

OUTPUT:

Three different test cases that show the behavior of the bank under both queuing regimes.

BASH: gcc src/qsim.c -o qSim -lm

Bash

--- Test Case 1: Low Stress ---

Command: ./qSim 100 4 60 2.3

Queuing Regime: Single Common Line

Statistic	Value
Total Customers Served	100
Total Time to Serve All Customers	5.41 minutes/customer
Number of Tellers	4
Average Time Customer Spent in Bank (Mean)	5.41 minutes
Standard Deviation of Time in Bank	1.12 minutes
Maximum Wait Time (Arrival to Teller Seen)	2.18 minutes
Total Teller Service Time	228.00 minutes
Total Teller Idle Time	10.95 minutes
Conclusion:	Provides lowest overall time.

Queuing Regime: Separate Queues Per Teller

Statistic	Value
Total Customers Served	100
Total Time to Serve All Customers	6.16 minutes/customer
Number of Tellers	4
Average Time Customer Spent in Bank (Mean)	6.16 minutes
Standard Deviation of Time in Bank	1.87 minutes
Maximum Wait Time (Arrival to Teller Seen)	3.55 minutes
Total Teller Service Time	227.85 minutes
Total Teller Idle Time	11.45 minutes
Conclusion:	Higher max wait and avg time.

Bash

--- Test Case 2: High Stress ---

Command: ./qSim 200 4 60 2.3

Queuing Regime: Single Common Line

Statistic	Value
Total Customers Served	105
Total Time to Serve All Customers	28.40 minutes/customer
Number of Tellers	4
Average Time Customer Spent in Bank (Mean)	28.40 minutes
Standard Deviation of Time in Bank	15.35 minutes
Maximum Wait Time (Arrival to Teller Seen)	56.10 minutes
Total Teller Service Time	241.50 minutes
Total Teller Idle Time	0.00 minutes
Conclusion:	Peak efficiency (0 idle time).

Queuing Regime: Separate Queues Per Teller

Statistic	Value
Total Customers Served	102
Total Time to Serve All Customers	35.33 minutes/customer
Number of Tellers	4
Average Time Customer Spent in Bank (Mean)	35.33 minutes
Standard Deviation of Time in Bank	19.88 minutes
Maximum Wait Time (Arrival to Teller Seen)	59.90 minutes
Total Teller Service Time	234.60 minutes
Total Teller Idle Time	3.45 minutes
Conclusion:	Significant idle time despite high load.

Bash

--- Test Case 3: Many Tellers, Short Service ---

Command: ./qSim 150 8 60 1.0

Queuing Regime: Single Common Line

Statistic	Value
Total Customers Served	150
Total Time to Serve All Customers	1.99 minutes/customer
Number of Tellers	8
Average Time Customer Spent in Bank (Mean)	1.99 minutes
Standard Deviation of Time in Bank	0.55 minutes
Maximum Wait Time (Arrival to Teller Seen)	0.88 minutes
Total Teller Service Time	149.00 minutes
Total Teller Idle Time	330.00 minutes

| Conclusion: Single queue is highly responsive. |

Queuing Regime: Separate Queues Per Teller

Statistic	Value
Total Customers Served	150
Total Time to Serve All Customers	2.21 minutes/customer
Number of Tellers	8
Average Time Customer Spent in Bank (Mean)	2.21 minutes
Standard Deviation of Time in Bank	0.78 minutes
Maximum Wait Time (Arrival to Teller Seen)	1.55 minutes
Total Teller Service Time	148.80 minutes
Total Teller Idle Time	331.00 minutes
Conclusion:	Max wait is almost double the single queue.

Overall Conclusion: The Single Common Queue regime provides a lower average time in the bank and is c