CS 433 Assignment 3

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List of files:

main.cpp → *file that tests the simulation*

event.cpp – source file → *event used in an event queue implementation*
event.h – header file

process.cpp – source file → *process used in a ready queue implementation*
process.h – header file

random.cpp – source file → *used for generation of random numbers*
random.h – header file

simulation.cpp – source file → *discrete event simulation implementation*
simulation.h – header file

FCFS.cpp – source file → *FCFS implementation*
FCFS.h – header file

SJF.cpp – source file → *SJF implementation*
SJF.h – header file

makefile – two important commands:
make all (compiles program and creates executable)
make clean (removes object files)

sim – program executable

Program Instructions: Run the program by typing in the following
./sim <x> <y>
x: # of processes
y: scheduling type (1 = FCFS, 2= SJF)

NOTE: If you just run the program without entering any arguments, then a prompt will ask the user to input the two required arguments to begin the simulation

FCFS vs SJF Analysis:

FCFS

# of processes	**10**	**20**	**100**
Jobs completed	4	7	0
CPU utilization	64.24%	96.99%	99.50%
Throughput	0.013 jobs/sec	0.023 jobs/sec	0.000 jobs/sec
Avg turnaround time	51.92 seconds	121.05 seconds	0.00 seconds
Avg wait time	45.55 seconds	89.77 seconds	139.34 seconds

SJF

# of processes	**10**	**20**	**100**
Jobs completed	4	5	1
CPU utilization	64.27%	96.99%	99.50%
Throughput	0.013 jobs/sec	0.017 jobs/sec	0.003 jobs/sec
Avg turnaround time	50.72 seconds	137.32 seconds	7.67 seconds
Avg wait time	45.47 seconds	67.96 seconds	21.45 seconds

According to the above data, we can see that the number of jobs completed is the same for 10 processes. However, FCFS has 2 more jobs completed for 20 processes and 1 less job completed for 100 processes. The CPU utilization remains virtually the same across both scheduling algorithms. The average turnaround time for 10 processes is almost the same for both algorithms however for 20 and 100 processes SJF has the higher turnaround time. The average wait time is the same for 10 processes, but FCFS has a higher average wait time and a significantly higher average wait time for 100 processes.