EXPERIMENT - 9

Operating Systems Lab

AIM

Write a program to perform priority scheduling.

Syeda Reeha Quasar
14114802719
6C7

EXPERIMENT – 9

Aim:

Write a program to perform priority scheduling.

Source Code:

```
#! /bin/bash

> input.txt

function priorityScheduling {
   awt=0
   totalwt=0
   totaltat=0
   atat=0
   declare -a  wt
   declare -a  tat

   sh sortfile.sh
   IFS=$'\n'
   i=1
   for line in $(cat ./output.txt)
   do
      IFS=" "
      var=($line)
      priority[i]=${var[0]}
      Btime[i]=${var[1]}
      p[i]=${var[2]}
      i=$((i+1))
   done

   echo -e "Process\t    Burst Time    \tWaiting Time\tTurnaround Time \t Priority"
   for ((i=1;i<=number;i++))
   do
      wt[i]=0;
      tat[i]=0;
      for ((j=0;j<i;j++))
      do
         wt[i]="$((wt[i]+Btime[j]))"     #calculate waiting time
      done
      totalwt="$((totalwt+wt[i]))"     #calculate total waiting time
      tat[i]="$((Btime[i]+wt[i]))"     #calculate turnaround time
      totaltat="$((totaltat+tat[i]))"     #calculate total turnaround time
      echo -e "${p[i]}\t\t  ${Btime[i]}\t\t    ${wt[i]}\t\t\t${tat[i]} \t\t ${priority[i]}"
   done

   awt=$(echo 'scale=2;' "$totalwt" / "$number" | bc -l)     #calculate average waiting time
   atat=$(echo 'scale=2;' "$totaltat" / "$number" | bc -l)   #calculate average turnaround time
   echo -e "\n"
   echo "Total waiting time =" "$totalwt"
   echo "Average waiting time =" "$awt"
   echo "Total Turnaround Time =" "$totaltat"
```

```
   echo "Average Turnaround Time =" "$atat"
}

#Accepts user input for Number of Processes and Input Validation
echo "Enter the number of processes -- "
read -r number

while [[ "$number" -le 1 ]] || [[ -z "$number" ]]
do
   echo "Error: No. of process cannot be blank or less than 2"
   echo "Please try again."
   echo "Enter the number of processes -- "
   read -r number
done

declare -a Btime
declare -a  p
declare -a priority
declare -a data

#Accepts user input for Burst Time and Input Validation
for (( i=1; i<=number; i++ ))
do
   echo "For process ------- $((i))"
   echo "Enter Priority of the process:"
   read -r "priority[i]"
   echo "Enter Burst Time of the process:"
   read -r "Btime[i]"

   while [[ "${Btime[i]}" -lt 1 ]] || [[ -z "${Btime[i]}" ]]
   do
      echo "Error: Input valid priority or burst time for the process or Inputs cannot be blank"
      echo "Please try again."
      echo "Enter Priority of the process:"
      read -r "priority[i]"
      echo "Enter Burst Time of the process:"
      read -r "Btime[i]"
   done
   p[i]=$((i))
   echo $(echo ${priority[i]} ${Btime[i]} ${p[i]}) >> input.txt
done

echo -e "CPU burst Time for processes in nano second --" "${Btime[@]}"
echo -e "Process Number for CPU burst time          --" "${p[@]}"
echo ""
echo "Calculation for Priority Scheduling for processes entered are as follows: "
priorityScheduling
```

Output:

```
reeha@Reeha:/mnt/e/sem 6/Operating Systems$ ./priority.sh
Enter the number of processes --
3
For process ------- 1
Enter Priority of the process:
1
Enter Burst Time of the process:
1
For process ------- 2
Enter Priority of the process:
23
Enter Burst Time of the process:
2
For process ------- 3
Enter Priority of the process:
3
Enter Burst Time of the process:
3
CPU burst Time for processes in nano second -- 1 2 3
Process Number for CPU burst time           -- 1 2 3

Calculation for Priority Scheduling for processes entered are as follows:
Process     Burst Time          Waiting Time    Turnaround Time          Priority
2                2                  0                  2                23
3                3                  2                  5                3
1                1                  5                  6                1


Total waiting time = 7
Average waiting time = 2.33
Total Turnaround Time = 13
Average Turnaround Time = 4.33
```

```
reeha@Reeha:/mnt/e/sem 6/Operating Systems$ ./priority.sh
Enter the number of processes --
5
For process ------- 1
Enter Priority of the process:
23
Enter Burst Time of the process:
43
For process ------- 2
Enter Priority of the process:
12
Enter Burst Time of the process:
34
For process ------- 3
Enter Priority of the process:
54
Enter Burst Time of the process:
23
For process ------- 4
Enter Priority of the process:
12
Enter Burst Time of the process:
53
For process ------- 5
Enter Priority of the process:
65
Enter Burst Time of the process:
77
CPU burst Time for processes in nano second -- 43 34 23 53 77
Process Number for CPU burst time           -- 1 2 3 4 5

Calculation for Priority Scheduling for processes entered are as follows:
Process     Burst Time          Waiting Time    Turnaround Time          Priority
5                77                 0                  77               65
3                23                 77                 100              54
1                43                 100                143              23
4                53                 143                196              12
2                34                 196                230              12


Total waiting time = 516
Average waiting time = 103.20
Total Turnaround Time = 746
Average Turnaround Time = 149.20
```