

## producer-consumer-project

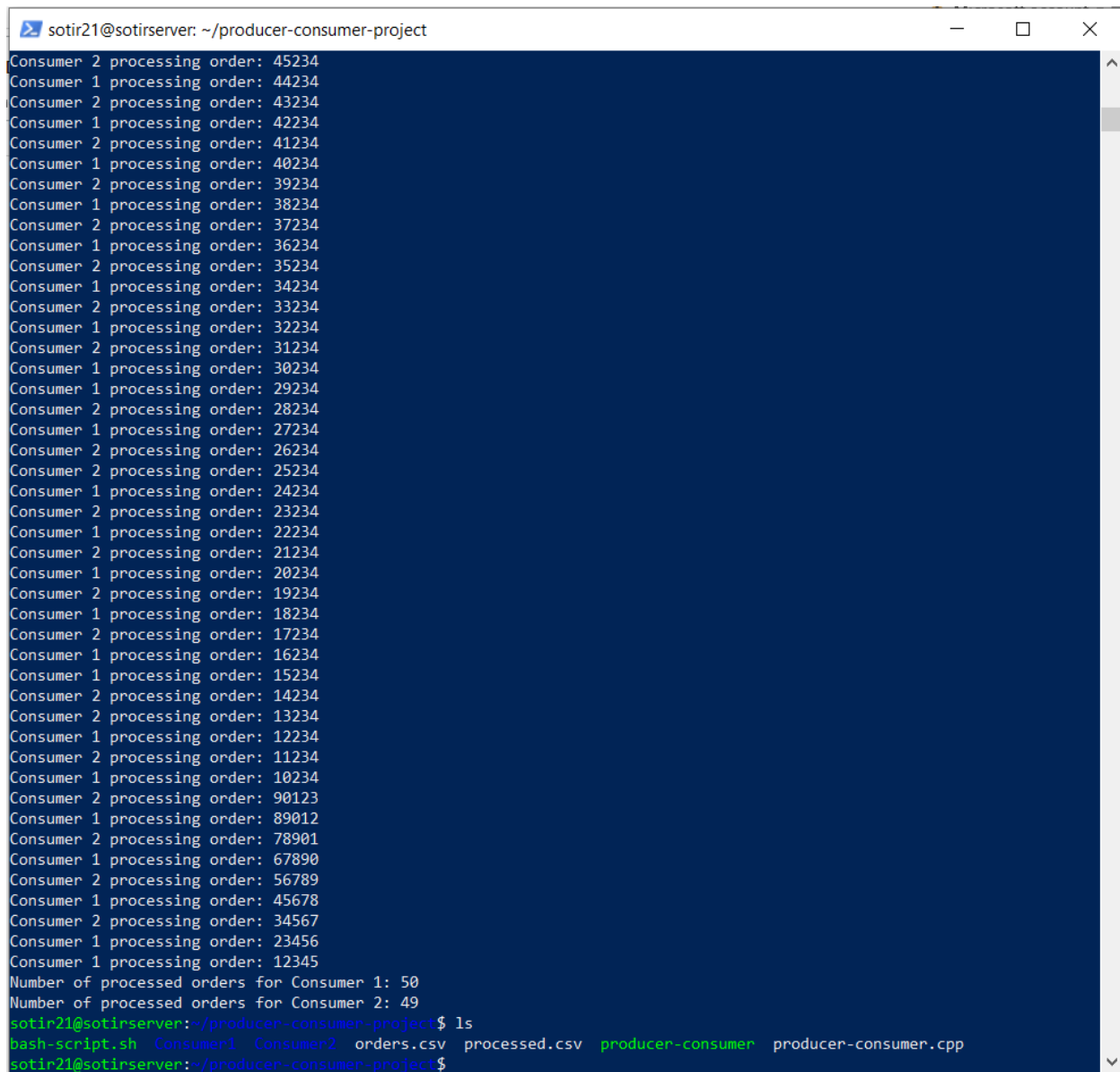
1. **mkdir producer-consumer-project** : creating new directory in Ubuntu environment for the project
2. **cd producer-consumer-project**: changing directions so we can enter inside the producer-consumer-project directory that we just created
3. **nano producer-consumer.cpp** : creating new file where we are going to enter the corrected version of C++ code, where I have applied pthread mutex for lock and unlock
4. **nano orders.csv** : creating a new file for the orders.csv where we enter the orders as a text taken from the attached files sent in the classroom

```
sotir21@sotirserver: ~/producer-consumer-project
Last login: Fri Apr 26 16:39:24 2024 from 10.0.2.2
sotir21@sotirserver:~$ ls
Desktop  pg100.txt
sotir21@sotirserver:~$ mkdir producer-consumer-project
sotir21@sotirserver:~$ cd producer-consumer-project
sotir21@sotirserver:~/producer-consumer-project$ nano producer-consumer.cpp
sotir21@sotirserver:~/producer-consumer-project$ nano orders.csv
sotir21@sotirserver:~/producer-consumer-project$ nano bash-script.sh
sotir21@sotirserver:~/producer-consumer-project$ sotir21@sotirserver:~/producer-consumer-project$
sotir21@sotirserver:~/producer-consumer-project$ chmod +x bash-script.sh
sotir21@sotirserver:~/producer-consumer-project$ ./ bash-script.sh
-bash: ./: Is a directory
sotir21@sotirserver:~/producer-consumer-project$ ./bash-script.sh
Error parsing line:

Consumer 1 processing order: 99234
Consumer 2 processing order: 98234
Consumer 1 processing order: 97234
Consumer 2 processing order: 96234
Consumer 1 processing order: 95234
Consumer 2 processing order: 94234
Consumer 1 processing order: 93234
Consumer 2 processing order: 92234
Consumer 1 processing order: 91234
Consumer 2 processing order: 90234
Consumer 1 processing order: 89234
Consumer 2 processing order: 88234
Consumer 1 processing order: 87234
Consumer 2 processing order: 86234
Consumer 1 processing order: 85234
Consumer 2 processing order: 84234
Consumer 1 processing order: 83234
Consumer 2 processing order: 82234
Consumer 2 processing order: 81234
Consumer 1 processing order: 80234
Consumer 1 processing order: 79234
Consumer 2 processing order: 78234
Consumer 2 processing order: 77234
Consumer 1 processing order: 76234
Consumer 2 processing order: 75234
Consumer 1 processing order: 74234
Consumer 2 processing order: 73234
Consumer 1 processing order: 72234
Consumer 2 processing order: 71234
Consumer 1 processing order: 70234
Consumer 2 processing order: 69234
Consumer 1 processing order: 68234
Consumer 2 processing order: 67234
Consumer 1 processing order: 66234
```

5. **nano bash-script.sh** : creating a new file where we are going to enter the bash code
6. **chmod +x bash-script.sh**: making the bash script executable
7. **./bash-script.sh** : executing the script

## Screenshots provided:



```
sotir21@sotirserver: ~/producer-consumer-project
Consumer 2 processing order: 45234
Consumer 1 processing order: 44234
Consumer 2 processing order: 43234
Consumer 1 processing order: 42234
Consumer 2 processing order: 41234
Consumer 1 processing order: 40234
Consumer 2 processing order: 39234
Consumer 1 processing order: 38234
Consumer 2 processing order: 37234
Consumer 1 processing order: 36234
Consumer 2 processing order: 35234
Consumer 1 processing order: 34234
Consumer 2 processing order: 33234
Consumer 1 processing order: 32234
Consumer 2 processing order: 31234
Consumer 1 processing order: 30234
Consumer 1 processing order: 29234
Consumer 2 processing order: 28234
Consumer 1 processing order: 27234
Consumer 2 processing order: 26234
Consumer 2 processing order: 25234
Consumer 1 processing order: 24234
Consumer 2 processing order: 23234
Consumer 1 processing order: 22234
Consumer 2 processing order: 21234
Consumer 1 processing order: 20234
Consumer 2 processing order: 19234
Consumer 1 processing order: 18234
Consumer 2 processing order: 17234
Consumer 1 processing order: 16234
Consumer 1 processing order: 15234
Consumer 2 processing order: 14234
Consumer 2 processing order: 13234
Consumer 1 processing order: 12234
Consumer 2 processing order: 11234
Consumer 1 processing order: 10234
Consumer 2 processing order: 90123
Consumer 1 processing order: 89012
Consumer 2 processing order: 78901
Consumer 1 processing order: 67890
Consumer 2 processing order: 56789
Consumer 1 processing order: 45678
Consumer 2 processing order: 34567
Consumer 1 processing order: 23456
Consumer 1 processing order: 12345
Number of processed orders for Consumer 1: 50
Number of processed orders for Consumer 2: 49
sotir21@sotirserver:~/producer-consumer-project$ ls
bash-script.sh  Consumer1  Consumer2  orders.csv  processed.csv  producer-consumer  producer-consumer.cpp
sotir21@sotirserver:~/producer-consumer-project$
```

## bash-script.sh

```
sotir21@sotirserver: ~/producer-consumer-project
GNU nano 6.2 bash-script.sh
#!/bin/bash

# 2.1 Compile producer-consumer.cpp file
g++ -o producer-consumer producer-consumer.cpp -lpthread

# 2.2 Execute the binary
./producer-consumer

# 2.3 Create folders named Consumer1 and Consumer2
mkdir -p Consumer1 Consumer2

# 2.4 Separate orders of Consumer1 and Consumer2 and save them in respective folders
grep ',1,[0-9][0-9][0-9]-' processed.csv > Consumer1/orders_consumer1.csv
grep ',2,[0-9][0-9][0-9][0-9]-' processed.csv > Consumer2/orders_consumer2.csv

# 2.5 Print the number of processed orders of each consumer
num_orders_consumer1=$(wc -l < Consumer1/orders_consumer1.csv)
num_orders_consumer2=$(wc -l < Consumer2/orders_consumer2.csv)

echo "Number of processed orders for Consumer 1: $num_orders_consumer1"
echo "Number of processed orders for Consumer 2: $num_orders_consumer2"
```

[ Read 22 lines ]

^G Help	^O Write Out	^W Where Is	^K Cut	^T Execute	^C Location	M-U Undo	M-A Set Mark
^X Exit	^R Read File	^N Replace	^U Paste	^J Justify	^_ Go To Line	M-E Redo	M-G Copy

## orders.csv

```
sotir21@sotirserver: ~/producer-consumer-project
GNU nano 6.2 orders.csv
12345,Product1,5,200
23456,Product2,7,350
34567,Product3,2,150
45678,Product4,4,400
56789,Product5,8,100
67890,Product6,3,250
78901,Product7,6,300
89012,Product8,1,500
90123,Product9,9,600
10234,Product10,10,700
11234,Product11,5,200
12234,Product12,7,350
13234,Product13,2,150
14234,Product14,4,400
15234,Product15,8,100
16234,Product16,3,250
17234,Product17,6,300
18234,Product18,1,500
19234,Product19,9,600
20234,Product20,10,700
21234,Product21,5,200
22234,Product22,7,350
23234,Product23,2,150
24234,Product24,4,400
25234,Product25,8,100
26234,Product26,3,250
27234,Product27,6,300
28234,Product28,1,500
29234,Product29,9,600
30234,Product30,10,700
31234,Product31,5,200
32234,Product32,7,350
33234,Product33,2,150
34234,Product34,4,400
35234,Product35,8,100
36234,Product36,3,250
37234,Product37,6,300
38234,Product38,1,500
39234,Product39,9,600
40234,Product40,10,700
41234,Product41,5,200
42234,Product42,7,350
43234,Product43,2,150
44234,Product44,4,400
45234,Product45,8,100
46234,Product46,3,250
[ Read 100 lines ]
^G Help      ^O Write Out  ^W Where Is   ^K Cut        ^T Execute
^X Exit      ^R Read File  ^\ Replace    ^U Paste      ^J Justify
^C Location   M-U Undo      M-A Set Mark
^_ Go To Line M-E Redo      M-6 Copy
```

## processed.csv

```
sotir21@sotirserver: ~/producer-consumer-project
GNU nano 6.2 processed.csv
99234,Product99,9,600.00,2024-04-26 16:51:07,1,2024-04-26 16:51:07
98234,Product98,1,500.00,2024-04-26 16:51:07,2,2024-04-26 16:51:07
97234,Product97,6,300.00,2024-04-26 16:51:07,1,2024-04-26 16:51:07
96234,Product96,3,250.00,2024-04-26 16:51:07,2,2024-04-26 16:51:07
95234,Product95,8,100.00,2024-04-26 16:51:07,1,2024-04-26 16:51:07
94234,Product94,4,400.00,2024-04-26 16:51:07,2,2024-04-26 16:51:07
93234,Product93,2,150.00,2024-04-26 16:51:07,1,2024-04-26 16:51:07
92234,Product92,7,350.00,2024-04-26 16:51:07,2,2024-04-26 16:51:07
91234,Product91,5,200.00,2024-04-26 16:51:07,1,2024-04-26 16:51:08
90234,Product90,10,700.00,2024-04-26 16:51:07,2,2024-04-26 16:51:08
89234,Product89,9,600.00,2024-04-26 16:51:07,1,2024-04-26 16:51:08
88234,Product88,1,500.00,2024-04-26 16:51:07,2,2024-04-26 16:51:08
87234,Product87,6,300.00,2024-04-26 16:51:07,1,2024-04-26 16:51:08
86234,Product86,3,250.00,2024-04-26 16:51:07,2,2024-04-26 16:51:08
85234,Product85,8,100.00,2024-04-26 16:51:07,1,2024-04-26 16:51:08
84234,Product84,4,400.00,2024-04-26 16:51:07,2,2024-04-26 16:51:08
83234,Product83,2,150.00,2024-04-26 16:51:07,1,2024-04-26 16:51:08
82234,Product82,7,350.00,2024-04-26 16:51:07,2,2024-04-26 16:51:08
81234,Product81,5,200.00,2024-04-26 16:51:07,2,2024-04-26 16:51:08
80234,Product80,10,700.00,2024-04-26 16:51:07,1,2024-04-26 16:51:08
79234,Product79,9,600.00,2024-04-26 16:51:07,1,2024-04-26 16:51:08
78234,Product78,1,500.00,2024-04-26 16:51:07,2,2024-04-26 16:51:08
77234,Product77,6,300.00,2024-04-26 16:51:07,2,2024-04-26 16:51:08
76234,Product76,3,250.00,2024-04-26 16:51:07,1,2024-04-26 16:51:08
75234,Product75,8,100.00,2024-04-26 16:51:07,2,2024-04-26 16:51:08
74234,Product74,4,400.00,2024-04-26 16:51:07,1,2024-04-26 16:51:08
73234,Product73,2,150.00,2024-04-26 16:51:07,2,2024-04-26 16:51:09
72234,Product72,7,350.00,2024-04-26 16:51:07,1,2024-04-26 16:51:09
71234,Product71,5,200.00,2024-04-26 16:51:07,2,2024-04-26 16:51:09
70234,Product70,10,700.00,2024-04-26 16:51:07,1,2024-04-26 16:51:09
69234,Product69,9,600.00,2024-04-26 16:51:07,2,2024-04-26 16:51:09
68234,Product68,1,500.00,2024-04-26 16:51:07,1,2024-04-26 16:51:09
67234,Product67,6,300.00,2024-04-26 16:51:07,2,2024-04-26 16:51:09
66234,Product66,3,250.00,2024-04-26 16:51:07,1,2024-04-26 16:51:09
65234,Product65,8,100.00,2024-04-26 16:51:07,2,2024-04-26 16:51:09
64234,Product64,4,400.00,2024-04-26 16:51:07,1,2024-04-26 16:51:09
63234,Product63,2,150.00,2024-04-26 16:51:07,2,2024-04-26 16:51:09
62234,Product62,7,350.00,2024-04-26 16:51:07,1,2024-04-26 16:51:09
61234,Product61,5,200.00,2024-04-26 16:51:07,2,2024-04-26 16:51:09
60234,Product60,10,700.00,2024-04-26 16:51:07,1,2024-04-26 16:51:09
59234,Product59,9,600.00,2024-04-26 16:51:07,2,2024-04-26 16:51:09
58234,Product58,1,500.00,2024-04-26 16:51:07,1,2024-04-26 16:51:09
57234,Product57,6,300.00,2024-04-26 16:51:07,2,2024-04-26 16:51:09
56234,Product56,3,250.00,2024-04-26 16:51:07,1,2024-04-26 16:51:09
55234,Product55,8,100.00,2024-04-26 16:51:07,2,2024-04-26 16:51:09
54234,Product54,4,400.00,2024-04-26 16:51:07,1,2024-04-26 16:51:09
[ Read 99 lines ]
^G Help      ^O Write Out  ^W Where Is   ^K Cut        ^T Execute    ^C Location   M-U Undo      M-A Set Mark
^X Exit      ^R Read File  ^_ Replace    ^U Paste      ^J Justify    ^_ Go To Line M-E Redo      M-G Copy
```

**producer-consumer (binary)**

[illegible]

## producer-consumer.cpp

```
sotir21@sotirserver: ~/producer-consumer-project
GNU nano 6.2 producer-consumer.cpp
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include <pthread.h>
#include <time.h>
#include <chrono>
#include <thread>

const int max_orders = 100;
const int max_order_length = 200;

typedef struct {
    int order_number;
    char product_name[50];
    int quantity;
    float sum;
    char producer_timestamp[20];
    char consumer_id[5];
    char consumer_timestamp[20];
} Order;

Order orders[max_orders];
int order_count = 0;
pthread_mutex_t mutex = PTHREAD_MUTEX_INITIALIZER;

void getTimestamp(char *timestamp) {
    time_t current_time;
    time(&current_time);
    struct tm *local_time = localtime(&current_time);
    strftime(timestamp, 20, "%Y-%m-%d %H:%M:%S", local_time);
}

void sleepMilliseconds(int milliseconds) {
    std::this_thread::sleep_for(std::chrono::milliseconds(milliseconds));
}

void *producer(void *arg) {
    FILE *file = fopen("orders.csv", "r");
    if (!file) {
        perror("Error opening file");
        exit(EXIT_FAILURE);
    }

    char line[max_order_length];
    while (fgets(line, sizeof(line), file)) {
        pthread_mutex_lock(&mutex);

```

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