CSE-344 SYSTEMS PROGRAMMING
HOMEWORK 5 REPORT

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In this homework, we were supposed to to develop a multi-threaded application using p-threads for flower delivery.

Firstly, I read the given file and store all the information in the related structs. Then, I created a thread pool with the given number of florists. After creation the threads, whenever a client is read, a thread that fits the conditions is assigned to the client. This loop continues until all the clients are assigned to a thread.

Chebyshev distance is used to determine the appropriate thread. If a thread is busy with delivery, then the request is assigned to that thread but client waits for its turn. The thread waits for preparation + time of delivery time. Speed and distance are used to calculate the delivery time. Preparation time is a random number between 1-250 ms.

Chebyshev distance formula is MAX(abs(x2-x1), abs(y2-y1))

After all florist threads' termination and their sale statistics are printed on the screen.

In case of a **SIGINT** signal, all threads terminate and all resources are deallocated and an informative message is printed.

This project is compiled with ***-Wall –pedantic-errors*** and compiled successfully.

Example usage is: **$floristApp -i /*path*/to/the/file**

The output of the test with the given file is shown below.

```
emire@emire-X555LN:~/Desktop$ make clean && make && ./1 -i data.dat
rm -f 1 1.o
gcc -o 1 1.c -lrt -pthread -Wall --pedantic-errors
Florist application initializing from file: data.dat
3 florists have been created.
Processing requests
Florist Murat has delivered a orchid to client1 in 206.1 ms
Florist Ayse has delivered a orchid to client4 in 203.7 ms
Florist Murat has delivered a daffodil to client3 in 207.9 ms
Florist Ayse has delivered a orchid to client6 in 204.3 ms
Florist Ayse has delivered a rose to client7 in 207.7 ms
Florist Fatma has delivered a clove to client2 in 212.4 ms
Florist Ayse has delivered a rose to client8 in 214.3 ms
Florist Murat has delivered a violet to client5 in 223.4 ms
Florist Fatma has delivered a rose to client9 in 206.2 ms
Florist Murat has delivered a orchid to client11 in 210.6 ms
Florist Ayse has delivered a violet to client10 in 213.7 ms
Florist Fatma has delivered a clove to client13 in 210.8 ms
Florist Murat has delivered a violet to client12 in 212.5 ms
Florist Fatma has delivered a clove to client16 in 213.2 ms
Florist Fatma has delivered a daffodil to client17 in 205.5 ms
Florist Ayse has delivered a orchid to client14 in 208.3 ms
Florist Murat has delivered a orchid to client15 in 211.5 ms
Florist Fatma has delivered a daffodil to client18 in 203.9 ms
Florist Ayse has delivered a rose to client19 in 206.3 ms
Florist Fatma has delivered a daffodil to client21 in 201.6 ms
Fatma closing shop. 0
Florist Ayse has delivered a rose to client22 in 205.0 ms
Florist Murat has delivered a orchid to client20 in 213.4 ms
Murat closing shop. 0
Florist Ayse has delivered a rose to client23 in 201.7 ms
Florist Ayse has delivered a orchid to client24 in 203.7 ms
Ayse closing shop. 0
All requests processed.
```

```
All requests processed.

Sale statistics for today:
-------------------------------------------------
Florist         # of sales               Total time
-------------------------------------------------
Ayse            10                                2068.7
Fatma           7                                 1453.6
Murat           7                                 1485.4
emire@emire-X555LN:~/Desktop$
```

Valgrind output is below.