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Assignment

Priority Scheduling

```
#include <iostream>
#include <algorithm>
#include <vector>
using namespace std;

class Process
{
public:
    int process_id;
    int burst_time;
    int priority;

    Process(int process_id, int burst_time, int priority)
    {
        this->process_id = process_id;
        this->burst_time = burst_time;
        this->priority = priority;
    }
};

void waitingTime(vector<Process> &process, int waitingtime[])
{
    int n = process.size();
    waitingtime[0] = 0;
    for (int i = 1; i < n; i++)
        waitingtime[i] = process[i - 1].burst_time + waitingtime[i - 1];
}

void turnAroundTime(vector<Process> &process, int waitingtime[], int
tat[])
{
    int n = process.size();
    for (int i = 0; i < n; i++)
        tat[i] = process[i].burst_time + waitingtime[i];
}

void averageTime(vector<Process> &process)
```

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```
{
    int n = process.size();

    int waitingtime[n], tat[n], total_waitingtime = 0, total_tat = 0;

    waitingTime(process, waitingtime);

    turnAroundTime(process, waitingtime, tat);

    cout << "\nProcesses "
         << " Burst time "
         << " Waiting time "
         << " Turn around time\n";

    for (int i = 0; i < n; i++)
    {
        int n = process.size();
        total_waitingtime = total_waitingtime + waitingtime[i];
        total_tat = total_tat + tat[i];
        cout << " " << process[i].process_id << "\t\t" <<
process[i].burst_time << "\t " << waitingtime[i] << "\t\t " << tat[i] <<
endl;
    }

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

void scheduling(vector<Process> &process)
{
    int n = process.size();
    sort(process.begin(), process.end(), [](Process a, Process b)
        { return (a.priority > b.priority); });

    cout << "Order in which processes gets executed \n";

    for (int i = 0; i < n; i++)
        cout << process[i].process_id << " ";
}
```

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```
        averageTime(process);
    }

int main()
{
    vector<Process> process = {Process(1, 10, 2), Process(2, 5, 0),
    Process(3, 8, 1)};

    scheduling(process);

    return 0;
}
```

Output:

```
Order in which processes gets executed
1 3 2
Processes  Burst time  Waiting time  Turn around time
1          10         0           10
3          8         10          18
2          5         18          23

Average waiting time = 9.3333
Average turn around time = 17
```

Round Robin scheduling

```
#include <iostream>
#include <vector>
using namespace std;

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

    int t = 0;

    while (1)
    {
```

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```
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(vector<int> &processes, int n, vector<int> &bt,
vector<int> &wt, vector<int> &tat)
{
    for (int i = 0; i < n; i++)
        tat[i] = bt[i] + wt[i];
}

void findavgTime(vector<int> &processes, int n, vector<int> &bt, int
quantum)
```

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```
{
    int total_wt = 0, total_tat = 0;
    vector<int> wt(n), tat(n);
    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()
{
    vector<int> processes = {1, 2, 3};
    int n = processes.size();

    vector<int> burst_time = {10, 5, 8};

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

Output:

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| 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 | | | |