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COIS 3320 Testing Document/Analysis

Generating list of jobs

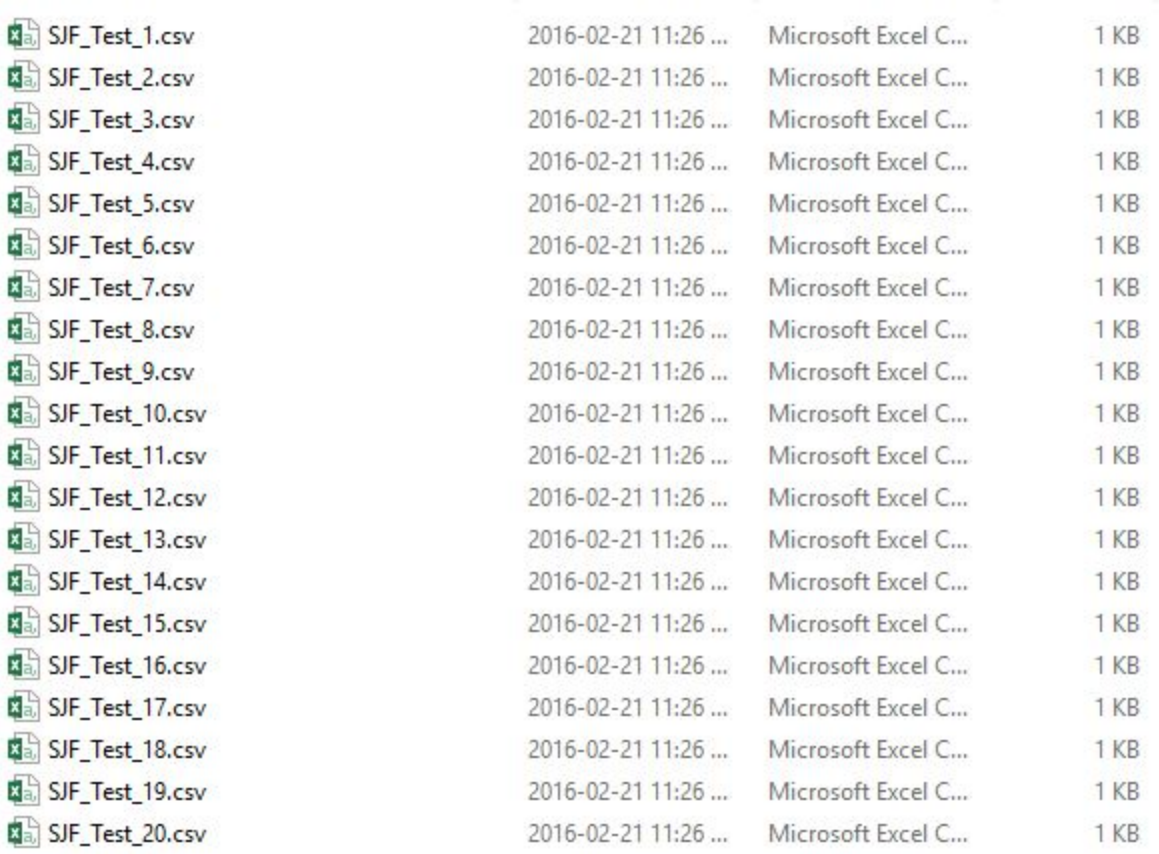
The program successfully generates a list of 10 jobs and randomly assigns run times and arrival times to each one

```
Task Number: 0, Run Time: 37, Arrival Time: 0
Task Number: 1, Run Time: 36, Arrival Time: 5
Task Number: 2, Run Time: 59, Arrival Time: 11
Task Number: 3, Run Time: 10, Arrival Time: 16
Task Number: 4, Run Time: 55, Arrival Time: 21
Task Number: 5, Run Time: 21, Arrival Time: 28
Task Number: 6, Run Time: 46, Arrival Time: 35
Task Number: 7, Run Time: 57, Arrival Time: 42
Task Number: 8, Run Time: 29, Arrival Time: 48
Task Number: 9, Run Time: 9, Arrival Time: 55
```

Generating test files

The program generates test files for each successful test, and drops them in a relative local directory called “Tests”.

```
Test file successfully generated for Tests/SJF_Test_1.csv
Test file successfully generated for Tests/SJF_Test_2.csv
Test file successfully generated for Tests/SJF_Test_3.csv
Test file successfully generated for Tests/SJF_Test_4.csv
Test file successfully generated for Tests/SJF_Test_5.csv
Test file successfully generated for Tests/SJF_Test_6.csv
Test file successfully generated for Tests/SJF_Test_7.csv
Test file successfully generated for Tests/SJF_Test_8.csv
Test file successfully generated for Tests/SJF_Test_9.csv
Test file successfully generated for Tests/SJF_Test_10.csv
Test file successfully generated for Tests/SJF_Test_11.csv
Test file successfully generated for Tests/SJF_Test_12.csv
Test file successfully generated for Tests/SJF_Test_13.csv
Test file successfully generated for Tests/SJF_Test_14.csv
Test file successfully generated for Tests/SJF_Test_15.csv
Test file successfully generated for Tests/SJF_Test_16.csv
Test file successfully generated for Tests/SJF_Test_17.csv
Test file successfully generated for Tests/SJF_Test_18.csv
Test file successfully generated for Tests/SJF_Test_19.csv
Test file successfully generated for Tests/SJF_Test_20.csv
```



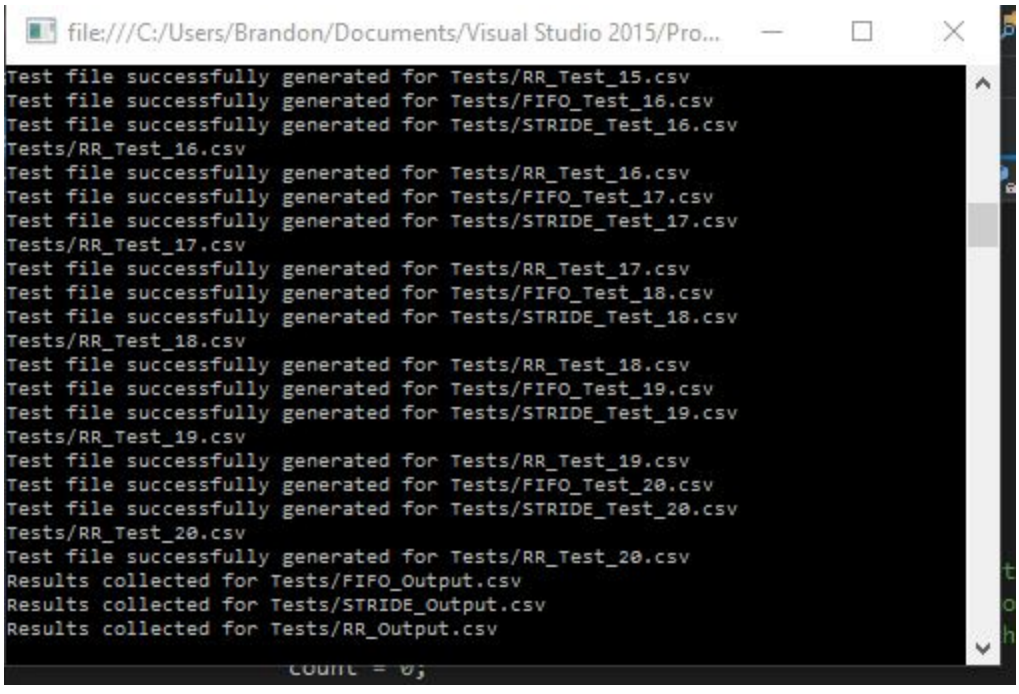
Generating output file

After generating the test files, the program gathers them all together into one formatted CSV file for later graphing use. It also deletes all the previously made test files to keep the folder clean.

```
Test file successfully generated for Tests/SJF_Test_1.csv
Test file successfully generated for Tests/SJF_Test_2.csv
Test file successfully generated for Tests/SJF_Test_3.csv
Test file successfully generated for Tests/SJF_Test_4.csv
Test file successfully generated for Tests/SJF_Test_5.csv
Test file successfully generated for Tests/SJF_Test_6.csv
Test file successfully generated for Tests/SJF_Test_7.csv
Test file successfully generated for Tests/SJF_Test_8.csv
Test file successfully generated for Tests/SJF_Test_9.csv
Test file successfully generated for Tests/SJF_Test_10.csv
Test file successfully generated for Tests/SJF_Test_11.csv
Test file successfully generated for Tests/SJF_Test_12.csv
Test file successfully generated for Tests/SJF_Test_13.csv
Test file successfully generated for Tests/SJF_Test_14.csv
Test file successfully generated for Tests/SJF_Test_15.csv
Test file successfully generated for Tests/SJF_Test_16.csv
Test file successfully generated for Tests/SJF_Test_17.csv
Test file successfully generated for Tests/SJF_Test_18.csv
Test file successfully generated for Tests/SJF_Test_19.csv
Test file successfully generated for Tests/SJF_Test_20.csv
Results collected for Tests/SJF_Output.csv
```

Generating output for multiple algorithms

Screen cap of process successfully generating csv files and concatenating the tests for multiple algorithms into their respective files:



Here are some example tests generated for their respective algorithms:
FIFO: Successfully processes tasks in the order they arrive until completion moving on to the next task until they are all complete.

FIFO Test Results

Test 1

Job#	Arrival Tir	Run Time	Start Time	Time Left	Tickets	Stride	PASS Cou	End Time	Waiting T	Turnaround Time
0	0	33	0	0	150	6	0	33	0	33
1	5	44	34	0	100	10	0	78	29	73
2	11	29	79	0	150	6	0	108	68	97
3	18	8	109	0	100	10	0	117	91	99
4	24	14	118	0	150	6	0	132	94	108
5	29	13	133	0	50	20	0	146	104	117
6	35	18	147	0	50	20	0	165	112	130
7	41	36	166	0	100	10	0	202	125	161
8	47	4	203	0	100	10	0	207	156	160
9	53	8	208	0	50	20	0	216	155	163

Average wait time: 93.4
Average turnaround time: 114.1

Pre-Emptive Shortest Job First: Runs the shortest job first and will allow shorter jobs to arrive and interrupt the current job.

PE-SJF Test Results

Test 1

Job#	Arrival Tir	Run Time	Start Time	Time Left	End Time	Waiting T	Turnaround Time
0	5	5	5	0	10	0	5
1	12	4	12	0	16	0	4
2	25	3	25	0	28	0	3
3	19	12	19	0	36	5	17
4	55	6	55	0	61	0	6
5	45	19	45	0	72	8	27
6	39	36	39	0	104	29	65
7	0	45	0	0	144	99	144
8	50	45	145	0	190	95	140
9	32	49	191	0	240	159	208

Average wait time: 39.5
Average turnaround time: 61.9

Test 2

Job#	Arrival Tir	Run Time	Start Time	Time Left	End Time	Waiting T	Turnaround Time
0	14	21	14	0	35	0	21

Shortest Job First: Runs the shortest job first before moving on to the next shortest job that has arrived.

SJF Test Results

Test 1

Job#	Arrival Tir	Run Time	Start Time	Time Left	End Time	Waiting T	Turnaround Time
0	0	45	0	0	45	0	45
1	25	3	46	0	49	21	24
2	12	4	50	0	54	38	42
3	5	5	55	0	60	50	55
4	55	6	61	0	67	6	12
5	19	12	68	0	80	49	61
6	45	19	81	0	100	36	55
7	39	36	101	0	137	62	98
8	50	45	138	0	183	88	133
9	32	49	184	0	233	152	201

Average wait time: 50.2

Average turnaround time: 72.6

Test 2

Round Robin tests proved successful using time slices of 5,10 and 15 allowing processes a time slice to work on a job until other processes came to take their time slices.

RR_5 Test Results

Test 1

Job#	Arrival Tir	Run Time	Start Time	Time Left	Tickets	Stride	PASS Cou	End Time	Waiting T	Turnaround Time
0	0	4	0	0	200	5	0	4	0	4
1	6	22	6	0	200	5	0	28	0	22
2	51	2	83	0	100	10	0	85	32	34
3	58	9	92	0	100	10	0	138	71	80
4	21	30	35	0	200	5	0	228	177	207
5	13	41	29	0	50	20	0	308	254	295
6	26	46	41	0	100	10	0	346	274	320
7	31	50	47	0	200	5	0	352	271	321
8	37	53	59	0	100	10	0	368	278	331
9	43	52	71	0	150	6	0	371	276	328
Average w	163.3									
Average t	194.2									

RR_10 Test Results

Test 1

Job#	Arrival Tin	Run Time	Start Time	Time Left	Tickets	Stride	PASS Cou	End Time	Waiting T	Turnaround Time
0	0	4	0	0	200	5	0	4	0	4
1	6	22	6	0	200	5	0	96	68	90
2	51	2	119	0	100	10	0	121	68	70
3	58	9	122	0	100	10	0	131	64	73
4	21	30	39	0	200	5	0	197	146	176
5	13	41	17	0	50	20	0	265	211	252
6	26	46	50	0	100	10	0	305	233	279
7	31	50	72	0	200	5	0	316	235	285
8	37	53	83	0	100	10	0	342	252	305
9	43	52	97	0	150	6	0	345	250	302
Average w	152.7									
Average t	183.6									

Test 2

RR_15 Test Results

Test 1

Job#	Arrival Tin	Run Time	Start Time	Time Left	Tickets	Stride	PASS Cou	End Time	Waiting T	Turnaround Time
0	0	4	0	0	200	5	0	4	0	4
1	6	22	6	0	200	5	0	61	33	55
2	51	2	142	0	100	10	0	144	91	93
3	21	30	38	0	200	5	0	160	109	139
4	58	9	161	0	100	10	0	170	103	112
5	13	41	22	0	50	20	0	230	176	217
6	26	46	62	0	100	10	0	312	240	286
7	31	50	78	0	200	5	0	318	237	287
8	37	53	94	0	100	10	0	327	237	290
9	43	52	126	0	150	6	0	335	240	292
Average w	146.6									
Average t	177.5									

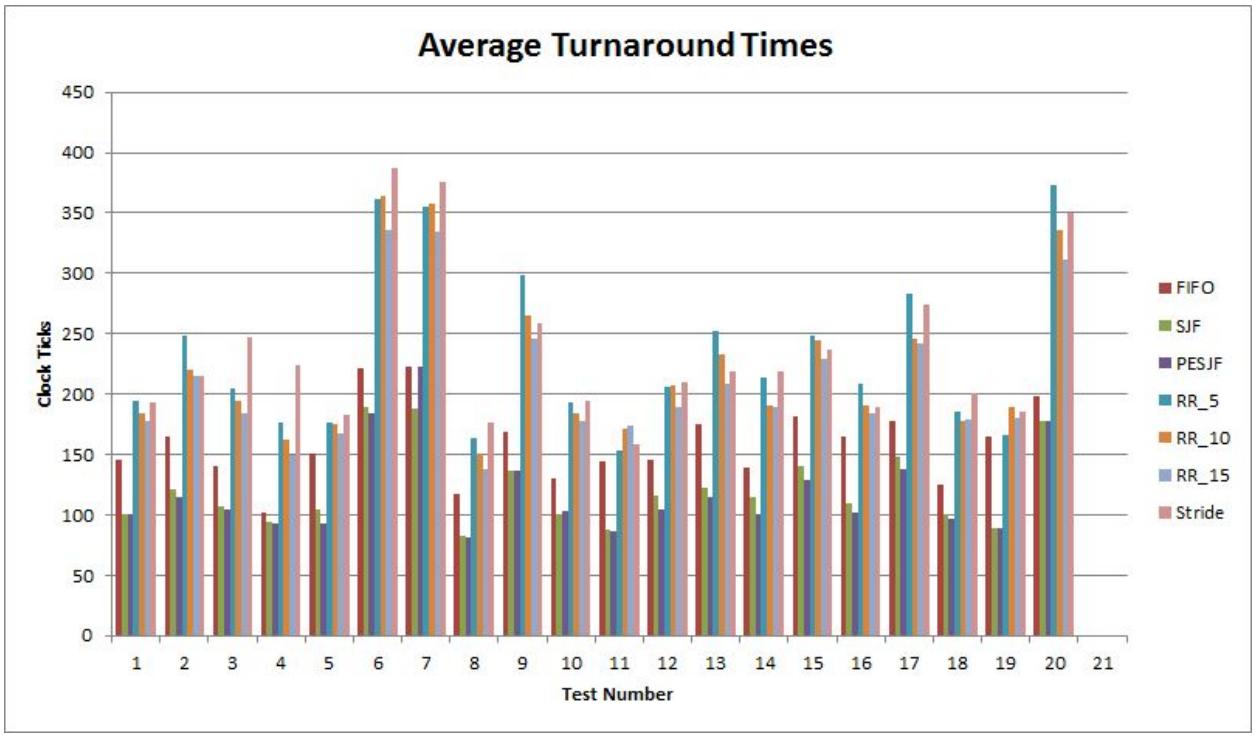
Stride keeps track of pass count and uses the ticket system to prioritize processes.

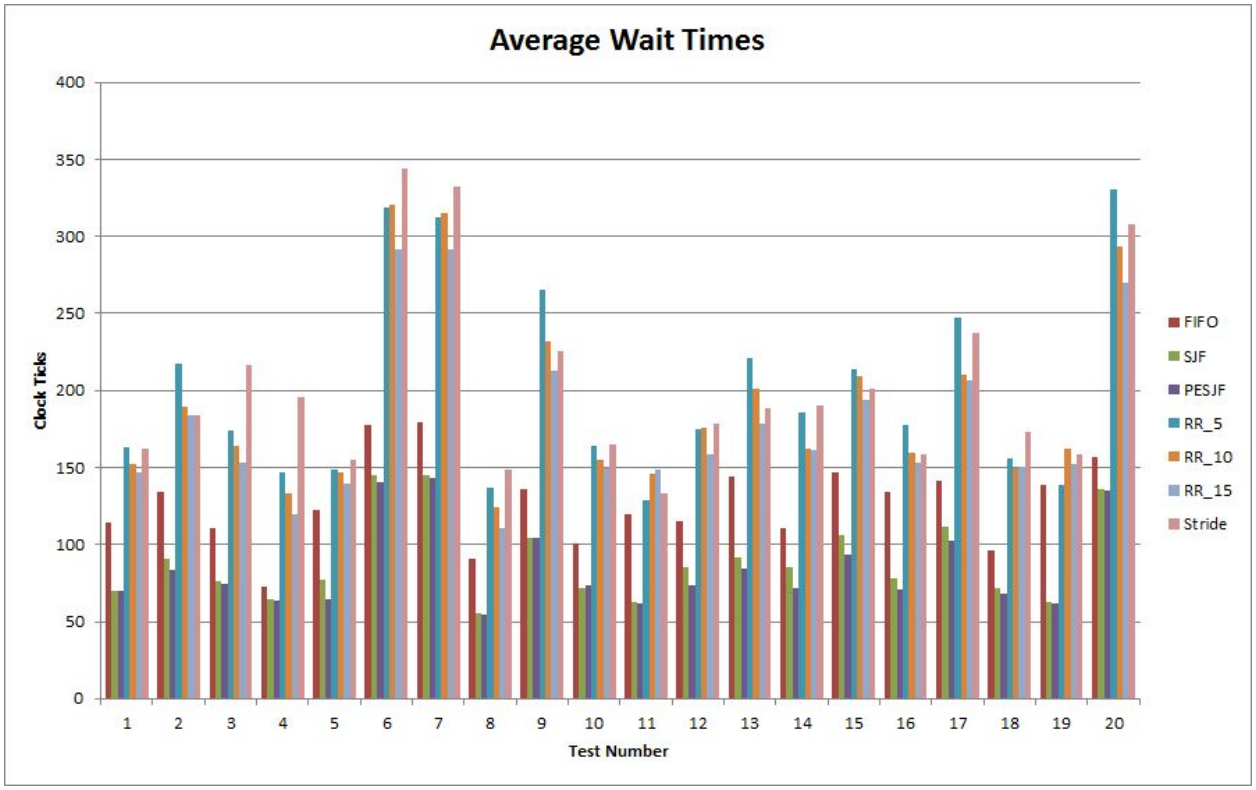
STRIDE Test Results										
Test 1										
Job#	Arrival Tin	Run Time	Start Time	Time Left	Tickets	Stride	PASS Cou	End Time	Waiting T	Turnaround Time
0	0	4	0	0	200	5	20	4	0	4
1	51	2	51	0	100	10	20	53	0	2
2	58	9	58	0	100	10	100	110	43	52
3	6	22	6	0	200	5	130	178	150	172
4	21	30	21	0	200	5	170	196	145	175
5	31	50	31	0	200	5	290	277	196	246
6	43	52	43	0	150	6	372	316	221	273
7	26	46	26	0	100	10	540	349	277	323
8	37	53	37	0	100	10	620	359	269	322
9	13	41	13	0	50	20	920	376	322	363
Average w	162.3									
Average t	193.2									

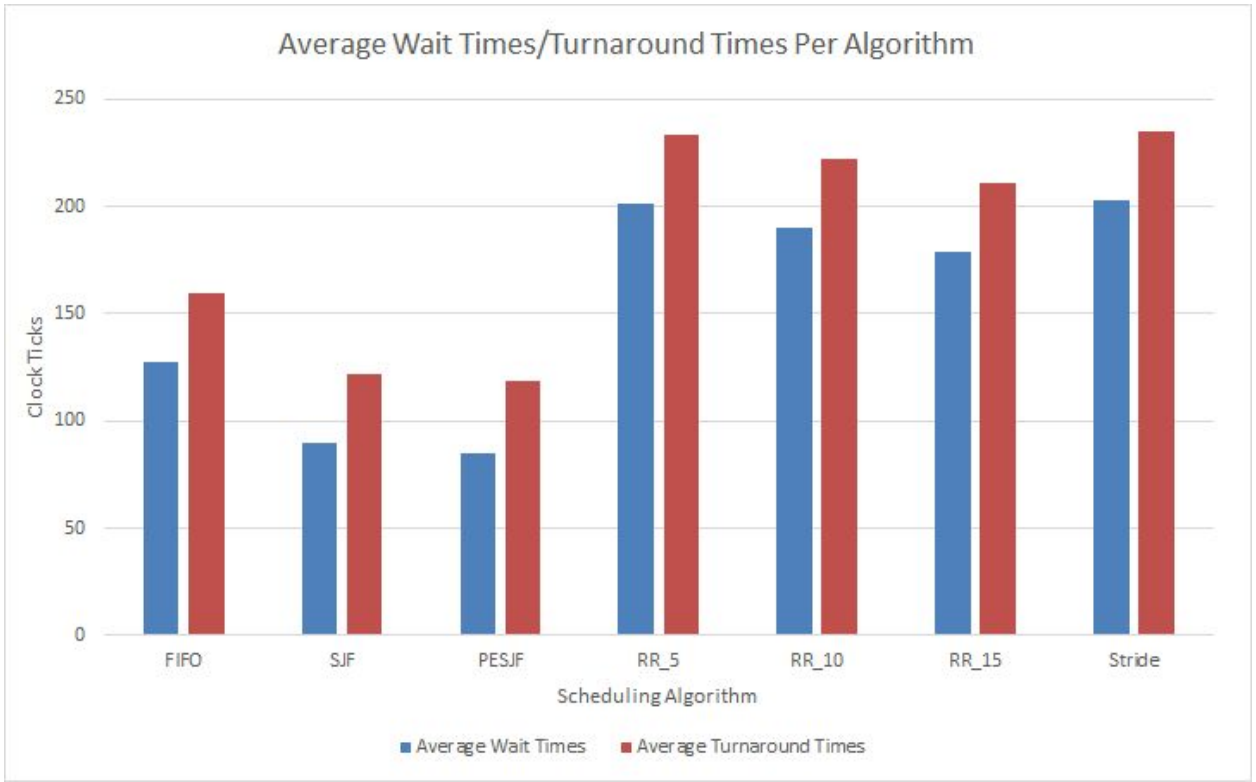
Analysis

Based on the graphs, the results show that the best average wait times and turnaround times go to Pre-Emptive Shortest Job First, only slightly beating regular Shortest Job First. It is worth noting that the graphs hide the advantage of using Stride, which is its ability to prioritize tasks that the system deems important. Looking through some of the results, prioritized tasks are completed sooner than in other algorithms, though the overall wait times and turnaround times still lag behind PE-SJF and SJF.

Regardless, our recommendation goes to PE-SJF as it allows for interrupts to truly complete the shortest job first compared to SJF. While long tasks may take forever to complete if newer shorter tasks continue to arrive, the numbers do not lie.




Average Wait Times
Clock Ticks
Test Number
FIFO
SJF
PESJF
RR_5
RR_10
RR_15
Stride


Average Wait Times/Turnaround Times Per Algorithm
Clock Ticks
FIFO
SJF
PESJF
RR_5
RR_10
RR_15
Stride
Scheduling Algorithm
Average Wait Times
Average Turnaround Times