**Home Exercise**

The purpose of the following tasks is to gain familiarity with your way of thinking, your approach to new problems, and your ability to plan and write quality code.

Please invest only as much time as you can and wish to, in order to complete the exercises in the best way possible. Don’t worry about small details you deem irrelevant for the exercise – but note we are willing to see efficient, readable and generally well-designed code.

You can complement your code with comments to help us understand why you chose to implement things the way you did.

Any source of assistance is permitted except for the forward of this document or parts of it to a third party.

You can write your code in the programming language of your choice.

**EXERCISE 1:**

Goal: You need to write a paper explaining your suggestion for the implementation of a code that extracts and saves data from an accessible cloud account (Gmail, Google Drive).

Use any online resource you can for doing the research required to implement such software.

In you research you will have to try and understand how Google behaves.

In your answer, We expect you to consider the following:

* a description of the research steps you took.
* a description of the different security measures you observed.
* a description of the possible ways to bypass or get around those security measures.
* a description of google’s behaviour - how exactly can you get the relevant information? how is the data extracted using automatic methods different than data accessible with a standard interactive method?
* Blockage from the service can be irreversible - you have to stay undetected

Conditions: Assume you have a standard logged on user (use you own google cookie or API token).

**EXERCISE 2:**

Goal:Write a Docker-compose file that creates multiple containers running a web server.

Eachweb server should display a number (from 1 to N where N is the number of total containers) –

This number should represent the chronological order in which this web server went up, relative to the other container web servers.

For example, the first server up would display "1", the second one up would display "2", and so on.

Conditions: all of the web servers (each container) should be accessible on the local network.

You will need to use Docker and Docker-compose for this exercise.

We expect a single portable Docker-compose yaml file that will work on a machine with Docker and Docker-compose. (latest stable versions).

**EXERCISE 3:**

Goal: Your need to implement a cache system for a specific software system.

This software uses a binary file - file.a, as a database.

Reads from this file are too slow - and thus the cache should solve this problem by getting lots of reads to be read from the cache - which is faster.

In order to make the cache as efficient as possible for this specific system, you received a sample file - log.pml, demonstrating an average case of the system’s read pattern ( that is - the usual i/o size, time, and offset that represents how the system usually reads like).

based on this information, implement a cache program that receives a read request (size and offset) - and checks if it has this chunk in the cache - if it does it serves it, if it doesn’t it fetches the chunk from the file and then serves it.

Your goal is to create a cache that will have the most cache “hits” - and thus will be efficient and speed up the system.

Conditions: You will need to work with windows and procmon to view the sample log file of the read pattern.

With this document you should have received the files file.a and log.pml.

Enjoy and Good luck!