "B,3" "E,3"
67	"E,2","A,2","G,3","F,2","B,2"	4	"H,3" "F,2" "D,3" "A,3"	"H,3" "F,2" "D,3" "A,3"	"H,3" "F,2" "D,3" "A,3"

No	Input Pukulan	Jumlah Next Pukulan	TampHasil	Prediksi	Hasil Aktual Video
68	"G,3","I,1","A,4","A,4","I,3"	4	"I,3" "F,3" "D,2" "A,4"	"I,3" "F,3" "D,2" "A,4"	"I,3" "F,3" "D,2" "A,4"
70	"I,3","A,2","B,4","B,2","H,3"	4	"H,2" "G,3" "E,2" "E,3"	"H,2" "G,3" "E,2" "E,3"	"H,2" "G,3" "E,2" "E,3"
71	"C,2","I,3","I,3","G,3","I,1" ,"A,4","A,4"	3	"I,3" "I,3" "F,3"	"I,3" "I,3" "F,3"	"I,3" "I,3" "F,3"
72	"E,2","D,2","C,2","I,1","A,4" ,"C,3","I,3"	3	"B,2" "I,3" "C,2"	"B,2" "I,3" "C,2"	"B,2" "I,3" "C,2"
73	"E,2","B,4","A,2","G,3","F,2" ,"G,1","C,2"	3	"G,3" "D,2" "I,3"	"G,3" "D,2" "I,3"	"G,3" "D,2" "I,3"
74	"I,3","I,3","F,2","E,3","E,2" ,"B,3","E,3"	3	"I,3" "E,1" "D,2"	"I,3" "E,1" "D,2"	"I,3" "E,1" "D,2"
75	"E,2","A,2","G,3","F,2","B,2" ,"H,3","F,2"	3	"G,3" "E,2" "E,3"	"G,3" "E,2" "E,3"	"G,3" "E,2" "E,3"
76	"I,3","C,2","I,3","I,2","F,2" ,"D,3","E,3"	3	"G,3" "D,2" "I,3"	"G,3" "D,2" "I,3"	"G,3" "D,2" "I,3"
77	"E,2","B,2","I,3","I,3","F,2" ,"E,3","E,2"	3	"B,3" "E,3" "I,3"	"B,3" "E,3" "I,3"	"B,3" "E,3" "I,3"
78	"I,1","A,4","C,2","I,3","H,3" ,"F,2","I,3"	3	"G,3" "G,3" "I,3"	"G,3" "G,3" "I,3"	"G,3" "G,3" "I,3"
79	"E,2","A,4","A,4","C,2","I,3" ,"E,2","B,3"	3	"B,3" "C,4" "A,2"	"B,3" "C,4" "A,2"	"B,3" "C,4" "A,2"
80	"A,2","I,3","A,2","B,4","B,2" ,"H,3","H,2"	3	"G,3" "E,2" "E,3"	"G,3" "E,2" "E,3"	"G,3" "E,2" "E,3"
81	"A,2","I,3","A,2","B,4","B,2" ,"H,3","H,2","G,3","E,3"	3	"H,3" "G,3" "F,2"	"H,3" "G,3" "F,2"	"H,3" "G,3" "F,2"
82	"I,2","B,4","B,2","G,2","D,2" ,"A,2","G,3","C,2","I,3"	3	"I,3" "G,3" "I,1"	"I,3" "G,3" "I,1"	"I,3" "G,3" "I,1"
83	"E,2","B,2","I,3","C,2","I,3" ,"I,2","F,2","D,3","E,3"	3	"B,2" "H,1" "F,2"	"B,2" "H,1" "F,2"	"B,2" "H,1" "F,2"
84	"E,2","G,3","A,2","C,2","I,3" ,"G,3","I,3","I,1","A,2"	3	"G,3" "G,2" "B,4"	"G,3" "G,2" "B,4"	"G,3" "G,2" "B,4"
85	"E,2","B,2","E,3","E,2","I,3" ,"D,2","B,4","B,2","H,3"	3	"F,3" "A,2" "I,3"	"F,3" "A,2" "I,3"	"F,3" "A,2" "I,3"
86	"E,1","D,2","C,4","C,2","B,4" ,"F,2","A,4","D,2","A,4"	3	"C,4" "H,2" "E,2"	"C,4" "H,2" "E,2"	"C,4" "H,2" "E,2"
87	"A,2","I,3","A,2","B,4","B,2" ,"H,3","H,2","G,3","E,3"	3	"I,3" "G,2" "A,2"	"I,3" "G,2" "A,2"	"I,3" "G,2" "A,2"

No	Input Pukulan	Jumlah Next Pukulan	TampHasil	Prediksi	Hasil Aktual Video
88	"B,4","F,2","A,4","D,2","A,4", ,"C,4","H,2","E,2","A,4"	3	"F,2" "A,4" "B,2"	"F,2" "A,4" "B,2"	"F,2" "A,4" "B,2"
89	"E,1","A,2","H,3","G,3","I,2" ,"C,2","G,2","D,2","B,2"	3	"A,2" "A,2" "G,3"	"A,2" "A,2" "G,3"	"A,2" "A,2" "G,3"
90	"E,2","B,2","F,2","C,2","H,3" ,"D,2","F,2","C,2","B,2"	3	"H,3" "H,2" "G,2"	"H,3" "H,2" "G,2"	"H,3" "H,2" "G,2"
91	"A,4","E,2"	4	"H,2" "B,2" "A,4" "C,4" "H,3" "E,2" "B,2" "B,4" "E,2" "C,4" "B,4" "A,4"	"H,2" "B,2" "A,4" "C,4"	"H,3" "E,2" "B,2" "B,4"
92	"E,2","H,2"	4	"B,2" "A,4" "C,4" "A,4" "C,4" "D,2" "F,2" "E,2" "A,2" "A,4" "G,2" "H,2" "B,4" "B,4" "H,3" "F,2"	"B,2" "A,4" "C,4" "A,4"	"C,4" "D,2" "F,2" "E,2"
93	"B,4","B,2"	4	"H,3" "F,3" "A,2" "I,3" "H,3" "F,2" "B,2" "C,2" "H,3" "G,3" "F,2" "B,4" "H,3" "H,2" "G,3" "E,2" "G,2" "D,2" "A,2" "G,3" "A,2" "G,3" "D,2" "F,3"	"H,3" "F,3" "A,2" "I,3"	"H,3" "F,3" "A,2" "I,3"
94	"C,4","A,4"	4	"C,2" "G,3" "I,3" "A,2" "I,3" "G,2" "A,4" "C,4" "C,4" "A,2" "I,3" "I,1"	"C,2" "G,3" "I,3" "A,2"	"C,2" "G,3" "I,3" "A,2"
95	"I,3","G,2"	4	"A,2" "C,2" "H,3" "H,3" "A,4" "C,4" "G,3" "H,1" "C,4" "A,2" "I,3" "G,3"	"A,2" "C,2" "H,3" "H,3"	"A,2" "C,2" "H,3" "H,3"
96	"I,1","A,4"	4	"C,3" "I,3" "B,2" "I,3" "C,4" "A,4" "C,2" "G,3" "C,2" "I,3" "H,3" "F,2"	"C,4" "A,4" "C,2" "G,3"	"C,4" "A,4" "C,2" "G,3"

No	Input Pukulan	Jumlah Next Pukulan	TampHasil	Prediksi	Hasil Aktual Video
			"A,4" "I,3" "I,3" "F,3"		
97	"A,4","G,3"	4	"F,2" "A,2" "I,3" "D,2" "A,2" "G,3" "G,1" "" "I,3" "D,3" "" ""	"F,2" "A,2" "I,3" "D,2"	"F,2" "A,2" "I,3" "D,2"
98	"E,2","B,1"	4	"F,2" "F,2" "I,2" "H,2" "H,3" "H,2" "G,2" "C,2" "D,2" "G,3" "E,2" "A,1"	"D,2" "G,3" "E,2" "A,1"	"D,2" "G,3" "E,2" "A,1"
99	"G,3","C,2"	4	"G,3" "C,4" "F,2" "E,2" "H,3" "E,2" "F,3" "D,2" "I,3" "I,3" "G,3" "I,1" "G,3" "D,1" "A,4" "C,4" "I,3" "D,2" "F,3" "C,2"	"G,3" "C,4" "F,2" "E,2"	"H,3" "E,2" "F,3" "D,2"
100	"E,2","A,4"	4	"C,2" "H,3" "D,2" "" "E,2" "E,2" "C,4" "B,4" "A,4" "C,2" "I,3" "E,2"	"A,4" "C,2" "I,3" "E,2"	"A,4" "C,2" "I,3" "E,2"

4.5.2 Hasil Eksperimen Skenario Kedua

Pada eksperimen skenario 2, diambil satu data video diluar 19 video yang dijasikan sebagai masukan pada skenario kedua dan digambarkan dalam bentuk tabel 4.7 pada baris keempat kolom tamphasil menunjukan hasil yang tidak terdefiniskan, hal ini disebabkan karena dengan contoh masukan string atau pattern yaitu "G,2","E,2","C,2","G,2","D,2","A,4","G,2","I,2","E,3" tidak ada pada data yang digunakan. Sehingga jika masukan string atau pattern tersebut digunakan sebagai masukan pada program akan menghasilkan hasil prediksi menjadi tidak terdefiniskan.

Tabel 4.9 Hasil Eksperimen Skenario Kedua

No	Input Pukulan	Jumlah Next Pukulan	TampHasil	Prediksi	Hasil Aktual Video
1	"D,2","B,4"	3	"B,4" "H,3" "I,3" "F,3" "D,3" "F,2" "B,2" "H,3" "F,3" "C,2" "A,4" "C,4" "I,2" "F,3" "A,4" "D,2" "A,4" "I,2" "A,2" "G,2" "A,2" "G,2" "I,2" "G,2" "G,2" "D,3" "A,4" "A,4" "C,4" "I,2" "B,4" "A,4" "I,2"	"B,4" "H,3" "I,3"	"B,4" "A,4" "I,2"
2	"I,2","B,1"	4	"B,2" "" "" "" "G,2" "B,2" "G,2" "H,3" "G,2" "I,2" "F,3" "C,4" "A,4" "G,2" "C,2" "I,2" "A,4" "I,2" "F,3" "A,2" "" "" "" "" "C,4" "A,4" "C,4" ""	"A,4" "G,2" "C,2" "I,2"	"A,4" "G,2" "C,2" "I,2"

No	Input Pukulan	Jumlah Next Pukulan	TampHasil	Prediksi	Hasil Aktual Video
			"A,4" "C,4" "I,2" "E,3"		
3	"G,2","E,2","C,2", "G,2","D,2", "A,4","G,2","I,2", E,3"	9	Tidak terdefinisi kan	Tidak terdefinisi kan	"A,4" "I,2" "D,3" "A,2" "G,2" "C,2" "B,4" "I,2" "I,2"
4	"G,2","A,1"	3	"G,1" "C,1" "I,2" "H,1" "H,1" "B,1" "I,1" "" "" "A,1" "G,1" "I,1" "C,4" "H,1" "G,1" "E,1" "D,1" "F,1" "C,1" "G,1" "I,1" "C,1" "G,2" "E,1" "F,1" "A,1" "" "B,1" "E,1" "E,2" "H,2" "H,3" ""	"C,4" "H,1" "G,1"	"C,4" "I,1" "A,1"
5	"I,2","F,1","B,4", A,4","I,2"	5	Tidak terdefinisi kan	Tidak terdefinisi kan	"F,3","B,4","E,2","B,1","D,2"
6	"D,2","E,2","E,2"	3	"D,3" "G,1" "B,2"	"D,3" "G,1" "B,2"	"D,2","G,2","A,2"
7	"I,2","E,3","F,2", D,2","F,2", "I,2","D,3","E,2", C,4"	9	Tidak terdefinisi kan	Tidak terdefinisi kan	"I,2","B,1","A,4","C,4","I,2","E,3", "A,4","C,4","A,4"
8	"I,2","G,2","E,2", D,2","G,2"	5	Tidak terdefinisi kan	Tidak terdefinisi kan	"D,1","B,4","I,2","A,2","C,4"
9	"B,2","I,2","D,3", A,4","G,2", "C,2","B,4"		Tidak terdefinisi kan	Tidak terdefinisi kan	"I,2","F,3","C,4","F,2","G,2", "D,2","B,4"

No	Input Pukulan	Jumlah Next Pukulan	TampHasil	Prediksi	Hasil Aktual Video
10	"E,2","A,1","G,2"	5	"E,1" "E,2" "E,1" "B,2" "G,1"	"E,1" "E,2" "E,1" "B,2" "G,1"	"I,2" "E,1" "A,4" "G,2" "A,1"
11	"E,2","I,2","D,3"	3	"D,4" "F,2" "A,1"	"D,4" "F,2" "A,1"	"B,4","F,2","F,1"
12	"I,2","I,2","D,3","A,4","C,4"	5	Tidak terdefiniskan	Tidak terdefiniskan	"I,2","B,1","A,4","I,2","F,3"
13	"I,2","A,1","I,2","A,1","A,2","C,4","A,4"	7	Tidak terdefiniskan	Tidak terdefiniskan	"I,2","F,3","C,4","G,2","I,2","G,2","I,2"
14	"I,2","F,2","A,1","G,2","C,1","A,4","I,2"	7	Tidak terdefiniskan	Tidak terdefiniskan	"F,3","I,2","G,2","F,3","D,2","A,4","I,2"
15	"I,2","H,2","H,3","E,2","D,2","E,2","C,4"	7	Tidak terdefiniskan	Tidak terdefiniskan	"I,2","F,3","C,4","I,2","A,2","G,2","I,2","G,2","C,4"
16	"B,4","A,4","C,4"	3	"A,4" "I,2" "A,1" "A,4" "" "" "I,2" "I,2" "E,2"	"A,4" "I,2" "A,1"	"A,4" "I,2" "A,1"
17	"B,4","B,4","A,4"	3	"G,2" "D,2" "E,2" "G,2" "D,2" "I,2" "" "" "" "I,2" "D,3" "A,4"	"G,2" "D,2" "E,2"	"G,2" "D,2" "E,2"
18	TIMES	3	"D,1","B,4","C,4"	"D,1","B,4","C,4"	"D,1","B,4","C,4"
19	"C,4","A,4","I,2"	3	"F,3" "C,4" "G,2" "G,2" "F,3" "" "A,1" "C,4" "D,2" "H,2" "I,2" "C,1" "D,3" "A,4" "I,2" "F,1" "A,4" "I,2"	"F,3" "C,4" "G,2"	"H,2" "C,4" "G,2"

No	Input Pukulan	Jumlah Next Pukulan	TampHasil	Prediksi	Hasil Aktual Video
			"F,2" "I,2" "E,2" "F,3" "A,1" "I,2" "D,3" "F,2" "C,4" "E,3" "C,4" "G,2"		
20	"F,2","G,2","D,3"	3	"B,4" "C,4" "I,2"	"B,4" "C,4" "I,2"	"B,4" "C,4" "I,2"
21	"B,4","B,4","B,4"	3	"B,4" "A,4" "G,2" "H,2" "" "" "G,2" "A,1" "C,4"	"G,2" "A,1" "C,4"	"G,2" "A,1" "C,4"
22	"B,4","A,4","F,2"	3	"F,1" "B,4" "B,4"	"F,1" "B,4" "B,4"	"F,1" "B,4" "B,4"
23	"B,4","B,4","B,4", "G,2","A,1"	4	"C,4" "I,2" "I,2" "F,1"	"C,4" "I,2" "I,2" "F,1"	"C,4" "I,2" "I,2" "F,1"
24	"F,3","C,4","I,2", A,2","G,2"	4	Tidak terdefiniskan	Tidak terdefiniskan	"I,2" "G,2" "C,4" "A,4"
25	"G,2","D,2","F,2", "G,2","D,3"	4	Tidak terdefiniskan	Tidak terdefiniskan	"B,4" "C,4" "I,2" "F,3"
26	"B,4","B,4","B,4", "G,2","A,1"	4	Tidak terdefiniskan	Tidak terdefiniskan	"C,4" "I,2" "I,2" "F,1"
27	"B,4","C,4","A,4", "C,4","G,2"	4	Tidak terdefiniskan	Tidak terdefiniskan	"D,2" "B,4" "I,2" "F,3"
28	"A,4","G,2","D,2", "F,1","D,2"	4	Tidak terdefiniskan	Tidak terdefiniskan	"I,2" "F,3" "E,2" "E,2"
29	"I,2","G,2","I,3", B,4","A,4"	4	Tidak terdefiniskan	Tidak terdefiniskan	"I,2" "F,2" "F,1" "B,2"
30	I,2","F,3","C,4","I,2", "A,2", "G,2","I,2"	7	Tidak terdefiniskan	Tidak terdefiniskan	"G,2" "C,4" "A,4" "I,2" "D,3" "A,4" "I,2"
31	"A,4","I,2","D,3", A,2","G,2", "C,2","B,4"	7	Tidak terdefiniskan	Tidak terdefiniskan	"I,2" "I,2" "A,4" "C,4" "I,2" "H,2" "G,2"

No	Input Pukulan	Jumlah Next Pukulan	TampHasil	Prediksi	Hasil Aktual Video
32	"B,4","D,2","E,2", "C,4","E,2", "E,2","A,4"	7	Tidak terdefinisi kan	Tidak terdefinisi kan	"C,4" "A,4" "I,2" "F,2" "I,2" "E,2" "B,4"
33	"B,4","A,4","G,2", "I,2","D,3", "A,2","I,2"	7	Tidak terdefinisi kan	Tidak terdefinisi kan	"E,3" "C,4" "B,2" "I,2" "D,3" "A,4" "G,2"
34	"D,2","E,2","D,2", "E,2","I,2", "F,3","B,4"	7	Tidak terdefinisi kan	Tidak terdefinisi kan	"G,2" "D,2" "B,4" "A,4" "C,4" "I,2" "I,2"
35	"A,2","I,2","A,1", D,2","B,4", "G,2","D,3"	7	Tidak terdefinisi kan	Tidak terdefinisi kan	"A,4" "C,4" "I,2" "E,3" "A,4" "I,2" "H,2"
36	"C,4","I,2","A,1", I,2","F,2", "C,4","A,4"	7	Tidak terdefinisi kan	Tidak terdefinisi kan	"G,2" "D,2" "B,4" "A,4" "C,4" "I,2" "I,2"
37	"B,4","I,2","F,3", E,2","B,4", "I,2","F,2"	4	"B,4" "B,4" "G,2" "I,2"	"B,4" "B,4" "G,2" "I,2"	"B,4" "B,4" "G,2" "I,2"
38	"B,4","I,2","F,3", C,4","B,4", "B,4","H,3"	4	Tidak terdefinisi kan	Tidak terdefinisi kan	"I,1","A,4","H,2","D,3"
39	"I,2","F,3","A,2", I,2","A,2", "I,2","F,2"	4	"I,2" "G,2" "I,2" "G,2"	"I,2" "G,2" "I,2" "G,2"	"I,2" "G,2" "I,2" "G,2"
40	"D,2","E,2","C,4", "E,2","E,2", "A,4","C,4"	4	"A,4" "I,2" "F,2" "I,2"	"A,4" "I,2" "F,2" "I,2"	"A,4" "I,2" "F,2" "I,2"
41	"B,4","A,4","C,4", "I,2","I,2", "E,2","F,2"	4	"D,2" "E,2" "E,2" "C,4"	"D,2" "E,2" "E,2" "C,4"	"D,2" "E,2" "E,2" "C,4"
42	"I,2","I,2","G,2","I,2", "F,3", "C,4","A,4"	4	"I,2" "F,3" "A,1" "I,2"	"I,2" "F,3" "A,1" "I,2"	"I,2" "F,3" "A,1" "I,2"
43	"I,2","F,3","A,2", I,2","A,2", "I,2","F,2"	4	"I,2" "G,2" "I,2" "G,2"	"I,2" "G,2" "I,2" "G,2"	"I,2" "G,2" "I,2" "G,2"
44	"I,2","A,1","I,2", F,2","C,4", "A,4","G,2"	4	"D,2" "B,4" "A,4" "C,4"	"D,2" "B,4" "A,4" "C,4"	"D,2" "B,4" "A,4" "C,4"
45	"B,4","G,2","A,1", "C,4","I,2", "I,2","F,1"	4	"C,4" "B,4" "A,4" "I,2"	"C,4" "B,4" "A,4" "I,2"	"C,4" "B,4" "A,4" "I,2"
46	"C,4","G,2","D,1", "A,4","B,4", "G,2","D,3"	4	"B,4" "I,2" "F,3" "D,2"	"B,4" "I,2" "F,3" "D,2"	"B,4" "I,2" "F,3" "D,2"
47	"I,2","A,2","C,4", I,2","H,2", "F,3","C,4","I,2", F,1"	5	Tidak terdefinisi kan	Tidak terdefinisi kan	"D,2" "A,4" "C,2" "H,2" "F,3"

No	Input Pukulan	Jumlah Next Pukulan	TampHasil	Prediksi	Hasil Aktual Video
48	"B,1","A,4","G,2","C,2","I,2","B,2","B,4","I,2","D,3"	5	Tidak terdefiniskan	Tidak terdefiniskan	"F,2" "C,4" "B,2" "I,2" "G,2"
49	"A,4","C,4","A,4","I,2","A,1","C,4","D,2","I,2","D,3"	5	Tidak terdefiniskan	Tidak terdefiniskan	"A,2" "E,2" "C,4" "F,2" "I,2"
50	"G,2","D,1","B,4","C,4","A,4","C,4","I,2","F,3","C,4"	5	Tidak terdefiniskan	Tidak terdefiniskan	"A,4" "C,4" "I,2" "I,2" "D,3"
51	"E,2","D,2","E,2","C,4","I,2","F,3","C,4","I,2","A,2"	5	Tidak terdefiniskan	Tidak terdefiniskan	"G,2" "I,2" "G,2" "C,4" "A,4"
52	"D,3","A,2","G,2","C,2","B,4","I,2","I,2","A,4","C,4"	5	Tidak terdefiniskan	Tidak terdefiniskan	"I,2" "H,2" "G,2" "D,1" "I,2"
53	"I,2","I,2","A,4","C,4","I,2","H,2","G,2","D,1","I,2"	5	Tidak terdefiniskan	Tidak terdefiniskan	"G,2" "A,1" "I,2" "B,2" "I,2"
54	"F,3","C,4"	4	"I,2" "C,1" "A,4" "I,2" "I,2" "F,1" "D,2" "A,4" "G,2" "I,2" "G,2" "I,2" "A,4" "I,2" "G,2" "F,3" "A,4" "C,4" "I,2" "H,2" "A,4" "C,4" "I,2" "I,2" "I,2" "A,2" "G,2" "I,2" "" "" "" "" "A,4" "A,2" "" "" "G,2" "A,2" "I,2" "G,2" "I,2" "B,1" "" "" "F,2" "G,2"	"I,2" "A,2" "G,2" "I,2"	"I,2" "A,2" "G,2" "I,2"

No	Input Pukulan	Jumlah Next Pukulan	TampHasil	Prediksi	Hasil Aktual Video
			"D,2" "B,4" "H,2" "" "" "" "A,4" "I,2" "F,3" "A,1" "B,4" "B,4" "I,2" "A,1"		
5 5	"B,4","A,4"	4	"I,2" "H,2" "G,2" "I,2" "I,2" "F,1" "B,4" "A,4" "G,2" "D,2" "F,1" "D,2" "C,4" "A,4" "" "" "I,2" "F,2" "F,1" "B,2"	"I,2" "H,2" "G,2" "I,2"	"I,2" "H,2" "G,2" "I,2"
5 6	"A,4","H,2"	4	"D,3" "A,4" "I,2" "H,2" "F,3" "" "" ""	"D,3" "A,4" "I,2" "H,2"	"D,3" "A,4" "I,2" "H,2"
5 7	D,3","E,2"	4	"C,4" "I,2" "B,1" "A,4" "G,1" "" "" ""	"C,4" "I,2" "B,1" "A,4"	"C,4" "I,2" "B,1" "A,4"
5 8	"H,3","I,1"	4	"F,2" "B,4" "C,2" "G,3"	"F,2" "B,4" "C,2" "G,3"	"F,2" "B,4" "C,2" "G,3"
5 9	"B,4","E,2"	4	"I,3" "H,3" "I,3" "I,3" "B,1" "D,2" "A,4" "H,2" "C,2" "G,2" "H,2" "I,2" "B,4" "A,4" "E,2" "F,3"	"D,3" "A,4" "C,4" "I,2"	"D,3" "A,4" "C,4" "I,2"

No	Input Pukulan	Jumlah Next Pukulan	TampHasil	Prediksi	Hasil Aktual Video
			"D,3" "A,4" "C,4" "I,2"		
60	"E,3","C,4"	4	"B,2" "I,2" "D,3" "A,4" "" "" "" "" "G,2" "I,2" "I,2" "F,3"	"G,2" "I,2" "I,2" "F,3"	"G,2" "I,2" "I,2" "F,3"
61	"B,4","I,2","D,3"	4	"F,2" "C,4" "B,2" "I,2" "A,4" "I,2" "E,3" "C,4"	"F,2" "C,4" "B,2" "I,2"	"F,2" "C,4" "B,2" "I,2"
62	"E,2","G,2","C,1"	4	"B,4" "C,4" "I,2" "F,1"	"B,4" "C,4" "I,2" "F,1"	"B,4" "C,4" "I,2" "F,1"
63	"B,4","I,2","B,1"	4	"A,4" "G,2" "C,2" "I,2" "G,2" "I,2" "F,3" "C,4"	"A,4" "G,2" "C,2" "I,2"	"A,4" "G,2" "C,2" "I,2"
64	"G,2","C,2","I,2"	4	"H,1" "B,1" "B,1" "I,1" "B,2" "B,4" "I,2" "D,3"	"B,2" "B,4" "I,2" "D,3"	"B,2" "B,4" "I,2" "D,3"
65	"A,4","C,4","A,4"	4	"I,2" "A,1" "C,4" "D,2" "I,2" "F,2" "I,2" "" "I,2" "E,3" "C,4" "G,2"	"I,2" "A,1" "C,4" "D,2"	"I,2" "A,1" "C,4" "D,2"
66	"D,2","F,2","C,4"	4	"B,4" "I,2" "C,2" "A,4"	"B,4" "I,2" "C,2" "A,4"	"B,4" "I,2" "C,2" "A,4"
67	"D,2","B,2","I,2"	4	"F,1" "B,4" "B,4" "I,2"	"F,1" "B,4" "B,4" "I,2"	"F,1" "B,4" "B,4" "I,2"
68	"G,2","I,2","F,3"	4	"C,4" "I,2" "C,1" "A,4" "B,4" "G,2" "F,3" ""	"C,4" "A,4" "I,2" "F,3"	"C,4" "A,4" "I,2" "F,3"

No	Input Pukulan	Jumlah Next Pukulan	TampHasil	Prediksi	Hasil Aktual Video
			"C,4" "A,4" "I,2" "F,3"		
69	"B,2","I,2","F,1"	4	"B,4" "B,4" "I,2" "G,2"	"B,4" "B,4" "I,2" "G,2"	"B,4" "B,4" "I,2" "G,2"
70	"I,2","F,3","D,2"	4	"G,3" "G,3" "A,2" "A,2" "E,2" "C,4" "G,2" "D,1"	"G,3" "G,3" "A,2" "A,2"	"E,2" "C,4" "G,2" "D,1"
71	"B,4","B,4","B,4", "G,2","A,1"	4	"C,4" "I,2" "I,2" "F,1"	"C,4" "I,2" "I,2" "F,1"	"C,4" "I,2" "I,2" "F,1"
72	"I,2","I,2","F,1","C,4", "B,4"	4	"A,4" "I,2" "H,2" "G,2"	"A,4" "I,2" "H,2" "G,2"	"A,4" "I,2" "H,2" "G,2"
73	"I,2","F,3","D,2", "E,2","C,4"	4	"G,2" "D,1" "A,4" "G,2"	"G,2" "D,1" "A,4" "G,2"	"G,2" "D,1" "A,4" "G,2"
74	"G,2","D,2","F,2", "G,2","D,3"	4	"B,4" "C,4" "I,2" "F,3"	"B,4" "C,4" "I,2" "F,3"	"B,4" "C,4" "I,2" "F,3"
75	"D,2","B,2","I,2", "F,1","B,4"	4	"B,4" "I,2" "G,2" "D,3"	"B,4" "I,2" "G,2" "D,3"	"B,4" "I,2" "G,2" "D,3"
76	"I,2","A,2","G,2", "I,2","G,2"	4	"C,4" "A,4" "I,2" "D,3"	"C,4" "A,4" "I,2" "D,3"	"C,4" "A,4" "I,2" "D,3"
77	"I,2","H,2","G,2", "D,1","I,2"	4	"G,2" "A,1" "I,2" "B,2"	"G,2" "A,1" "I,2" "B,2"	"G,2" "A,1" "I,2" "B,2"
78	"D,2","B,2","I,2", "F,1","B,4"	4	"B,4" "I,2" "G,2" "D,3"	"B,4" "I,2" "G,2" "D,3"	"B,4" "I,2" "G,2" "D,3"
79	"F,1","C,4","B,4", "A,4","I,2"	4	"H,2" "G,2" "I,2" "G,2"	"H,2" "G,2" "I,2" "G,2"	"H,2" "G,2" "I,2" "G,2"
80	"I,2","D,3","A,2", "G,2","C,2"	4	"B,4" "I,2" "I,2" "A,4"	"B,4" "I,2" "I,2" "A,4"	"B,4" "I,2" "I,2" "A,4"
81	"B,4","B,4","B,4", "G,2","A,1", "C,4","I,2","I,2", "F,1"	5	Tidak terdefiniskan	Tidak terdefiniskan	"C,4" "B,4" "A,4" "I,2" "H,2"
82	"I,2","E,3","A,4", "I,2","D,3", "A,2","G,2","C,2", "B,4"	5	Tidak terdefiniskan	Tidak terdefiniskan	"I,2" "I,2" "A,4" "C,4" "I,2"

No	Input Pukulan	Jumlah Next Pukulan	Tamp Hasil	Prediksi	Hasil Aktual Video
83	"C,4","I,2","A,2","G,2","I,2","G,2","C,4","A,4","I,2"	5	Tidak terdefiniskan	Tidak terdefiniskan	"D,3" "A,4" "I,2" "D,3" "A,4"
84	"C,4","I,2","F,3","C,4","A,4","C,4","I,2","I,2","D,3"	5	Tidak terdefiniskan	Tidak terdefiniskan	"A,4" "C,4" "I,2" "B,1" "A,4"
85	"I,2","B,2","B,4","I,2","D,3","F,2","C,4","B,2","I,2"	5	Tidak terdefiniskan	Tidak terdefiniskan	"G,2" "E,3" "C,2" "I,2" "C,2"
86	"D,3","F,2","C,4","B,2","I,2","G,2","E,3","C,2","I,2"	5	Tidak terdefiniskan	Tidak terdefiniskan	"C,2" "G,2" "C,2" "A,4" "I,2"
87	"B,4","B,4","B,4","G,2","A,1","C,4","I,2","I,2","F,1"	5	Tidak terdefiniskan	Tidak terdefiniskan	"C,4" "B,4" "A,4" "I,2" "H,2"
88	"I,2","G,2","C,1","A,4","I,2","G,2","F,3","C,4","I,2"	5	Tidak terdefiniskan	Tidak terdefiniskan	"F,1" "I,2" "C,4" "I,2" "A,1"
89	"C,4","B,2","I,2","G,2","E,3","C,2","I,2","C,2","G,2"	5	Tidak terdefiniskan	Tidak terdefiniskan	"C,2" "A,4" "I,2" "G,2" "A,2"
90	"G,2","E,3","C,2","I,2","C,2","G,2","C,2","A,4","I,2"	5	Tidak terdefiniskan	Tidak terdefiniskan	"G,2" "A,2" "C,4" "H,2" "F,3"
91	"B,2","I,2"	3	"G,1" "I,1" "G,1" "G,2" "A,1" "A,1" "D,2" "H,1" "F,1" "" "" "" "A,1" "E,1" "H,1" "B,2" "C,2" "I,2" "" "" "" "C,2" "G,2" "E,1" "G,3" "" ""	"G,2" "C,1" "B,4"	"G,2" "C,1" "B,4"

No	Input Pukulan	Jumlah Next Pukulan	TampHasil	Prediksi	Hasil Aktual Video
			"G,2" "C,1" "B,4" "G,2" "E,3" "C,2" "F,1" "B,4" "B,4" "G,2" "C,2" "H,2" "G,2" "F,3" "C,4" "F,2" "C,4" "F,2" "D,3" "A,4" "G,2"		
9 2	"G,2","E,3"	3	"C,2" "I,2" "C,2" "H,2" "D,3" "I,2" "" "" "" "" "" ""	"C,2" "I,2" "C,2"	"C,2" "I,2" "C,2"
9 3	"F,3","C,4"	3	"I,2" "C,1" "A,4" "I,2" "F,1" "D,2" "G,2" "I,2" "G,2" "A,4" "I,2" "G,2" "A,4" "C,4" "I,2" "A,4" "C,4" "I,2" "I,2" "A,2" "G,2" "" "" "" "A,4" "A,2" "" "G,2" "A,2" "I,2"	"A,4" "C,4" "I,2"	"G,2" "I,2" "G,2"
9 4	"D,2","A,4"	3	"C,2" "H,2" "F,3" "H,2" "F,3" "" "" "" ""	"C,2" "H,2" "F,3"	"C,2" "H,2" "F,3"

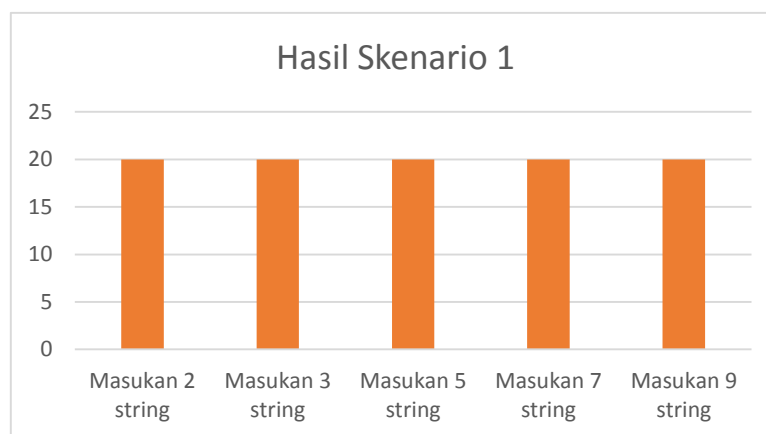
No	Input Pukulan	Jumlah Next Pukulan	TampHasil	Prediksi	Hasil Aktual Video
			"" "" "" "I,2" "2,I" "E,2"		
95	"D,2","B,4"	3	"B,4" "H,3" "I,3" "F,3" "D,3" "F,2" "B,2" "H,3" "F,3" "C,2" "A,4" "C,4" "I,2" "F,3" "A,4" "D,2" "A,4" "I,2" "A,2" "G,2" "A,2"	"B,4" "H,3" "I,3"	"C,2" "A,4" "C,4"
96	"B,4","C,4"	3	"" "" "" "A,2" "H,3" "F,2" "I,2" "F,1" "F,2" "" "" "" "F,2" "E,3" ""	"I,2" "F,1" "F,2"	"I,2" "F,1" "F,2"
97	"D,3","B,4"	3	"B,2" "E,1" "" "I,2" "" "" "C,4" "I,2" "F,3" "I,2" "F,3" "D,2"	"I,2" "F,3" "D,2"	"I,2" "F,3" "D,2"
98	"B,3","B,4"	3	"C,2" "I,2" "F,3" "C,1" "I,2" "" ""	"C,2" "I,2" "F,3"	"C,2" "I,2" "F,3"
99	"H,3","G,2"	3	"" "" "" "" "" "" "" "" "" "B,4""C,3" "E,3"	"B,4""C,3" "E,3"	"B,4""C,3""E,3"
100	"D,1","H,4"	3	"B,3""C,3" "E,3" "B,1""C,3" "E,2"	"B,3""C,3" "E,3"	"B,3""C,3""E,3"

4.6 Pembahasan

Dari hasil eksperimen yang didapatkan, penulis dapat melakukan beberapa pembahasan yang akan dipaparkan pada subsubbab berikut.

4.6.1 Perbandingan Skenario Pertama

Pada eksperimen pertama dilakukan sebanyak lima belas pencarian pattern atau string. Hasil dari setiap pencarian dapat dilihat perbandingan dari jumlah masukan setiap pencariannya. Jumlah masukan string yang dipakai dalam eksperimen ini yaitu sebanyak 2, 3, 5, 7 dan 9 string yang terlihat pada Gambar 4.8

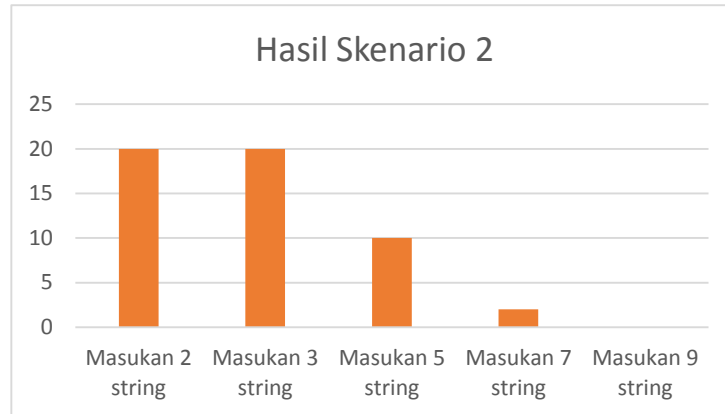


Gambar 4.7 Grafik Skenario pertama

Gambar 4.7 memperlihatkan grafik dari hasil skenario pertama. Pada skenario pertama dari setiap jumlah masukan string semuanya memiliki akurasi 100%. Kesimpulan untuk pencarian string atau pattern pada skenario pertama semuanya ditemukan. Hal ini membuktikan bahwa masukan-masukan pattern atau string pada skenario pertama ada dalam data yang digunakan pada program yang dijalankan.

4.6.2 Perbandingan Skenario Kedua

Pada eksperimen kedua dilakukan sebanyak lima belas pencarian pattern atau string. Hasil dari setiap pencarian dapat dilihat perbandingan dari jumlah masukan setiap pencariannya. Jumlah masukan string yang dipakai dalam eksperimen kedua ini yaitu sebanyak 2, 3, 5, 7 dan 9 string. Dari kelima jumlah masukan string setiap masukan mempunyai dua kemungkinan ditemukan atau tidak ditemukan, hal ini ketika ditemukan hasil akan disimbolkan dengan angka 2 dan ketika tidak ditemukan hasil akan disimbolkan dengan angka 1.



Gambar 4.8 Grafik Skenario Kedua

Gambar 4.8 memperlihatkan grafik dari hasil skenario kedua. Pada skenario kedua dari masukan string dengan Panjang dua karakter memiliki nilai 20% dari 20 percobaan, dari masukan string dengan Panjang tiga karakter memiliki nilai 20% dari 20 percobaan, dari masukan string dengan Panjang lima karakter memiliki nilai 10% dari 20 percobaan, dari masukan string dengan Panjang tujuh karakter memiliki nilai 3% dari 20 percobaan dan dari masukan string dengan Panjang sembilan karakter memiliki nilai 0% dari 20 percobaan. Hal ini membuktikan bahwa semakin Panjang string yang dicari maka semakin sedikit kemungkinan ditemukan. Akurasi dari scenario kedua yaitu 53%.