DSW03A1 - Development Software

06th March 2023
Course Lecturer: Sandile Thamie Mhlanga

Lab Exercise 2: Big Data and File Manipulation

Instructions

The concepts included have been covered in class under LU 1 Big Data, IoT and 4IR Technologies.

This Lab Ex is a Face-to-Face session. Submission is required. Attendance and Submission counts for marks. TUT submitted remotely without attendance will attract zero marks.

- **IMPORTANT**: Please name your Visual Studio Solution like so (failure to do so will attract a **1%** penalty):
  - [STUDENT_NO]_[SURNAME]_LabEx2
  - (e.g. 222833200_Mhlanga_LabEx2
- **PLAGIARISM**: Please refer to your Learning Guide as well as the latest University of Johannesburg's plagiarism policy document entitled: "POLICY: PLAGIARISM"

COPYING: This is an individual assignment; if any copying is detected, all parties involved will score a **0%** for the assignment and **WILL** face disciplinary consequences

Question 1

Background

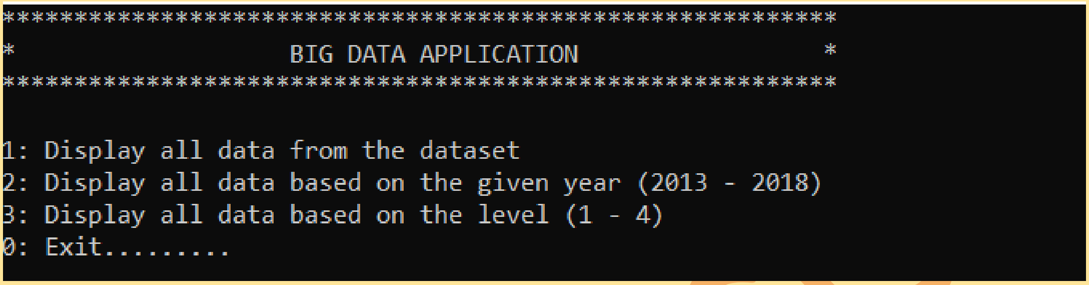
Recall from LU1 that Big Data is often large volume of data – both structured and unstructured; and that it may be analysed computationally to reveal patterns, trends, and assciations; keep this mind as you engage through this exercise.

Search the internet for a dataset of Big Data (you need to be able to explain why you think the dataset you have selected can be classified as Big Data).

Once you find this data set:

- Store this information in a text file
- Create a C# program to read this file in and store the information in a data structure.
- The user must be able to display the data based on two categories e.g. either year and level in the example given below.

The application must provide the user with menu option as shown in **Figure 1**



```
*************************************************************
*                     BIG DATA APPLICATION                  *
*************************************************************


1: Display all data from the dataset
2: Display all data based on the given year (2013 - 2018)
3: Display all data based on the level (1 - 4)
0: Exit.........
```

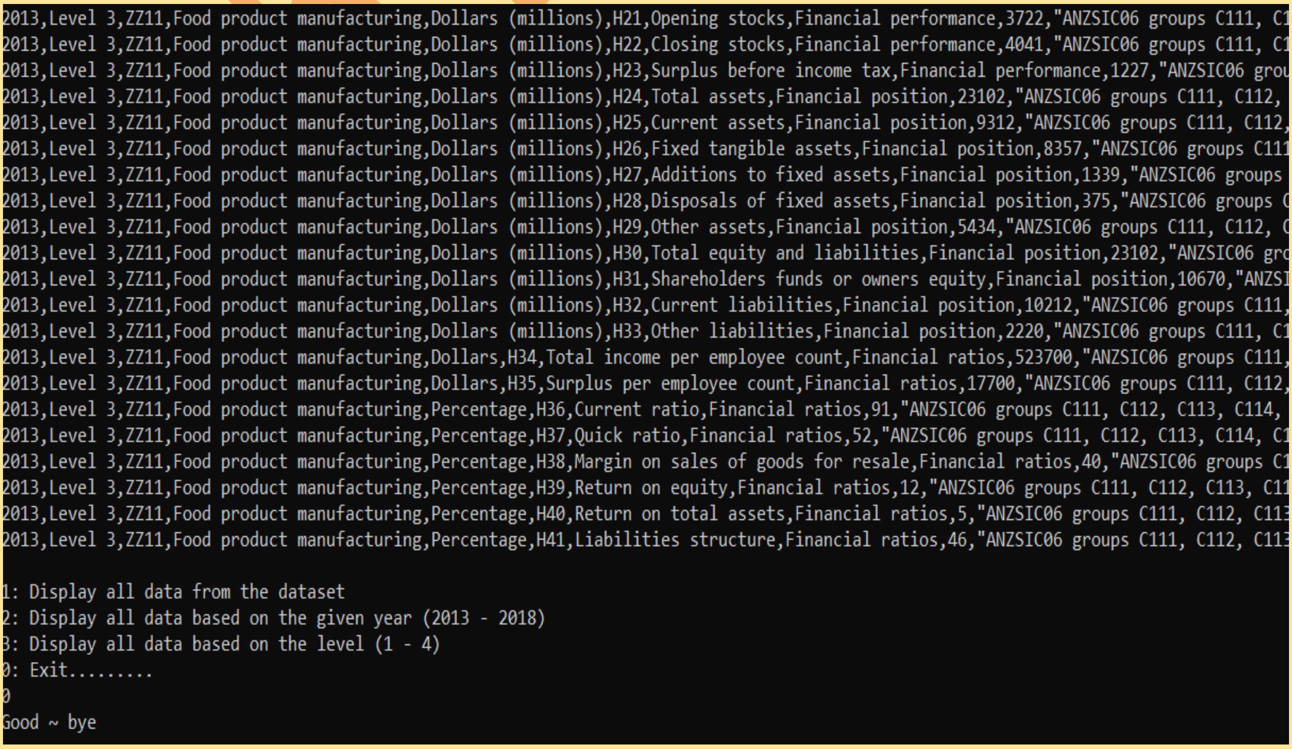
Figure 1

Option 1 must display all the data stored in the file.

Option 2 must display all the data based on the supplied year.

Option 3 must display the data based on another or different criteria. In the given example, it is based on the “Level”

Option 0 must terminate the program



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2013,Level 3,ZZ11,Food product manufacturing,Dollars (millions),H21,Opening stocks,Financial performance,3722,"ANZSIC06 groups C111, C1
2013,Level 3,ZZ11,Food product manufacturing,Dollars (millions),H22,Closing stocks,Financial performance,4041,"ANZSIC06 groups C111, C1
2013,Level 3,ZZ11,Food product manufacturing,Dollars (millions),H23,Surplus before income tax,Financial performance,1227,"ANZSIC06 grou
2013,Level 3,ZZ11,Food product manufacturing,Dollars (millions),H24,Total assets,Financial position,23102,"ANZSIC06 groups C111, C112,
2013,Level 3,ZZ11,Food product manufacturing,Dollars (millions),H25,Current assets,Financial position,9312,"ANZSIC06 groups C111, C112,
2013,Level 3,ZZ11,Food product manufacturing,Dollars (millions),H26,Fixed tangible assets,Financial position,8357,"ANZSIC06 groups C111
2013,Level 3,ZZ11,Food product manufacturing,Dollars (millions),H27,Additions to fixed assets,Financial position,1339,"ANZSIC06 groups
2013,Level 3,ZZ11,Food product manufacturing,Dollars (millions),H28,Disposals of fixed assets,Financial position,375,"ANZSIC06 groups C
2013,Level 3,ZZ11,Food product manufacturing,Dollars (millions),H29,Other assets,Financial position,5434,"ANZSIC06 groups C111, C112, C
2013,Level 3,ZZ11,Food product manufacturing,Dollars (millions),H30,Total equity and liabilities,Financial position,23102,"ANZSIC06 gro
2013,Level 3,ZZ11,Food product manufacturing,Dollars (millions),H31,Shareholders funds or owners equity,Financial position,10670,"ANZSI
2013,Level 3,ZZ11,Food product manufacturing,Dollars (millions),H32,Current liabilities,Financial position,10212,"ANZSIC06 groups C111,
2013,Level 3,ZZ11,Food product manufacturing,Dollars (millions),H33,Other liabilities,Financial position,2220,"ANZSIC06 groups C111, C1
2013,Level 3,ZZ11,Food product manufacturing,Dollars,H34,Total income per employee count,Financial ratios,523700,"ANZSIC06 groups C111,
2013,Level 3,ZZ11,Food product manufacturing,Dollars,H35,Surplus per employee count,Financial ratios,17700,"ANZSIC06 groups C111, C112,
2013,Level 3,ZZ11,Food product manufacturing,Percentage,H36,Current ratio,Financial ratios,91,"ANZSIC06 groups C111, C112, C113, C114,
2013,Level 3,ZZ11,Food product manufacturing,Percentage,H37,Quick ratio,Financial ratios,52,"ANZSIC06 groups C111, C112, C113, C114, C1
2013,Level 3,ZZ11,Food product manufacturing,Percentage,H38,Margin on sales of goods for resale,Financial ratios,40,"ANZSIC06 groups C1
2013,Level 3,ZZ11,Food product manufacturing,Percentage,H39,Return on equity,Financial ratios,12,"ANZSIC06 groups C111, C112, C113, C11
2013,Level 3,ZZ11,Food product manufacturing,Percentage,H40,Return on total assets,Financial ratios,5,"ANZSIC06 groups C111, C112, C113
2013,Level 3,ZZ11,Food product manufacturing,Percentage,H41,Liabilities structure,Financial ratios,46,"ANZSIC06 groups C111, C112, C113

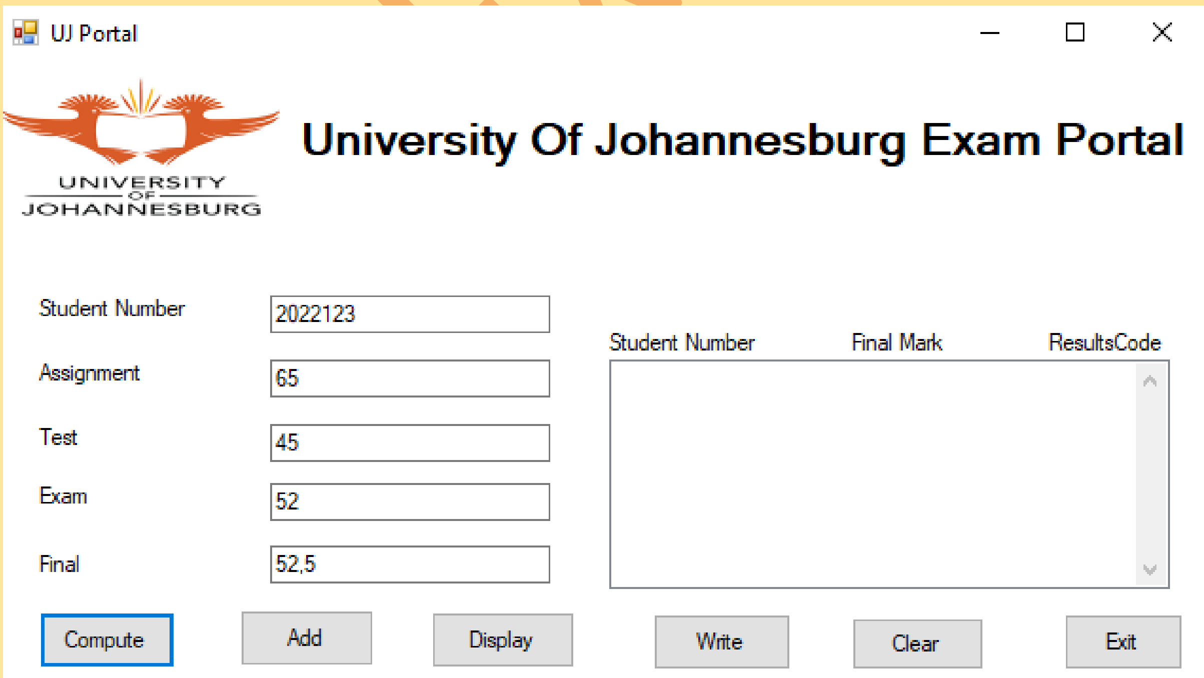
1: Display all data from the dataset
2: Display all data based on the given year (2013 - 2018)
3: Display all data based on the level (1 - 4)
0: Exit.........
0
Good ~ bye
```

Criteria	Weight (%)
Ability to read in the input file and display all data	5
Ability to read in the input file and display data based on the year	6
Display data based on another criteria beside the year	8
Menu created and works correctly	3
User interface: Main	10
Neatness, good programming principles (including variable naming, comments, etc.)	3
TOTAL	35

Question 2

Background (Windows-based application and Arrays of Objects)

You are requested to develop a C# application for out institution. The application determine a student's final mark based on the marks obtained from the assignment, test and examination. The assignment, test, and exam has the weights of 20%, 30% and 50% respectively. The captured user input and the computed final mark is stores in a data structure such as an array of objects. The application must also save all students' data in a "TXT" file called **exam.txt.** The below diagrams illustrates the operations that that must performed



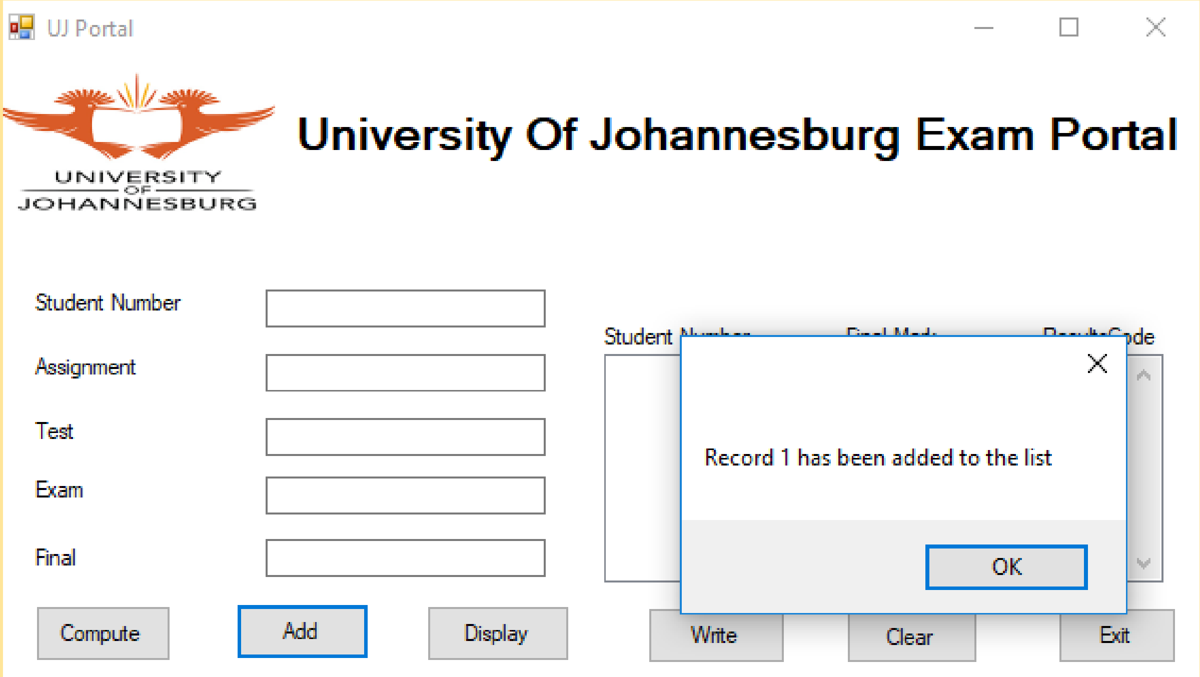
UJ Portal

University Of Johannesburg Exam Portal

Student Number	2022123
Assignment	65
Test	45
Exam	52
Final	52,5

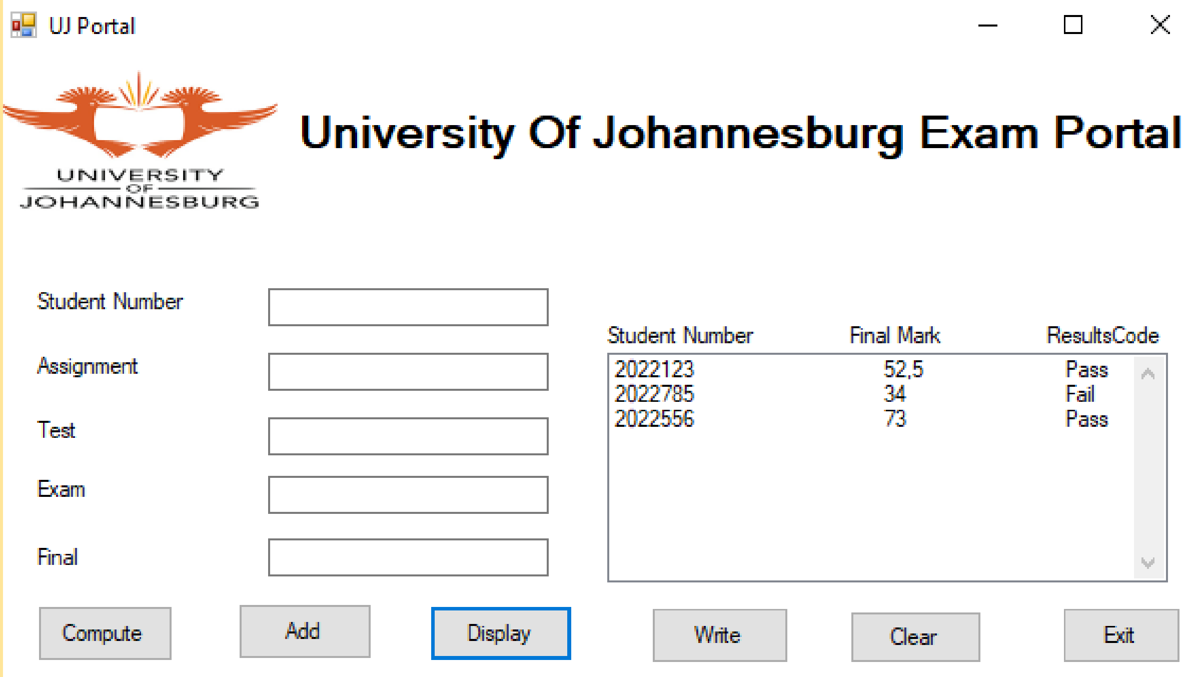
Student Number	Final Mark	ResultsCode

Figure 1



Record 1 has been added to the list

Figure 2



Student Number	Final Mark	ResultsCode
2022123	52,5	Pass
2022785	34	Fail
2022556	73	Pass

Figure 3

Exercise

Based on the given background do the following:

- Create a window form interface with the various GUI controls has shown in **Figure 1**
- Create class' that are need to solve the given problem, you can have more the one class, for example:
  - **Student class**: contains the student attributes such as student number, assignment mark, test mark, etc.
  - **StudentRecord class**: stores student's objects in a data structure.
- The application must also store the data in the data structure into a file.

Rubric

Criteria	Max	Mark
GUI Interface	9	
Ability to create class student	5	
Ability to create StudentRecord Class with a data structure e.g array of objects	5	
Ability for the main to create and invoke various methods	5	
Read to file	6	
TOTAL	30	

NB: This Lab Ex must be submitted by 23:59, Monday 13th of March 2023