

**Due Date: 12.11.2017, 23:55**

## CENG 313 – Operating Systems Homework #1

In this homework you are expected to cover three concepts of OS given below;

- Processes
- Threads
- Inter Process Communications (IPC)

Implement a C program that is explained below using WinAPI. You should implement a program that analyzes market transactions and calculate the summation of how many items (*MILK*, *BISCUIT*, *CHIPS* and *COKE*) are sold in seven days.

First your program should create **seven child processes** that represent a day. Each child process should be responsible of a day. More than one child process should not analyze the same day. Each child's day is decided by parent process.

Then each child process should create **four threads**. Each thread should calculate the summation of an item. More than one thread should not count the same item.

The market transactions and items are stored in a file called **market.txt**. Therefore, the threads should read the **market.txt** file to count the transactions. Each day is separated by start and end annotations such as;

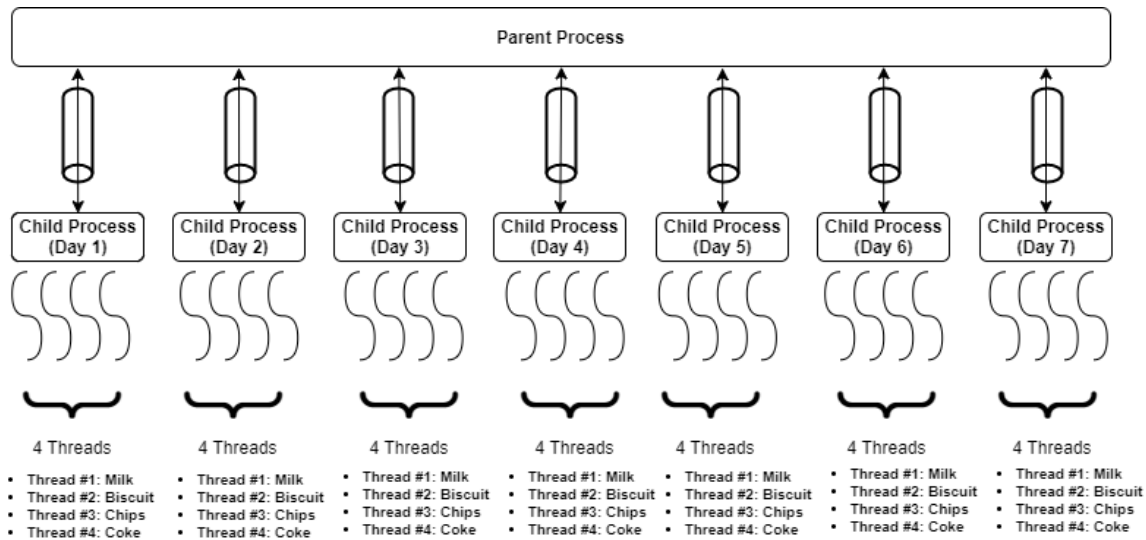
**#START DAY 3#**

...

**#END DAY 3#**

Parent process should assign one day for each child process. This information should be sent via pipe. When threads have completed their tasks, the child process should send the item information (number of *MILK*, *BISCUIT*, *CHIPS* and *COKE* sold in that day). Finally, the parent process will print four information after receiving all the information from the child processes;

- The most sold item in seven days (only for the given four items).
- The most sold item for each day (only for the given four items).
- The total number of each item sold in seven days (only for the given four items).
- The total number of each item sold in each day (only for the given four items).



**HINT: You can use ordinary pipes, but you will need to implement 14 pipes. Or you can use named pipes and you will only need to implement 7 pipes.**

### ASSIGNMENT RULES!

- Cheating will **NOT** be tolerated!
- For any detected cheating will be **graded as 0**.
- Late Submissions will not be allowed.

### GRADE REDUCTIONS

Since you are Junior students you are expected that you are aware of; error handlings, controls, software design etc. This lecture should be taken seriously and will take a crucial part in your work lives. Please code your programs wisely. Possible grade reductions,

- Lack of comment usage!
- Missing controls!
- No error handling!
- Unused/dead codes!
- Naming conventions!

Please do not discuss with us why your grades decreased just because you have done the programming sins listed above!

**NOTE:** Do not ask from us about the possible errors that could occur. From this lecture and labs, you are expected to be aware of the possible errors.