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**Aim -**  Implementation of Priority Based scheduling Algorithm.

**Program :-**

import java.util.Scanner;

public class PriorityBased {

int burstTime[];

int priority[];

int arrivalTime[];

String[] processId;

int numberOfProcess;

void getProcessData(Scanner input)

{

System.out.print("Enter the number of Process for Scheduling : ");

int inputNumberOfProcess = input.nextInt();

numberOfProcess = inputNumberOfProcess;

burstTime = new int[numberOfProcess];

priority = new int[numberOfProcess];

arrivalTime = new int[numberOfProcess];

processId = new String[numberOfProcess];

String st = "P";

for (int i = 0; i < numberOfProcess; i++)

{

processId[i] = st.concat(Integer.toString(i));

System.out.print("Enter the burst time for Process - " + (i) + " : ");

burstTime[i] = input.nextInt();

System.out.print("Enter the arrival time for Process - " + (i) + " : ");

arrivalTime[i] = input.nextInt();

System.out.print("Enter the priority for Process - " + (i) + " : ");

priority[i] = input.nextInt();

}

}

void sortAccordingArrivalTimeAndPriority(int[] at, int[] bt, int[] prt, String[] pid)

{

int temp;

String stemp;

for (int i = 0; i < numberOfProcess; i++)

{

for (int j = 0; j < numberOfProcess - i - 1; j++)

{

if (at[j] > at[j + 1])

{

//swapping arrival time

temp = at[j];

at[j] = at[j + 1];

at[j + 1] = temp;

//swapping burst time

temp = bt[j];

bt[j] = bt[j + 1];

bt[j + 1] = temp;

//swapping priority

temp = prt[j];

prt[j] = prt[j + 1];

prt[j + 1] = temp;

//swapping process identity

stemp = pid[j];

pid[j] = pid[j + 1];

pid[j + 1] = stemp;

}

//sorting according to priority when arrival timings are same

if (at[j] == at[j + 1])

{

if (prt[j] > prt[j + 1])

{

//swapping arrival time

temp = at[j];

at[j] = at[j + 1];

at[j + 1] = temp;

//swapping burst time

temp = bt[j];

bt[j] = bt[j + 1];

bt[j + 1] = temp;

//swapping priority

temp = prt[j];

prt[j] = prt[j + 1];

prt[j + 1] = temp;

//swapping process identity

stemp = pid[j];

pid[j] = pid[j + 1];

pid[j + 1] = stemp;

}

}

}

}

}

void priorityNonPreemptiveAlgorithm()

{

int finishTime[] = new int[numberOfProcess];

int bt[] = burstTime.clone();

int at[] = arrivalTime.clone();

int prt[] = priority.clone();

String pid[] = processId.clone();

int waitingTime[] = new int[numberOfProcess];

int turnAroundTime[] = new int[numberOfProcess];

sortAccordingArrivalTimeAndPriority(at, bt, prt, pid);

//calculating waiting & turn-around time for each process

finishTime[0] = at[0] + bt[0];

turnAroundTime[0] = finishTime[0] - at[0];

waitingTime[0] = turnAroundTime[0] - bt[0];

for (int i = 1; i < numberOfProcess; i++)

{

finishTime[i] = bt[i] + finishTime[i - 1];

turnAroundTime[i] = finishTime[i] - at[i];

waitingTime[i] = turnAroundTime[i] - bt[i];

}

float sum = 0;

for (int n : waitingTime)

{

sum += n;

}

float averageWaitingTime = sum / numberOfProcess;

sum = 0;

for (int n : turnAroundTime)

{

sum += n;

}

float averageTurnAroundTime = sum / numberOfProcess;

//print on console the order of processes along with their finish time & turn around time

System.out.println("Priority Scheduling Algorithm : ");

System.out.format("%20s%20s%20s%20s%20s%20s%20s\n", "ProcessId", "BurstTime", "ArrivalTime", "Priority", "FinishTime", "WaitingTime", "TurnAroundTime");

for (int i = 0; i < numberOfProcess; i++) {

System.out.format("%20s%20d%20d%20d%20d%20d%20d\n", pid[i], bt[i], at[i], prt[i], finishTime[i], waitingTime[i], turnAroundTime[i]);

}

System.out.format("%100s%20f%20f\n", "Average", averageWaitingTime, averageTurnAroundTime);

}

public static void main(String[] args)

{

Scanner input = new Scanner(System.in);

PriorityBased obj = new PriorityBased();

obj.getProcessData(input);

obj.priorityNonPreemptiveAlgorithm();

}

}

**Output:-**

Enter the number of Process for Scheduling : 4

Enter the burst time for Process - 0 : 5

Enter the arrival time for Process - 0 : 0

Enter the priority for Process - 0 : 3

Enter the burst time for Process - 1 : 3

Enter the arrival time for Process - 1 : 3

Enter the priority for Process - 1 : 2

Enter the burst time for Process - 2 : 2

Enter the arrival time for Process - 2 : 1

Enter the priority for Process - 2 : 1

Enter the burst time for Process - 3 : 8

Enter the arrival time for Process - 3 : 5

Enter the priority for Process - 3 : 4

Priority Scheduling Algorithm :

ProcessId BurstTime ArrivalTime Priority FinishTime WaitingTime TurnAroundTime

P0 5 0 3 5 0 5

P2 2 1 1 7 4 6

P1 3 3 2 10 4 7

P3 8 5 4 18 5 13

Average 3.250000 7.750000