

General Instructions

This is an individual work exam.

Answer all questions

**Deliverables**:

* For each question: create a file:
* Q1 🡪 Q1Lastname.py
* Q2 🡪Q2Lastname.py
* Q3 🡪Q3Lastname.py
* The files should be able to be execute by running them
* When finished: zip all the files in a file named: “**LastName-id-exam.zip**”
* Submit the file in the blackboard: **/assignments-submission/ Midterm**

**Coding:**

You can use python, and related libraries, e.g. Json, csv, Pandas, numpy as you see fit. No other framework may be used.

# Time allocated: 2 hours

The following is a sample of exam from a past semester, it’s indicative only. The exam in the current term may be different.

## Set-up-1: Databases

Go to /Assignments submission/Midterm. You will find supplierProducts.zip’. Download and unzip it in a folder under your home directory named db/. Thus, the path to the unzip files should be: ~/db/university. They contain data and code.

1. Create the database and tables by running the: “createSupplierProductspy”: you will need to set username and password
2. Populate the database by copying and pasting the “populate.py”. Make sure that the directories are right.
3. Inspect the .data file and make sure that all data have been inserted in the tables (you may need to run select \* command

## Q-1: Python: Pandas Data frames 30%

Use Pandas Data frame to read the file “car.data”, and then write code in python for the following questions (Each pandas expression should be preceded by the specification appearing next):

1. print the first and last 5 rows
2. count the number of companies
3. print the rows that contain toyota cars
4. print the number of car/models per company
5. find the most expensive car per company
6. what is the most expensive car? Show the car and the price

## Q-2: Python: Regular expressions 20%

Use regular expressions on the following data to detect patterns:

Data1= "34.54 Hello world, it’s time 01:12:22 41,432,454 to go to 32,345 out 134 23,234,233,430 02:22:13 11,11,11"

Data2= ”Hello this is the end. That is another one”

1. Detect numbers that use *thousands* separators: example: “32,345 23,234,233,430”. However, this is not a number: 11,11,11. Then convert the strings that contain numbers into integers. (Use Data1 as input string).

2. Detect time expressions, time is denoted in the following form: 11:09:14 (hours, min, seconds). (Use Data1 as input string)

3. Detect words; words contain exclusively letter combinations (upper or lower case). (Use Data2 as input string)

4.Detect sentences. Sentences end with a dot. (Use Data2 as input string)

## Q-3: Database: 50%

Write queries on the database you have created. The queries should be in Python:

1. Which are the foreign keys, and that do they mean in the current database?
2. Display the names of the products that are supplied
3. Display the names of products that are supplied in more than 400 units
4. Write a query to count the number of suppliers
5. Display the total number of products
6. Count the total number of suppliers that are offering product P1
7. Write a query to display the names of products that smith is offering.
8. Get all Supplier Name whose name contains the string “Ja”