BAKI ALİ NEFT MƏKTƏBİ
BAKU HIGHER OIL SCHOOL

Department of Process Automation Engineering
Network Programming
Semester 5 – 2021
Final Exam
Variant 1

Instructor: **Senior lecturer. Suleyman Suleyman**
Examination date**: 25.01.2021**
Examination time**: 2 hours**
Permitted examination support material: **PC (with Linux OS), Vim (NVim),**
Libraries: **Flask, Flask-RESTful, Flask-SQLAlchemy, ZeroMQ, Requests**

Instructions:

- ✓ Write and check all python codes (Input and output formats are important).
- ✓ Points for questions are shown in brackets (total 100 marks).

Task 1: (30 points)

To-do-list app

Create TCP based protocol for exchanging data between server and client using standard python TCP/IP sockets.

The remote app must sort the tasks depending on time of “to-do-list”.

Protocol:

To start the session client must send special message “start_list_session;”.
Then Client must write in console the tasks from “to-do list” in format: “Time - Task;” (with dash and semicolon).
To view all tasks in sorted way by the time from the server, client must send the message “show_list;”
To end the session the client must send the special message “end_list_session;”

Example:

Server

```
$ python to-do-list server
```

Client

```
$python to-do-list client
$start_list_session;
$12:20 - check PC;
$9:00 – breakfast;
$13:00 – Training;
$show_list;
  9:00 – breakfast;
  12:20 – check PC;
  13:00  - Training;
$end_list_session;
```

Task 2: (40 points)

PC_store app
Create RESTful based CRUD app’s API by using *Flask*, *Flask-RESTful*, *Flask-SQLAlchemy*.

The app must store the following data:

1) The data about the PC: It’s CPU, RAM, SSD, PC Price
2) The data about Customer: Name, Surname, email,
3) The data about the deals

The API must be able to add, and delete the new client and PC

The API must be able to write data about the deals between the client and the store.

The API must be able to show all the deals by that has been produced by the client

The API must be able to show all the Clients who bought given PC

The API must be able to show the best buyer of the year (who spends the most money)

Please add the README file and show the routes and GET, POST methods - VERY IMPORTANT!!! The routes depend on you.

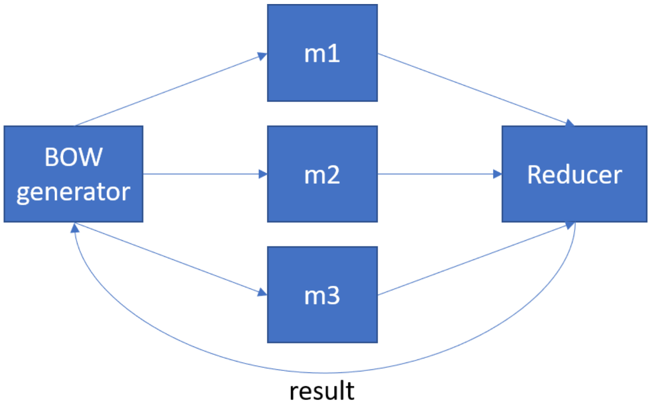
NO need to create the client part.

Task 3: (30 points): Use BagOfWords.txt file

Distributed Bag-of-Words app

Create Message Passing app by using ZeroMQ.

Bag of words represents the dictionary that stores the data in form of *{word: number-of-repeating}*. You must create the distributed system based on map-reduce pattern. The pattern shown below.



The Bag-Of-Words generator separates text (BagOfWords.txt) text file on three equal parts and sends these parts to the mappers m1, m2, m3. The mappers must compute the bag-of-words for given text partition. And send the dictionary to reducer. The reducer combines the results of all the mappers – if mappers contain the same word then the Reducer adds their number of repeating and then sends back the result to BOW generator.