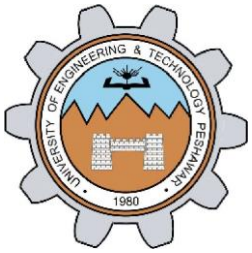
LAB #10

Simulation of Non-preemptive Process Scheduling Algorithms



Spring 2023

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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(27 May 2023)

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TASK 1

CODE:

task1.c
~/Desktop/OS LAB/LAB10

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

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

void display(int arr[NUM][INFO])
{
        printf("PID\tAT\tBT\tST\tET\tWT\tTAT\n");
        for(int i = 0;i<=4;i++)
        {
        printf("%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]);
        }
}

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

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

  printf("Enter AT and BT for %d processes\n",NUM);
  for(int i=0;i<NUM;i++){
  Processes[i][PID] = i;
  scanf("%d",&Processes[i][AT]);
  scanf("%d",&Processes[i][BT]);
  }
  printf("After user input\n");
  display(Processes);



  //Sorting
  printf("After Sorting\n");
  for(int i=0;i<NUM-1;i++){
     for(int j=0;j<NUM-i-1;j++){
             if(Processes[j][AT]>Processes[j+1][AT]){
             int temp[NUM][INFO];

             temp[j][PID] = Processes[j][PID];
```

```
Open   task1.c  ~/Desktop/OS LAB/LAB10   Save
48              temp[j][AT] = Processes[j][AT];
49              temp[j][BT] = Processes[j][BT];
50              temp[j][ST] = Processes[j][ST];
51              temp[j][ET] = Processes[j][ET];
52              temp[j][TAT] = Processes[j][TAT];
53
54              Processes[j][PID] = Processes[j+1][PID];
55              Processes[j][AT] = Processes[j+1][AT];
56              Processes[j][BT] = Processes[j+1][BT];
57              Processes[j][ST] = Processes[j+1][ST];
58              Processes[j][ET] = Processes[j+1][ET];
59              Processes[j][TAT] = Processes[j+1][TAT];
60
61              Processes[j+1][PID] = temp[j][PID];
62              Processes[j+1][AT] = temp[j][AT];
63              Processes[j+1][BT] = temp[j][BT];
64              Processes[j+1][ST] = temp[j][ST];
65              Processes[j+1][ET] = temp[j][ET];
66              Processes[j+1][TAT] = temp[j][TAT];
67              }
68
69      }
70    }
71    //CALCULATION FOR PROCESSES
72    for(int i = 0 ; i < NUM ; i++ ){
73            if(i==0){
74            //Calculation for first Processes
75            Processes[i][ST] = Processes[i][AT];
76            Processes[i][ET] = Processes[i][ST] + Processes[i][BT];
77            Processes[i][WT] = 0 ;
78            Processes[i][TAT] = Processes[i][WT] + Processes[i][BT];
79            }
80            else{
81            //Calculation for the rest of Processes
82            Processes[i][ST] = Processes[i-1][ET];
83            Processes[i][ET] = Processes[i][ST] + Processes[i][BT];
84            Processes[i][WT] = Processes[i][ST] - Processes[i][AT] ;
85            Processes[i][TAT] = Processes[i][WT] + Processes[i][BT];}
86
87    }
88
89   display(Processes);
90
91 return 0;}
```

OUTPUT:

```
muhammad@muhammad-VirtualBox: ~/Desktop/OS LAB/LAB10
muhammad@muhammad-VirtualBox:~/muhammad@muhammuhammad@muhammumumuhammad@muhammad-VirtualBox:~/Desktop/
OS LAB/LAB10$ ^C
muhammad@muhammad-VirtualBox:~/Desktop/OS LAB/LAB10$ ./task1.o
Initial Array
PID     AT      BT      ST      ET      WT      TAT
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 AT and BT for 5 processes
15
5
3
10
1
15
7
5
10
8
```

```
After user input
PID     AT      BT      ST      ET      WT      TAT
0       15      5       0       0       0       0
1       3       10      0       0       0       0
2       1       15      0       0       0       0
3       7       5       0       0       0       0
4       10      8       0       0       0       0
After Sorting
PID     AT      BT      ST      ET      WT      TAT
2       1       15      1       16      0       15
1       3       10      16      26      13      23
3       7       5       26      31      19      24
4       10      8       31      39      21      29
0       15      5       39      44      24      29
muhammad@muhammad-VirtualBox:~/Desktop/OS LAB/LAB10$
```

TASK 2

CODE:

task2.c
~/Desktop/OS LAB/LAB10

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

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

void display(int arr[NUM][INFO]){
        printf("PID\tAT\tBT\tST\tET\tWT\tTAT\n");
        for(int i = 0;i<=4;i++)
        {
        printf("%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]);
        }
        }

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

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

  printf("Enter AT and BT for %d processes\n",NUM);
  for(int i=0;i<NUM;i++){
  Processes[i][PID] = i;
  scanf("%d",&Processes[i][AT]);
  scanf("%d",&Processes[i][BT]);
  }
  printf("After user input\n");
  display(Processes);



  //Sorting
  printf("After Sorting\n");
  for(int i=0;i<NUM-1;i++){
     for(int j=0;j<NUM-i-1;j++){
             if(Processes[j][BT]>Processes[j+1][BT]){
             int temp[NUM][INFO];

             temp[j][PID] = Processes[j][PID];
             temp[j][AT] = Processes[j][AT];
```

```
48              temp[j][BT] = Processes[j][BT];
49              temp[j][ST] = Processes[j][ST];
50              temp[j][ET] = Processes[j][ET];
51              temp[j][TAT] = Processes[j][TAT];
52
53              Processes[j][PID] = Processes[j+1][PID];
54              Processes[j][AT] = Processes[j+1][AT];
55              Processes[j][BT] = Processes[j+1][BT];
56              Processes[j][ST] = Processes[j+1][ST];
57              Processes[j][ET] = Processes[j+1][ET];
58              Processes[j][TAT] = Processes[j+1][TAT];
59
60              Processes[j+1][PID] = temp[j][PID];
61              Processes[j+1][AT] = temp[j][AT];
62              Processes[j+1][BT] = temp[j][BT];
63              Processes[j+1][ST] = temp[j][ST];
64              Processes[j+1][ET] = temp[j][ET];
65              Processes[j+1][TAT] = temp[j][TAT];
66              }
67              }
68              }
69
70    //CALCULATION FOR PROCESSES
71    for(int i = 0 ; i < NUM ; i++ ){
72            if(i==0){
73            //Calculation for first Processes
74            Processes[i][ST] = Processes[i][AT];
75            Processes[i][ET] = Processes[i][ST] + Processes[i][BT];
76            Processes[i][WT] = 0 ;
77            Processes[i][TAT] = Processes[i][WT] + Processes[i][BT];
78            }
79            else{
80            //Calculation for the rest of Processes
81            Processes[i][ST] = Processes[i-1][ET];
82            Processes[i][ET] = Processes[i][ST] + Processes[i][BT];
83            Processes[i][WT] = Processes[i][ST] - Processes[i][AT] ;
84            Processes[i][TAT] = Processes[i][WT] + Processes[i][BT];}
85            }
86
87  display(Processes);
88
89return 0;}
```

OUTPUT:

```
muhammad@muhammad-VirtualBox: ~/Desktop/OS LAB/LAB10
muhammad@muhammad-VirtualBox:~/Desktop/OS LAB/LAB10$ ^C
muhammad@muhammad-VirtualBox:~/Desktop/OS LAB/LAB10$ ./task2.o
Initial Array
PID     AT      BT      ST      ET      WT      TAT
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 AT and BT for 5 processes
15
5
3
10
1
15
7
5
10
8
```

```
After user input
PID     AT      BT      ST      ET      WT      TAT
0       15      5       0       0       0       0
1       3       10      0       0       0       0
2       1       15      0       0       0       0
3       7       5       0       0       0       0
4       10      8       0       0       0       0
After Sorting
PID     AT      BT      ST      ET      WT      TAT
0       15      5       15      20      0       5
3       7       5       20      25      13      18
4       10      8       25      33      15      23
1       3       10      33      43      30      40
2       1       15      43      58      42      57
muhammad@muhammad-VirtualBox:~/Desktop/OS LAB/LAB10$
```