Mawlana Bhashani Science and Technology University

Lab-Report

Report No: 10

Course code: ICT-3110

Course title: Operating Systems Lab

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Experiment No : 10

Experiment Name : Implementation of Round Robin scheduling algorithm

Theory :

The name of this algorithm comes from the round-robin principle, where each person gets an equal share of something in turns. It is the oldest, simplest scheduling algorithm, which is mostly used for multitasking.

In Round-robin scheduling, each ready task runs turn by turn only in a cyclic queue for a limited time slice. This algorithm also offers starvation free execution of processes.

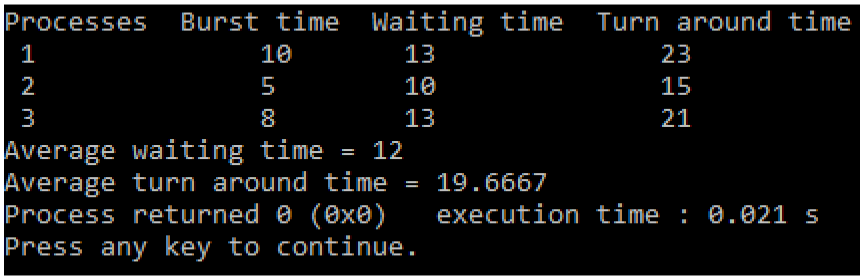
- Round robin is a pre-emptive algorithm
- The CPU is shifted to the next process after fixed interval time, which is called time quantum/time slice.
- The process that is preempted is added to the end of the queue.
- Round robin is a hybrid model which is clock-driven
- Time slice should be minimum, which is assigned for a specific task that needs to be processed. However, it may differ OS to OS.
- It is a real time algorithm which responds to the event within a specific time limit.
- Round robin is one of the oldest, fairest, and easiest algorithm.
- Widely used scheduling method in traditional OS.

Working Process :

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

void findWaitingTime(int processes[], int n,
                        int bt[], int wt[], int quantum)
{
        int rem_bt[n];
        for (int i = 0 ; i < n ; i++)
                rem_bt[i] = bt[i];

        int t = 0;

        while (1)
        {
                bool done = true;
        for (int i = 0 ; i < n; i++)
        {
            if (rem_bt[i] > 0)
            {
                done = false;

                if (rem_bt[i] > quantum)
                {
                    t += quantum;
                    rem_bt[i] -= quantum;
                }
                else
                {
                    t = t + rem_bt[i];
                    wt[i] = t - bt[i];
                    rem_bt[i] = 0;
                }
            }
        }
        if (done == true)
        break;
    }
}
void findTurnAroundTime(int processes[], int n,int bt[], int wt[], int tat[])
{
    for (int i = 0; i < n ; i++)
        tat[i] = bt[i] + wt[i];
}
void findavgTime(int processes[], int n, int bt[],int quantum)
{
    int wt[n], tat[n], total_wt = 0, total_tat = 0;
    findWaitingTime(processes, n, bt, wt, quantum);
    findTurnAroundTime(processes, n, bt, wt, tat);
    cout << "Processes "<< " Burst time "
        << " Waiting time " << " Turn around time\n";
    for (int i=0; i<n; i++)
    {
        total_wt = total_wt + wt[i];
        total_tat = total_tat + tat[i];
        cout << " " << i+1 << "\t\t" << bt[i] <<"\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;
}
int main()
{
          // process id's
          int processes[] = { 1, 2, 3};
          int n = sizeof processes / sizeof processes[0];

          // Burst time of all processes
          int burst_time[] = {10, 5, 8};

          // Time quantum
          int quantum = 2;
          findavgTime(processes, n, burst_time, quantum);
          return 0;
}
```

Output :



```
Processes  Burst time  Waiting time  Turn around time
 1              10       13               23
 2              5        10               15
 3              8        13               21
Average waiting time = 12
Average turn around time = 19.6667
Process returned 0 (0x0)   execution time : 0.021 s
Press any key to continue.
```

Discussion :

This lab helps to learn Round Robin scheduling algorithm. We have implemented this algorithm using C language. In future we can solve any problem of this algorithm.