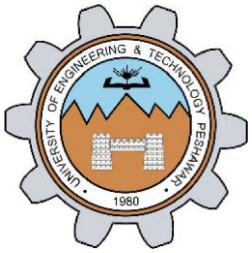
# LAB #11

# Simulation of Preemptive Process Scheduling Algorithms

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**CSE-204L Operating Systems Lab**

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Section: C

"On my honor, as a student of the University of Engineering and Technology, I have neither given nor received unauthorized assistance on this academic work"

Submitted to:

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(26 May 2023)

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# TASK 1

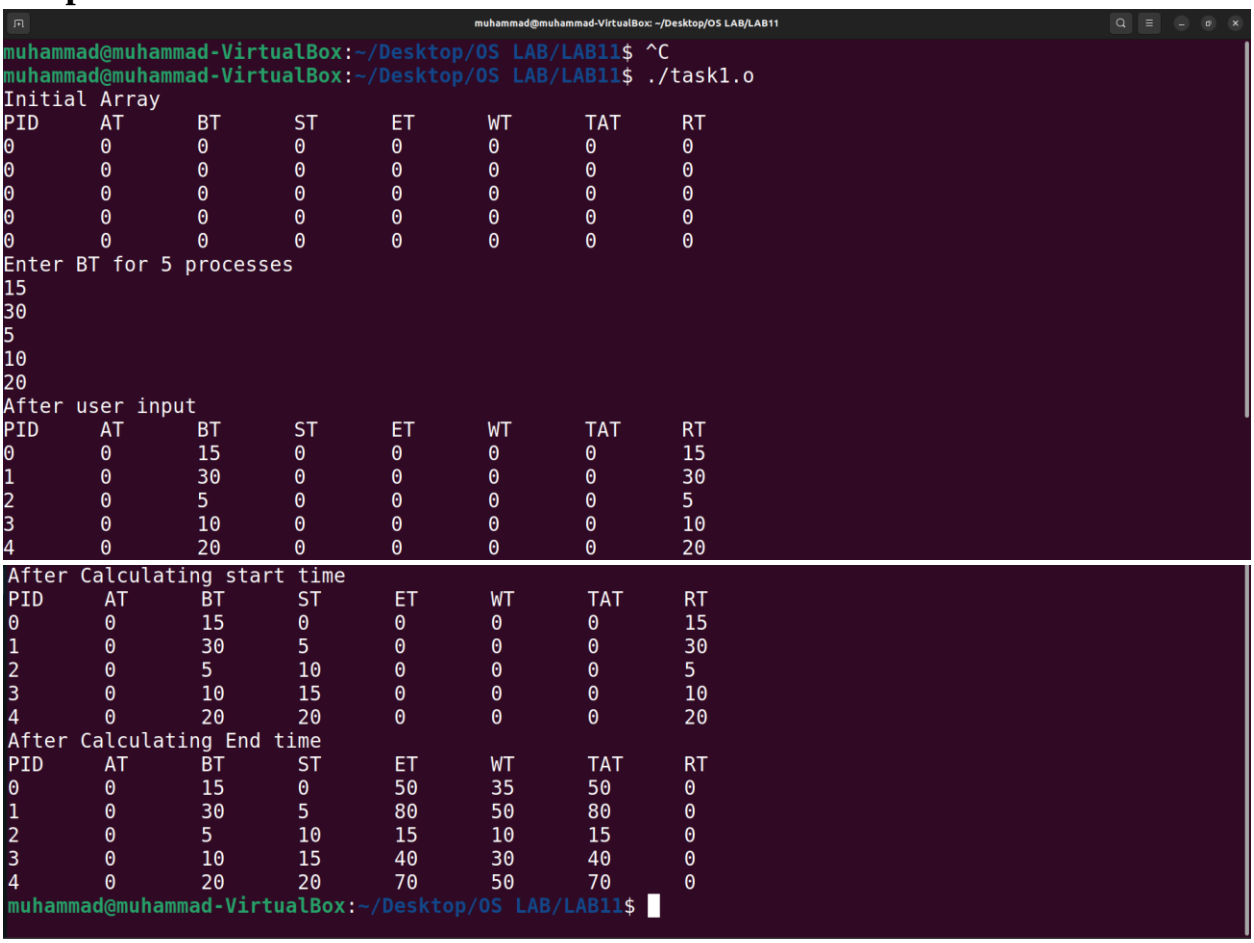
## CODE:

task1.c
~/Desktop/OS LAB/LAB11

```c
#include<stdio.h>
#include<unistd.h>

#define NUM 5
#define INFO 8
#define PID 0
#define AT 1
#define BT 2
#define ST 3
#define ET 4
#define WT 5
#define TAT 6
#define RT 7
#define TQ 5

int findItr(int arr[NUM][INFO]){
 int max = 0;
 for(int i=0;i<NUM;i++){
         if(arr[i][BT]> max){
                 max = arr[i][BT];
         }
 }
 return max/TQ;
}


void display(int arr[NUM][INFO])
{
        printf("PID\tAT\tBT\tST\tET\tWT\tTAT\tRT\n");
        for(int i = 0;i<=4;i++)
        {
        printf("%d\t%d\t%d\t%d\t%d\t%d\t%d\t%d\n", arr[i][PID], arr[i][AT], arr[i][BT], arr[i][ST], arr[i][ET],arr[i][WT],arr[i][TAT],arr[i][RT]);
        }
}

int main(){
  int Processes[NUM][INFO] = {0};

  printf("Initial Array\n");
  display(Processes);

  printf("Enter BT for %d processes\n",NUM);
  for(int i=0;i<NUM;i++){

  scanf("%d",&Processes[i][BT]);

  Processes[i][RT]  = Processes[i][BT];
```

```
48  Processes[i][PID] = i;
49  Processes[i][AT]  = 0;
50  }
51
52  printf("After user input\n");
53  display(Processes);
54
55//Calculation for start time
56  for(int i=0;i<NUM;i++)
57  {
58  Processes[i][ST] = i*5;
59  }
60
61  printf("After Calculating start time\n");
62  display(Processes);
63
64//Calculating end time
65  int current_Time = 0;
66  int ITR  = findItr(Processes);
67  //printf("Total Iterations required are %d\n",ITR);
68
69  for( int j=0 ; j<ITR ; j++ )
70  {
71          for( int i=0 ; i<NUM ; i++ )
72          {
73                if(Processes[i][RT]!=0)
74                {
75                        //CPU allocated
76                        Processes[i][RT] -= TQ;
77                        current_Time     += TQ;
78                        if(Processes[i][RT]==0)
79                                Processes[i][ET] = current_Time;
80                }
81          }
82  } //Calculating end time
83
84//Calculating WT and TAT
85        for( int i=0 ; i<NUM ; i++ )
86        {
87                Processes[i][WT]  = Processes[i][ET]-Processes[i][BT]-Processes[i][AT];
88                Processes[i][TAT] = Processes[i][WT] + Processes[i][BT];
89        }
90
91  printf("After Calculating End time\n");
92  display(Processes);
93
94
95return 0;}
```

## Output:


muhammad@muhammad-VirtualBox: ~/Desktop/OS LAB/LAB11
muhammad@muhammad-VirtualBox:~/Desktop/OS LAB/LAB11$ ^C
muhammad@muhammad-VirtualBox:~/Desktop/OS LAB/LAB11$ ./task1.o
Initial Array
PID AT BT ST ET WT TAT RT
0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0
Enter BT for 5 processes
15
30
5
10
20
After user input
PID AT BT ST ET WT TAT RT
0 0 15 0 0 0 0 15
1 0 30 0 0 0 0 30
2 0 5 0 0 0 0 5
3 0 10 0 0 0 0 10
4 0 20 0 0 0 0 20
After Calculating start time
PID AT BT ST ET WT TAT RT
0 0 15 0 0 0 0 15
1 0 30 5 0 0 0 30
2 0 5 10 0 0 0 5
3 0 10 15 0 0 0 10
4 0 20 20 0 0 0 20
After Calculating End time
PID AT BT ST ET WT TAT RT
0 0 15 0 50 35 50 0
1 0 30 5 80 50 80 0
2 0 5 10 15 10 15 0
3 0 10 15 40 30 40 0
4 0 20 20 70 50 70 0
muhammad@muhammad-VirtualBox:~/Desktop/OS LAB/LAB11$