Scheduler Write Up

**Design Document**

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**Document history**

| **Revision Number** | **Version** | **Revision History** | **Date** |
| --- | --- | --- | --- |
| 1 | 0.1 Beta | Only Round Robin algorithm | 9/30/18 |

**1. Introduction**

This project is made to simulate an operating system by allowing multiple algorithms to be switched out.

**1.1 Purpose**

To be able to simulate an operating system and to allow others to learn how different algorithms effect the system

**1.2 Methodology**

The structure that was chosen to be worked with was the struct. Which allowed us to make an array that had many built in attributes such as duration and completion. By creating an array and allowing the program to loop the amount of processes into completion, the user is able to see the time wasted by a round robin algorithm.

## 2. System needs

### 2.1 CMake and C++

Properties needed to run simulation

CMake version: 3.12

C++ version: C++14

## Testing.

Text.txt run.

Numbers in order:

processNum, need\_time( the time it takes to get to the queue), duration( how much it needs)

1,0,22  
2,0,13  
3,0,47  
4,0,8  
5,0,10  
6,0,16  
7,0,29  
8,0,23  
9,0,45  
10,0,84  
11,0,1

## Output.

The total ms that the processes will need is 298.

Using a quantum of:1

Full time took: 298

Average Response Time: 29.8

Using a quantum of:2

Full time took: 304

Average Response Time: 30.4

Using a quantum of:3

Full time took: 312

Average Response Time: 31.2

Using a quantum of:4

Full time took: 316

Average Response Time: 31.6

Using a quantum of:5

Full time took: 320

Average Response Time: 32

Using a quantum of:6

Full time took: 324

Average Response Time: 32.4

Using a quantum of:7

Full time took: 343

Average Response Time: 34.3

Using a quantum of:8

Full time took: 328

Average Response Time: 32.8

Using a quantum of:9

Full time took: 351

Average Response Time: 35.1

Using a quantum of:10

Full time took: 350

Average Response Time: 35

Using a quantum of:11

Full time took: 363

Average Response Time: 36.3

Using a quantum of:12

Full time took: 348

Average Response Time: 34.8

Using a quantum of:13

Full time took: 364

Average Response Time: 36.4

Using a quantum of:14

Full time took: 378

Average Response Time: 37.8

Using a quantum of:15

Full time took: 375

Average Response Time: 37.5

Using a quantum of:16

Full time took: 368

Average Response Time: 36.8

Using a quantum of:17

Full time took: 374

Average Response Time: 37.4

Using a quantum of:18

Full time took: 396

Average Response Time: 39.6

Using a quantum of:19

Full time took: 418

Average Response Time: 41.8

Using a quantum of:20

Full time took: 440

Average Response Time: 44

Using a quantum of:21

Full time took: 441

Average Response Time: 44.1

Using a quantum of:22

Full time took: 440

Average Response Time: 44

Using a quantum of:23

Full time took: 414

Average Response Time: 41.4

Using a quantum of:24

Full time took: 408

Average Response Time: 40.8

Using a quantum of:25

Full time took: 425

Average Response Time: 42.5

Using a quantum of:26

Full time took: 442

Average Response Time: 44.2

Using a quantum of:27

Full time took: 459

Average Response Time: 45.9

Using a quantum of:28

Full time took: 448

Average Response Time: 44.8

Using a quantum of:29

Full time took: 435

Average Response Time: 43.5

Using a quantum of:30

Full time took: 450

Average Response Time: 45

Using a quantum of:31

Full time took: 465

Average Response Time: 46.5

Using a quantum of:32

Full time took: 480

Average Response Time: 48

Using a quantum of:33

Full time took: 495

Average Response Time: 49.5

Using a quantum of:34

Full time took: 510

Average Response Time: 51

Using a quantum of:35

Full time took: 525

Average Response Time: 52.5

Using a quantum of:36

Full time took: 540

Average Response Time: 54

Using a quantum of:37

Full time took: 555

Average Response Time: 55.5

Using a quantum of:38

Full time took: 570

Average Response Time: 57

Using a quantum of:39

Full time took: 585

Average Response Time: 58.5

Using a quantum of:40

Full time took: 600

Average Response Time: 60

Using a quantum of:41

Full time took: 615

Average Response Time: 61.5

Using a quantum of:42

Full time took: 588

Average Response Time: 58.8

Using a quantum of:43

Full time took: 602

Average Response Time: 60.2

Using a quantum of:44

Full time took: 616

Average Response Time: 61.6

Using a quantum of:45

Full time took: 585

Average Response Time: 58.5

Using a quantum of:46

Full time took: 598

Average Response Time: 59.8

Using a quantum of:47

Full time took: 564

Average Response Time: 56.4

Using a quantum of:48

Full time took: 576

Average Response Time: 57.6

Using a quantum of:49

Full time took: 588

Average Response Time: 58.8

Using a quantum of:50

Full time took: 600

Average Response Time: 60

Using a quantum of:51

Full time took: 612

Average Response Time: 61.2

Using a quantum of:52

Full time took: 624

Average Response Time: 62.4

Using a quantum of:53

Full time took: 636

Average Response Time: 63.6

Using a quantum of:54

Full time took: 648

Average Response Time: 64.8

Using a quantum of:55

Full time took: 660

Average Response Time: 66

Using a quantum of:56

Full time took: 672

Average Response Time: 67.2

Using a quantum of:57

Full time took: 684

Average Response Time: 68.4

Using a quantum of:58

Full time took: 696

Average Response Time: 69.6

Using a quantum of:59

Full time took: 708

Average Response Time: 70.8

Using a quantum of:60

Full time took: 720

Average Response Time: 72

Using a quantum of:61

Full time took: 732

Average Response Time: 73.2

Using a quantum of:62

Full time took: 744

Average Response Time: 74.4

Using a quantum of:63

Full time took: 756

Average Response Time: 75.6

Using a quantum of:64

Full time took: 768

Average Response Time: 76.8

Using a quantum of:65

Full time took: 780

Average Response Time: 78

Using a quantum of:66

Full time took: 792

Average Response Time: 79.2

Using a quantum of:67

Full time took: 804

Average Response Time: 80.4

Using a quantum of:68

Full time took: 816

Average Response Time: 81.6

Using a quantum of:69

Full time took: 828

Average Response Time: 82.8

Using a quantum of:70

Full time took: 840

Average Response Time: 84

Using a quantum of:71

Full time took: 852

Average Response Time: 85.2

Using a quantum of:72

Full time took: 864

Average Response Time: 86.4

Using a quantum of:73

Full time took: 876

Average Response Time: 87.6

Using a quantum of:74

Full time took: 888

Average Response Time: 88.8

Using a quantum of:75

Full time took: 900

Average Response Time: 90

Using a quantum of:76

Full time took: 912

Average Response Time: 91.2

Using a quantum of:77

Full time took: 924

Average Response Time: 92.4

Using a quantum of:78

Full time took: 936

Average Response Time: 93.6

Using a quantum of:79

Full time took: 948

Average Response Time: 94.8

Using a quantum of:80

Full time took: 960

Average Response Time: 96

Using a quantum of:81

Full time took: 972

Average Response Time: 97.2

Using a quantum of:82

Full time took: 984

Average Response Time: 98.4

Using a quantum of:83

Full time took: 996

Average Response Time: 99.6

Using a quantum of:84

Full time took: 924

Average Response Time: 92.4

The quantum with the lowest average response time (29.8) was: 1ms

The most effective millisecond time allotted was of course the 1 ms. As the time allotted became larger, the effect on the run time became more apparent. But in real life performance it would be extremely unlikely for it to be used. This is due to the fact that in our simulator, the scheduler itself does not take any clock cycles to run. Thus, there is no cost for swapping programs. The smaller millisecond times allowed processes to end at a time where the overall throughput was not tampered with in the slightest. But, this would not be effective in real performance as processes enter the queue at any time. Round Robin is good in theory but not the best in practice.