National University of Modern Languages

Lab Report#07

Roll # 2340

Class: BSCS 5B Morning

Subject: Operating System(Lab)

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Implement Round Robin CPU Scheduling Algorithm.

```
// C++ program for implementation of RR scheduling
#include<iostream>
using namespace std;

// Function to find the waiting time for all
// processes
void findWaitingTime(int processes[], int n,
            int bt[], int wt[], int quantum)
{
    // Make a copy of burst times bt[] to store remaining
    // burst times.
    int rem_bt[n];
    for (int i = 0 ; i < n ; i++)
        rem_bt[i] = bt[i];

    int t = 0; // Current time

    // Keep traversing processes in round robin manner
    // until all of them are not done.
    while (1)
    {
        bool done = true;

        // Traverse all processes one by one repeatedly
```

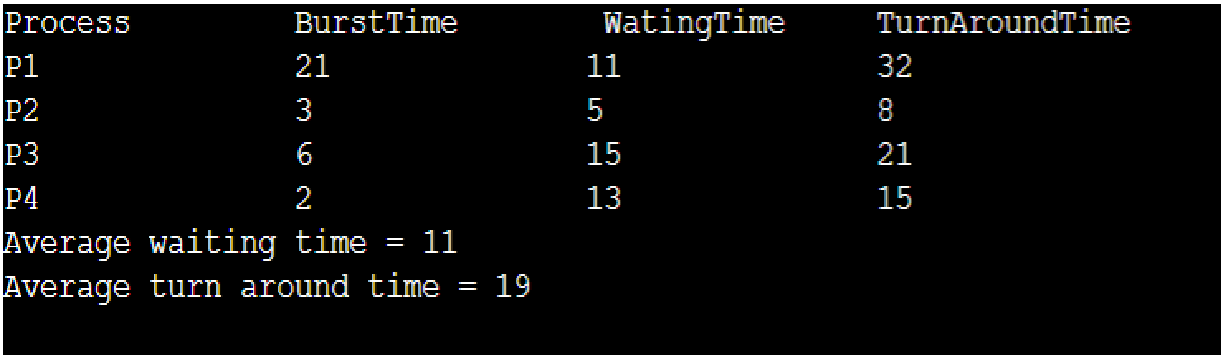
```
for (int i = 0 ; i < n; i++)
{
    // If burst time of a process is greater than 0
    // then only need to process further
    if (rem_bt[i] > 0)
    {
        done = false; // There is a pending process

        if (rem_bt[i] > quantum)
        {
            // Increase the value of t i.e. shows
            // how much time a process has been processed
            t += quantum;

            // Decrease the burst_time of current process
            // by quantum
            rem_bt[i] -= quantum;
        }

        // If burst time is smaller than or equal to
        // quantum. Last cycle for this process
        else
        {
            // Increase the value of t i.e. shows
            // how much time a process has been processed
```

```
                    t = t + rem_bt[i];

                    // Waiting time is current time minus time
                    // used by this process
                    wt[i] = t - bt[i];

                    // As the process gets fully executed
                    // make its remaining burst time = 0
                    rem_bt[i] = 0;
                }
            }
        }

        // If all processes are done
        if (done == true)
        break;
    }
}

// Function to calculate turn around time
void findTurnAroundTime(int processes[], int n,
                        int bt[], int wt[], int tat[])
{
    // calculating turnaround time by adding
    // bt[i] + wt[i]
    for (int i = 0; i < n ; i++)
        tat[i] = bt[i] + wt[i];
}

// Function to calculate average time
void findavgTime(int processes[], int n, int bt[],
                                    int quantum)
{
    int wt[n], tat[n], total_wt = 0, total_tat = 0;

    // Function to find waiting time of all processes
    findWaitingTime(processes, n, bt, wt, quantum);

    // Function to find turn around time for all processes
    findTurnAroundTime(processes, n, bt, wt, tat);

    // Display processes along with all details
    cout << "Process\t "<< " \tBurstTime"
        << "\t WatingTime " << " \tTurnAroundTime\n";

    // Calculate total waiting time and total turn
    // around time
    for (int i=0; i<n; i++)
    {
        total_wt = total_wt + wt[i];
```

```
                total_tat = total_tat + tat[i];
                cout << "P" << i+1 << "\t\t" << bt[i] <<"\t\t"
                        << wt[i] <<"\t\t" << tat[i] <<endl;
        }

        cout << "Average waiting time = "
                << (float)total_wt / (float)n;
        cout << "\nAverage turn around time = "
                << (float)total_tat / (float)n;
}

// Driver code
int main()
{
        // process id's
        int processes[] = { 1, 2, 3,4};
        int n = sizeof processes / sizeof processes[0];

        // Burst time of all processes
        int burst_time[] = {21,3,6,2};

        // Time quantum
        int quantum = 5;
        findavgTime(processes, n, burst_time, quantum);
        return 0;
```

```
}
```

Output:



```
Process         BurstTime        WatingTime     TurnAroundTime
P1              21              11              32
P2              3               5               8
P3              6               15              21
P4              2               13              15
Average waiting time = 11
Average turn around time = 19
```