

**Industrial Programming**

**F21SC**

**Course Work 2**

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## **Introduction:**

Trying new programming language is a good thing to develop and to learn a new programming language. However, Python has many different varieties than any other object-oriented programming language. Switching between Java and C# was much easier this semester for me. As they, both have the same concept of writing and use of semicolon and brackets. The coursework two of industrial programming course was to use python 3 to analyze json data set. Moreover, all the task was declared in the coursework sheet. The task was clear in the coursework sheet with the step to perform the task requirements. On the other hand, the lectures showed us the new techniques in Python that is different than other object-oriented programming languages. Many challenges were in the coursework, though, the significant challenge was to use Python. Furthermore, once getting used to Python I found that it's more pleasant language than others. Other challenges were to use libraries to perform the tasks for graphics output and GUI

## Requirements' checklist

Requirement	Check	Comment
<b>Task 1</b>	<b>Done</b>	All the code was done using Python 3
<b>Task 2 A</b>	<b>Done</b>	The code get all the counties of a given document id and show it in histogram
<b>Task 2 B</b>	<b>Done</b>	The code run task 2a and get the continent of the result of task 2a as per a JSON file that has all the counties information. And it show the result in histogram
<b>Task 3 A</b>	<b>Done</b>	The code get the user browser information for a given document id and show it in histogram
<b>Task 3 B</b>	<b>Done</b>	The result of task 3 a used to get the main user browser name
<b>Task 4 d</b>	<b>Done</b>	A given document id used to get the readers of it and later a dictionary of users and document that been read generated
<b>Task 5</b>	<b>Done</b>	Result of task 4 d used to write a dot file and the code transfer the code to a pdf file and display it
<b>Task 6</b>	<b>Done</b>	A simple GUI class available to be used and to run the required tasks
<b>Task 7</b>	<b>Done</b>	The code can be run form the command line using the same argument in the coursework sheet to perform a particular task

# Design Considerations

## Class design

The code was constructed with the concept of MVC. Once the main code run by the view class in our case called ws2.py an instance of the model class created and connect to the JSON file to get all the required data. The control class link all the other class together. No class can access any other class only thru the control class. Each task has a separate class. However, the control class can pass the data that been got from the model class to each task class to perform the required job to be done. Figure 1 shows the class diagram.

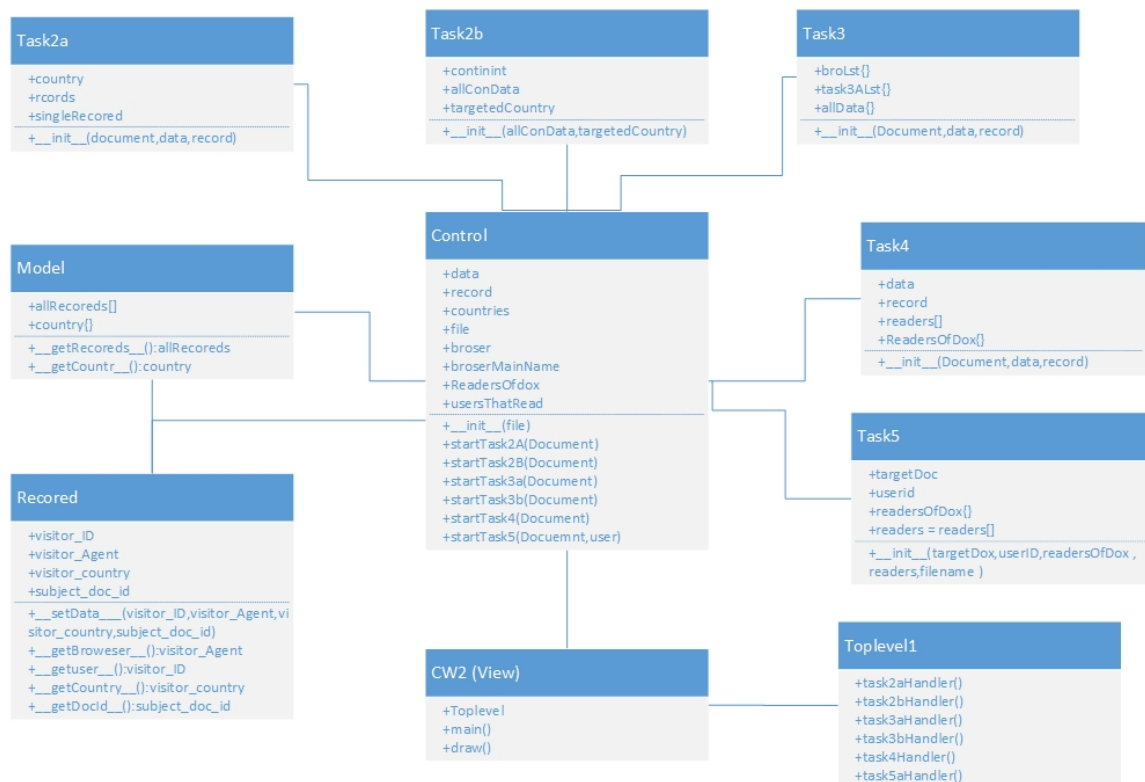


Figure 1

## **Data structures**

Since it is a big dataset a plan came in mind to develop a database schema to get the required task to be done. So that, the code will import the JSON file to the database. That concept was to split the job between the code and the DBMS. However, it will be overload on the processor to load data to DBMS and work on it. Moreover, it will be much easier to store it in an array or dictionary in the heap instead loading it to the database.

Furthermore, a class has been constructed with the field that we need in our tasks. So that, a list of that object will store all records that we need from the JSON file. Many regular checks will be performed on each record to get it and store in the list of used records

The GUI part was used by a simple application called "Page" that develops a drag and drop option and generate a python code

## **User Guide**

The code could be run from the command line or by GUI. The code contains 10 files need to be in the same folder so that it can work. One of that file is the country JSON file so the code can perform the task of getting the continents. To run the code from the command line user can use the same structure in the coursework sheet to perform each task "cw2 -u user\_uuid -d doc\_uuid -t task\_id -f file\_name". Each time the user needs to define a file name, task id, document id and user id. Task id should be 2a, 2b, 3a, 3b, 4d or 5. However, to run the GUI user can run the Python file "cw2.py" and it will give the ability to enter file name and user id and document id. Moreover, various buttons are available to perform each task.

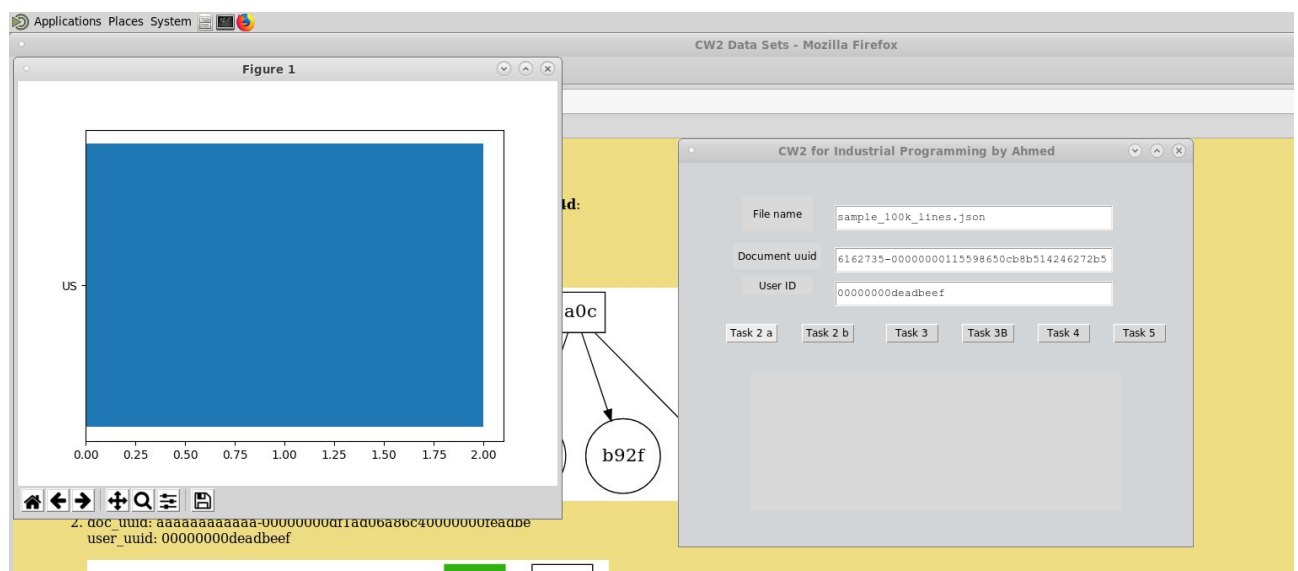
## Developer Guide

The code has 9 classes to work and to deal with specific tasks and specific dataset. Furthermore, it's only getting the data that needed to perform that tasks in the coursework. To develop any new task by a developer new class could be added to perform a different task with the care of the model and record class so that it has the required data to be processed in the new class.

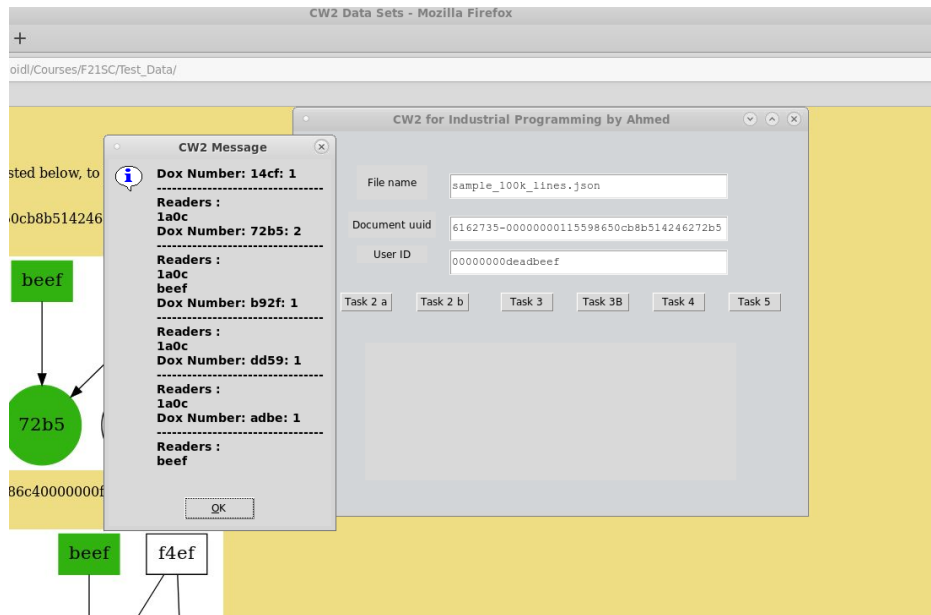
A development of the performance needed in the code. However, to develop the performance a search method in python need to be performed before we load the JSON record. Besides, sorting of outcome data list and dictionary is needed.

## Testing

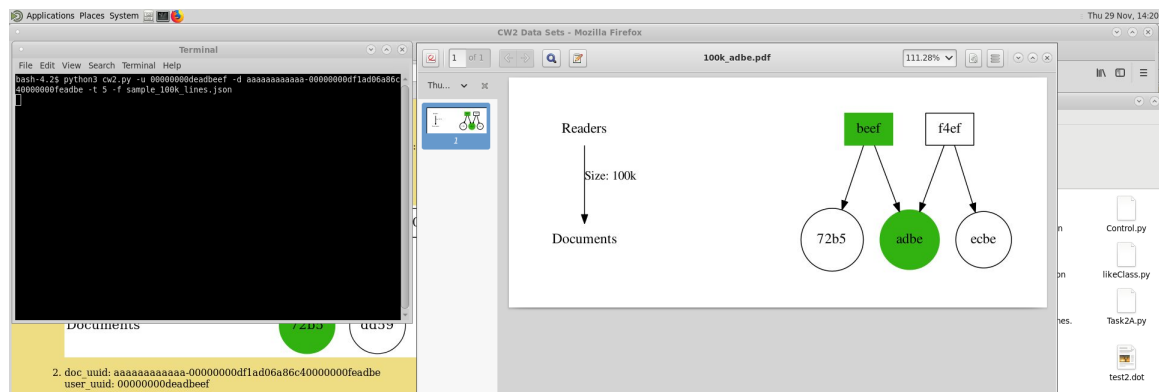
## Loading GUI and Task 2 a



## Task 4 from the GUI part



## Performing task 5 by the command line



## Reflections on programming language and implementation

Coding with python is a pleasant experience that develops my thinking and how the code performs. Python easier than another object-oriented programming language in the part of variables and different type of variable can be combined together with an easy way than another language. On the other hand, when an error occurs it is not easy to

understand the reasons for that error. The GUI part in python was not easy as the editor has no drag and drop options.

### **What did I learn from CW1?**

The first coursework was performed in one way and one side of the code. There was no any use of the object-oriented concept and performance. Structuring the code before starting to code was a missing part in the first coursework. The use of MVC and design pattern wasn't there. However, that affect the code quality and security. Using separate classes make development easy and use of code in other parts of the project helpful. Use of MVC split the code and maintain the security so that only the control will arrange data among all the classes in the code. Moreover, comments are important to keep developing the code

### **Conclusions**

In conclusion, shifting between various programming languages was easy in some cases, however, to Python was not easy to be done. Sure that this language has various features that need to be used in such a task. Many features have been explained in the lectures but unfortunately, i could not have the time to explore and use it. More experience in this Python is a must and pleasant.