Lab 1: Multi-tasked Food Distribution

Sept 19th, 2022

William Pearce

COSC 3319

Section 01

MWF

“C” Option

**“D-“ Requirements:**

Final Result:

[bill@Manjaro-HP DSA-Lab-1]$ ./bin/productdistributionmain < Data.txt > res1.txt

In file result-3-1-2.txt:

How many Product Generators?

How many points of sale?

B delivered.

GateKeeper insert accepted RICE B

Next grain shipment arrives 5.66092E-02 Time units!

B delivered.

GateKeeper insert accepted RICE B

Next grain shipment arrives 9.14843E-02 Time units!

B delivered.

Rejected by GateKeeper:

SQUASH B

Rejected = 1. Sent to another distribution facility!

Next grain shipment arrives 4.34619E-01 Time units!

...

Retail Sales successfuly sold STEAK M

FOWEL M Removed by GateKeeper for shipment.

B delivered.

Retail Sales successfuly sold WHEAT B

Retail Sales successfuly sold FOWEL M

GateKeeper insert accepted WHEAT B

Next grain shipment arrives 6.39829E-01 Time units!

WHEAT B Removed by GateKeeper for shipment.

M delivered.

GateKeeper insert accepted FOWEL M

Next grain shipment arrives 1.97321E-01 Time units!

Retail Sales successfuly sold WHEAT B

B delivered.

Hours of operation prior to closing: 40.367263000

Meat Packs Processed: 4

Non-meat Packs Processed: 9

Total Packets Processed: 13

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Queue Size | # of Gen | # of POS | Total food packs | Meat packs | Non-meat packs | sales |
| 10 | 1 | 1 | 10 | 2 | 8 | 10 |
| 10 | 1 | 2 | 13 | 2 | 11 | 13 |
| 10 | 1 | 3 | 16 | 4 | 12 | 19 |
| 10 | 1 | 4 | 15 | 4 | 11 | 21 |
| 10 | 2 | 1 | 3 | 0 | 3 | 3 |
| 10 | 2 | 2 | 13 | 2 | 11 | 13 |
| 10 | 2 | 3 | 13 | 2 | 11 | 13 |
| 10 | 2 | 4 | 13 | 2 | 11 | 13 |
| 10 | 3 | 1 | 3 | 0 | 3 | 3 |
| 10 | 3 | 2 | 3 | 0 | 3 | 3 |
| 10 | 3 | 3 | 3 | 0 | 3 | 3 |
| 10 | 3 | 4 | 3 | 0 | 3 | 3 |
| 15 | 3 | 4 | 3 | 0 | 3 | 3 |
| 20 | 3 | 4 | 3 | 0 | 3 | 3 |
| 5 | 1 | 2 | 13 | 3 | 10 | 13 |
| 4 | 1 | 2 | 13 | 4 | 9 | 13 |
| 3 | 1 | 2 | 13 | 4 | 9 | 13 |
| 2 | 1 | 2 | 5 | 2 | 3 | 7 |

In order to determine the minimum queue size to get the maximum number of sales, I first determined which combination of product generators and points of sale would result in the most sales. Highlighted in read are sales numbers that are likely the result of a race condition between the sales threads, since they are greater than the total number of packets processed. After excluding the race condition cases,