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Assignment#2

DEGREE OF SUCCESS: 100%

In my opinion, my degree of success for this assignment is 100%.
I made project_header.h, pro_scope.c for one random single core and sys_scope.c for multiple cores. Then, I compiled them with Makefile as pctproc and pctsys to connect and run with a process_scope and system_scope shell file respectively without any compilation error. The main difference between pro_scope.c and sys_scope.c is the set mask for single CPU for all threads (main function part) vs for each threads (producers and consumer code part).

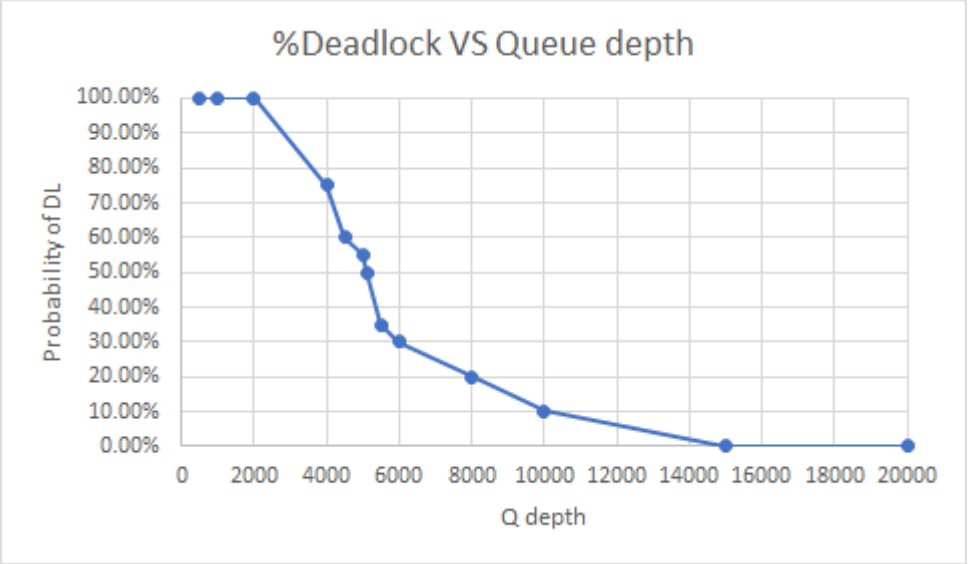
First, I ran process_scope.sh and system_scope.sh programs on the mercury1 system which provides 8 schedulable cores with the initial configuration. The process_scope.sh program confines all threads to share a single core, but the system_scope.sh deploy the threads across all the available cores. So, the average execution time of using a single core is 9.334 while the average execution time of using multiple cores is 5.494. In the case of generating some part files, I observed that using a single core takes more time than using multiple cores, from this experiment almost 2 times more than using multiple cores.

Second, I submitted first 10 dozens donuts of #9th, #19th, #29th, #39th and #49th consumer. I also provided the probability of deadlock vs queue depth graph which is close to linear. I observed that the higher the queue depth, the lower the chance of getting a deadlock. This experiment was similar to assignment1.

Lastly, **my 50% deadlock queue size is 5100**. I used the 5100th queue size depth when collecting data from each dozen donuts. I ran with 5 configurations which are 5000, 10000, 20000, 25000 and 30000 dozens. I observed the higher the number of donut dozens, the higher chance of getting deadlock.

1. The probability of deadlock VS Queue depth

Queue depth	%Deadlock
500	100.00%
1000	100.00%
2000	100.00%
4000	75.00%
4500	60.00%
5000	55.00%
5100	50.00%
5500	35.00%
6000	30.00%
8000	20.00%
10000	10.00%
15000	0.00%
20000	0.00%



2. The probability of deadlock VS Number of donut dozens

Queue depth	5100
#Dozen	%Deadlock
5000	0.00%
10000	20.00%
15000	35.00%
20000	50.00%
25000	60.00%
30000	100.00%