Final Assessment – Project Work

Fundamental of Data Science

A Project Report about Student Profiles Management System

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Kathmandu, Nepal

1 July 2024

Table of Content

1. Project Description

This project is designed as the final assessment for the Fundamental of Data Science course. It involves creating a basic student profile management system using Python, featuring a Graphical User Interface (GUI) to enable users to log in and access their respective dashboards. In case of login errors, the program screen will display an error message and prompt for re-login. Admin users can manipulate student data, while student users can view their extracurricular activities and examination grades along with their personal details. This project incorporates the implementation of Object-Oriented Programming (OOP), functions, file handling, modular programming, and exception handling. It aims to challenge and test our creativity, problem-solving abilities, and comprehension of the subject matter.

2. Statement of Project

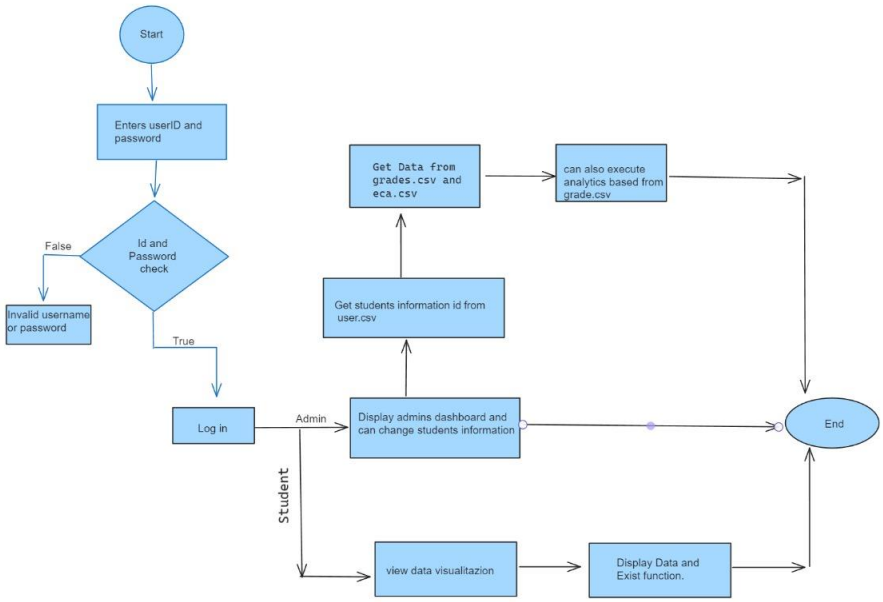
The task involves developing a basic student profile management system that handles student personal details, exam grades, and extracurricular activities over recent years. The system relies on four CSV files:

- 'users.csv' storing registered users' personal information and roles,
- 'grades.csv' stores the marks of registered users for five subjects.
- 'eca.csv' storing registered users' extracurricular activity details during their study period,
- 'passwords.csv' stores the passwords of each user.

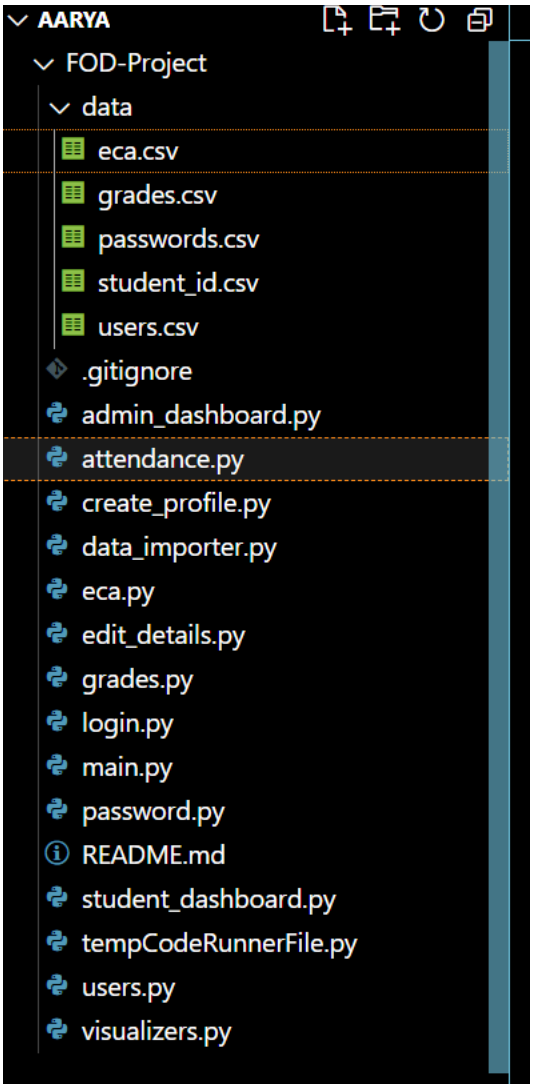
3. Objectives

The goal of this project is to develop a user-friendly and secure login system along with an interactive dashboard tailored for both student and admin users. The system aims to provide seamless access to academic information, enabling efficient viewing and management of data.

4. Flow Chart


Start
Enters userID and password
Id and Password check
False
Invalid username or password
True
Log in
Admin
Display admins dashboard and can change students information
Get students information id from user.csv
Get Data from grades.csv and eca.csv
can also execute analytics based from grade.csv
End
Student
view data visualitazion
Display Data and Exist function.

5. Methodology



eca.csv

FOD-Project > data > eca.csv

```
id,eca
3VH4YC1VM60,Hiking
1EJ6TW8XH25,Football
8P17A18TA80,Hiking
1CV8NC8XM28,Football
8JR5JQ3MH11,Volleyball
6JW2P58QU50,Table Tennis
4RH4G14CJ24,Table Tennis
9KP1E04VV26,Volleyball
9NG7V83VR82,Hiking
5JN1UP8TG01,Volleyball
4QA0WK2CE72,Football
2FV3PA2TR97,Volleyball
1U28F91PV76,Basketball
5K32AX1QW22,Basketball
3ET0Q58DU35,Hiking
9WG9G54QJ41,Volleyball
9CA6TN5AM94,Hiking
3GJ6V80PG91,Hiking
6P82T16HG40,Football
1JV6D99NU85,Hiking
4V15MR8EX17,Football
2M56U62JW68,Football
9XJ7RN7YT81,Table Tennis
3RV5D28PU23,Football
8GH9KQ8FQ41,Volleyball
2QT2NT4MK83,Table Tennis
8CT9H01YP23,Football
5MJ4RC8HX82,Basketball
6WX7V58PR27,Hiking
```

grades.csv

FOD-Project > data > grades.csv

```
id,fod,fom,it,english,maths
3VU9JE9AA49,33,53,38,23,63
5VJ8XW0EN36,35,17,31,43,69
1C43EY6WT47,2,59,32,96,88
5HT1UP2UX94,98,76,92,72,38
5DP7FA9HY43,94,93,60,43,80
5R43MA6UT72,83,3,12,11,64
2AU7G90DY28,32,15,21,18,24
6WU2R67VT38,39,10,40,100,82
1GR5CM4KE76,64,26,48,52,53
1VP5JJ4XU35,52,33,27,31,62
9E15KP5EG05,64,28,72,21,17
2CE4KP1FM26,96,73,94,92,76
1DD4CY2MH44,23,49,57,33,80
1X10AN7VT01,40,29,67,44,1
9P26C75TA22,74,92,21,100,37
1K45WJ1HH69,1,25,99,13,100
6MV3HE0UE77,8,13,8,62,74
9NM2NK7UK44,54,19,83,56,75
5CD7HN7UP17,53,76,18,47,48
6KC5KP1HU27,62,66,64,73,94
7NU3KQ3KY90,76,59,60,4,38
4DC1D16AG22,21,28,76,26,1
4Q48P43XD17,65,73,40,18,66
1T14XM8GK28,38,80,56,85,56
1E33H86HM66,44,77,76,48,43
9EA3T41FK60,57,46,85,15,51
1Y52KG2YY80,22,33,86,76,72
4QG0Q01RU94,9,99,23,73,95
1FK8VC0XM58,28,8,88,36,82
```

passwords.csv

FOD-Project > data > passwords.csv

```
id,password
3VH4YC1VM60,"uD9"">3p/ZNpdg`H"
1HC5U30FG90,"iY6!jJZD?W("""
1EJ6TW8XH25,wK71)fJtWgk\Q'p
2E05G54PY22,"dJ8c?$,C2.*Kb(G`"
4V70AE2YW17,zN8.EjFCo4Wt33KE
5R00HX1FJ42,mZ50J7JYrya=MS
3Y37VQ1MQ93,jM0)w$2SP+*%E
8HQ7HF6YR00,wI21PAOR7q%TO
8P17A18TA80,dJ3%YpkYLwQ+AY/
2UM8CN0PQ66,nO7o<r42
1CV8NC8XM28,sZ1vqIan`
8JR5JQ3MH11,rD4>)F)TG0Iw<#
6JW2P58QU50,pJ3Jn<SR9F
5D03Q83XQ28,eI31\w%UkZY5IQ
5QN8KD1KJ87,"uK3|_'=L,*(>"
4RH4G14CJ24,pK4jFDJR&
9KP1E04VV26,vT1Wz_E1n/RjRs
3YD1Y37GX53,pD2Ni9Vl85|QU
8XK1MA5WY44,gM0>2W\c
7YT1E51QH77,vC59$K|G
9NG7V83VR82,"eZ4ua)f""\4uh"
5JN1UP8TG01,"zK2,kj7Rwzrk!a"
3NT2QG8NY36,bY3Uf?P6rl7BW
4QA0WK2CE72,aO3=/XC'~OVBsAhn
4FE9JK4CA68,qW1?%k@+DN4qV~V
2TN7J22JP96,kH2zTtU5#l0(
5N10XE1XJ33,"hL7'KfV?5,"
8Q33GY9RF89,oT1`!$@%JJ|LS
8DM0T98FW23,wR6b7M_Je
```

FOD-Project > data > student_id.csv

```
id
3VH4YC1VM60
1EJ6TW8XH25
8P17A18TA80
1CV8NC8XM28
8JR5JQ3MH11
6JW2P58QU50
4RH4G14CJ24
9KP1E04VV26
9NG7V83VR82
5JN1UP8TG01
4QA0WK2CE72
2FV3PA2TR97
1U28F91PV76
5K32AX1QW22
3ET0Q58DU35
9WG9G54QJ41
9CA6TN5AM94
3GJ6V80PG91
6P82T16HG40
1JV6D99NU85
4V15MR8EX17
2M56U62JW68
9XJ7RN7YT81
3RV5D28PU23
8GH9KQ8FQ41
2QT2NT4MK83
8CT9H01YP23
5MJ4RC8HX82
6WX7V58PR27
```

FOD-Project > data > users.csv

```
id,first_name,last_name,email,role,city
3VH4YC1VM60,Jeno,Innman,jinnman0@wikimedia.org,Student,Shangshaleng
1HC5U30FG90,Mel,Malcher,mmalcher1@deliciousdays.com,Admin,San Francisco
1EJ6TW8XH25,Oona,Reddin,oreddin2@wired.com,Student,Kabar Utara
2E05G54PY22,Yevette,Cinavas,ycinavas3@ifeng.com,Admin,Orléans
4V70AE2YW17,Constantine,Tetsall,ctetsall4@adobe.com,Teacher,Provatás
5R00HX1FJ42,Kenn,Bartoszek,kbartoszek5@go.com,Teacher,Wanmingang
3Y37VQ1MQ93,Jean,Skechley,jskechley6@webmd.com,Admin,Bagumbayan
8HQ7HF6YR00,Kristan,Birkett,kbirkett7@google.pl,Admin,Pueblo Nuevo
8P17A18TA80,Orelle,Miners,ominers8@independent.co.uk,Student,Bandeirantes
2UM8CN0PQ66,Kamila,Bunt,kbunt9@themeforest.net,Teacher,Banaybanay
1CV8NC8XM28,Arnaldo,Wardlaw,awardlawa@constantcontact.com,Student,Severoural'sk
8JR5JQ3MH11,Madelina,Fazan,mfazanb@wordpress.org,Student,Bicos
6JW2P58QU50,Carola,Kinglake,ckinglakec@utexas.edu,Student,Hoima
5D03Q83XQ28,Andris,Iacobassi,aiacobassid@berkeley.edu,Teacher,Romny
5QN8KD1KJ87,Xavier,Driuzzi,xdriuzzie@ibm.com,Teacher,Pandan
4RH4G14CJ24,Susi,Crawley,scrawleyf@360.cn,Student,Tizguine
9KP1E04VV26,Deedee,Slegg,dsleggg@delicious.com,Student,Alkmaar
3YD1Y37GX53,Hogan,Swanton,hswantonh@skyrock.com,Admin,Jiangcun
8XK1MA5WY44,Cindelyn,Accum,caccumi@bloomberg.com,Admin,Ponta Grossa
7YT1E51QH77,Maurie,Cadagan,mcadaganj@blog.com,Admin,Biaokou
9NG7V83VR82,Cindelyn,Crevagh,ccrevaghk@dot.gov,Student,Killorglin
5JN1UP8TG01,Karlie,Goodread,kgoodreadl@deliciousdays.com,Student,Xiongzhang
3NT2QG8NY36,Elaina,Lipscomb,elipscombm@cmu.edu,Teacher,Ulaan-Uul
4QA0WK2CE72,Odie,Idel,oideln@cdbaby.com,Student,Abonnema
4FE9JK4CA68,Honor,Giff,hgiffo@unblog.fr,Admin,Reriz
2TN7J22JP96,Rudie,Munt,rmuntp@free.fr,Teacher,Caçador
5N10XE1XJ33,Fayth,Langmaid,flangmaidq@tumblr.com,Admin,Nangerang
8Q33GY9RF89,Inness,Lorenz,ilorenzr@jimdo.com,Admin,Dawangzhuang
8DM0T98FW23,Reinhold,Neely,rneelys@cargocollective.com,Teacher,Kitakyūshū
```

6. Work Contribution and Reflection

Aarya Bhandari: Grades.csv / Error Handling

Shrisha Basnet: Passwords.csv / visualization

Smriti Ale: ECA.csv / Documentation

Subash Shah: User.csv / GUI

Aarya Bhandrai:

I can say that the student profile system project has been an interesting one in the way that it developed some of my technical and interpersonal skills. I had the main duty of overseeing the grade.txt file and for which I was responsible for writing as well as updating student's grades for five subjects. This operation helped me develop the ability to capture and input data accurately and keep files to avoid confusion. From this project, I acquired clearer knowledge of Object-Oriented Programming (OOP) ideas. Using classes and inheritance, and designing specific classes helped in making better programs and organize the code easier. Another factor that was emphasized included error handling and input validation, which played their part in building a stable system. The project also showcased how the application of modular programming was relevant.' Division of code into specific modules enabled the development work to be done in an efficient manner and if there was a problem in one part of the code, it was much easier to locate and fix the problem without affecting other parts that were already functioning properly. Not only have I learned several new technical aspects, but I also learned about the importance of clear communication and collaboration to accomplish the project objectives.

Shrisha Basnet:

The coordinated project of student profile system is quite useful thereby make them handy and character building. Among the most essential activities let me mention the following: the OOP principles implementation Overall, let me summarize the performed activities in the project. Creating classes, objects, constructors also the usage of inheritance made me realize how OOP results to the production of clean, efficient, reusability, and extensibility of code thus deepened my knowledge of fundamental concepts in programming. Another relevant area studied during the project was the file operations. Operational and storage of users' information, grades and extracurricular activities using reading and writing of text files offered functionality in persistent storage techniques. There was also a proper setting up of error checks and validations or errors in this project to make it a reliable and easy to use program. Thus, the need to adopt a modular approach when choosing programming was further underscored. Dividing the functions and classes into different files helped to have a neat and manageable code and organization of work and it did not allow interlinking of the modules that two or more people in the team were working on. My exact job was creating identification numbers and passwords for the student profile system. I assigned unique IDs and handled passwords securely for 500 students in Python with pandas. This task was that to correctly match each ID, strategic thinking had to be applied to associate it with the records of students. This group project mostly provided a good example of how cooperation should be made. There was need to have regular contacts and keep everybody on the same page. We were always passing on status'; synchronizing tasks to prevent overlap; and brainstorming to find solutions to issues; this improved my problem-solving skills and lacked strong communication skills. Finally, it can be concluded that this project has been an overall learning process. This has enriched my technical knowledge about the advanced concepts such as OOP, file handling and the concepts of modular programming which can be substantial for me in future aspects of my software development career and other related fields that I may engage myself in.

Smriti Ale:

This project aims at designing a Student Profile System to manage and maintain students' details, their examination results and the details of the students' extra curriculum activities. In this project four text files includes users. txt, grades. txt, eca. txt and passwords. txt have been used to contain relevant data for adding effectiveness and user friendly nature to the system.

User Management:

The users.txt file consists of the personal information of the student or admin. The records are populated with distinct ID, first and last name, age, role and additional information. Admin can update the records of the students or even delete records where necessary since the records maintained are accurate.

Authentication:

The system is initiated with a login procedure where the username and password provided corresponds with the ones in the passwords file. txt file. Though this method is simplified for the project, it again stresses on the need to follow the best practice on password protection.

Examination Records:

The grades.txt file used for the analysis is contained in a txt file which has students' examination marks in different subjects. Every record contains the student's identification number and the set of grades they have received. Admin are able to record, modify or provide for cancellation examination records. Students are able to access examination details and subsequent results.

ECA records:

The ECA details for students are saved in the eca.txt file. Thus, each entry contains a student's id, the name of the activity, date and time. Students can access eca records indicating their participation. The ECA record can

be designed to be alterable and extendable by the administrator, accompanying the total account of the student activity.

Learning Outcomes:

While developing this project, I gained valuable insights into several key programming concepts and practices:

Object-Oriented Programming (OOP):

The classes and object functionality supported me to understand proper implementation of the concepts of encapsulation, inheritance, and polymorphism.

File Handling:

Control of storing and using data in files was important for storing and using user information, grades, and records of ECA's. This added to the principle of data management in software development.

Collaboration and Creativity:

This project enabled me to enhance my teamwork and come up with nice ideas. New functionalities, as well as advanced user interface made the overall system stronger and proved the efficiency of team work and creativity.Overall, the Student Profile System project has covered much of the basic and intermediate field of programming and all the concepts and principles were implemented into the project.

Subash Shah:

I have realized that the student profile system project has been a worthy assignment that I have been privileged to work on. Everything centered on me, and my specific work was to handle the users. Txt file to record and update the student's information accurately. This task was excellent in boosting my data organization and file management skills. The project enhanced a good understanding of OOP and designing a program with an aim of reducing the number of lines of code while making the code easy to understand and modify. We incorporated adequate measures that helped us in minimizing errors and enhancing the system's reliability. In the context of operating with CSV files and Data Frames, the large amount of data was handled efficiently. This helped in the interpretation and organization of this data and the following are visualization techniques that were applied to improve on this aspect. It enlarged our possibility to structure a code into the smaller units that are separate from each other and allowed to work on it in a team and individually. Coordination and cooperation were the key components of the interactions, not aspirations for leadership. The updating, the integration of each person with his tasks, and the problem solving improved our cooperation. In general, this project has enhanced my technical skills and highlighted the value of teamwork and written and verbal interaction; all essential components to consider for future software development projects.

Conclusion

In summary, this project focuses on developing a student profile management system with user authentication. The system customizes features based on the user's role, providing students with a read-only dashboard and granting admins full access to modify, delete grades, ECA details, add new users, and their data. By extracting data from various CSV files, the application facilitates interaction with student information, grades, and extracurricular activities while implementing error handling.