COMP1002 Group 12 Project Report

Workshops Enrollment System Report

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1 Introduction

This report introduces creating part of a workshop enrollment system, which the administrator and students use. This enrollment system has two significant components: the control of the workshop system for the administrator and this system for students to enroll in workshops. In this report, we will mention the problem we meet, the detail of the data abstraction, the data type we use in our project, and the design of the custom functions.

2 The Problems Description

Here are the main problems that we meet in our processes of coding:

2.1 Problems with Data File Write & Read

File creation, writing, storage, reading, modification, and deletion are the core codes of the workshop enrollment system. To facilitate the operation of the project, we used TXT and CSV files for data processing.

2.1.1 Problems with TXT File

For TXT files for data processing, the project uses the registered student ID or administrator's account name to create the file. In the first line of these files, save the password entered during registration, that is, the login section will search for files in the folder according to the entered string. And according to the password entered when logging in and compared with the stored password, so as to realize the login system. However, the end of each line of the TXT file will contain "/n", which is a newline character. Will cause incorrect reading and return an error. In order to solve the problem, the "file.readline().splitlines()" function is used to solve the password problem.

For student files and log files, the seminar registration information is stored in the format of "student-ID"+"/t"+"workshop-ID". For the deletion of workshop information, the specific line of TXT is deleted. For this problem, the solution is to read all the lines of the file and store them in a list. For the content you want to delete, query in the list, except for the content of this line, write the rest to the file.

2.1.2 Problems with CSV File

For this project, we use the CSV data file to store the workshop information by admin, and some parts need use to read this CSV file, like search the workshops, update workshops, and check all the workshops. For this part, we use CSV standard library in python [1].
Example 1: When we storage the workshop information data in the CSV file, we find that if the admin adds the workshops the next time, the field name will be written again in the CSV file, which is a bug in our program. So, we give up storage of the field names in the CSV file, but we decide to print the name and form a sheet in our program, and use a loop to let admin can continuous input workshops information.
Example 2: Before we run the update function part, we entered the data we need to change, but when we run this part at the same time, if we continue to update the information, the CSV writing of the first changed information will return to the original place, only keep the second change.

2.2 Problems with Files change In The Folders

When opening a file in a folder, python will return an error and interrupt if the file is not in the folder. This is not conducive to the user's experience and sense of operation. In addition, when the user writes a new file in the folder, since the file with the same file name will not appear in the computer folder, the existing file's content

will be automatically overwritten when the file is written without telling the user. This may cause problems with the data content and cause errors in the python file. In addition, in order not to cause Bugs of reading redundant files, the project needs to delete duplicate files to ensure that there will be no problems when writing files next time. To achieve this goal, we need to filter the existing files in the folder. For this, we refer to the OS standard library in python [2].

2.3 Problems with Loop Statements

As a workshop registration system, we have a registration and login section to judge the correspondence between users and passwords. When registering in the workshop, it is necessary to prevent users from choosing the same workshop or the administrator to create a workshop with the same ID or name. In order to improve the user experience, the project reads the TXT file and stores the content in a dictionary. On this basis, use format to print a table and output later. But in the python dictionary, the same key can only correspond to one value, which causes the omission of output. In order to achieve these functions and solve bugs, while loop and for loop statements are vital codes in the project. In the same def format, bugs will appear in the CSV file to be read when judging whether the input string is in the read CSV file. In order to achieve an infinite loop and avoid false judgments, we found that creating a new single def as a judgment sentence is the best solution.

3 Data Abstraction

3.1 Key Data Types

3.1.1 String

String uses widely in our programming, and the sequence of things forms a string. In our programming, the most use of the string is that we use the string is like the hint information to let users understand how to use this software to finish this register. For example, the string "student id" is used to inform the users that they need to put in the student number to finish the register.

3.1.2 List

The list is also widely used in this programming. A list consists of elements arranged in a particular order, with no relationship between the components. Different data types can be stored in the list simultaneously, and lists can store different types such as integers, floats, booleans, and characters. Lists are ordered sets, and when accessing a list element, tell python the location or index of the component, point out the name of the list, point out the index of the element, put it in square brackets. In our programming, we usually use "workshop-list1 = []" to create a new list, one of the main reasons is that "workshop-list1 = []" is a list that is mutable. This means that build-in functions and other operations can change lists for the further actions.

3.1.3 Integers

In our coding, the most key numeric type is the integers are used to store data and keep different types of values and we can store these data in the list, like in the workshop sheet, the index must be the integer, and that part of the number will be stored into the data file "workshops.csv", and list to help us to do further work. Also, the integer use in the parts that when the program need to have the judgements, for example, when the user want to quit the part, they can input "1" or "2" which both are integers, and have a judgement.

3.2 Key Variables

In the sign up and login parts, the variable "student-user-ID", "admin-user", "admin-passwd", and "student-passwd" for admin and students to make sure when they finish signing up, the username and password will need to verify, if the input is equal, the system that can be login.
The admin workshop part is divided into storage, update, delete, and retrieval parts. In the storage section, the administrator needs to enter the three variables "workshop-ID", "workshop-name", and "total". And the system will automatically arrange index and remind, remind is equal to the number of totals. Finally, these five variables will be saved in the CSV file named workshop. In the update section, the administrator needs to enter the variable "workshop-ID". Based on this ID in the CSV file, the system returns four choices. The administrator can choose one of four options, that is, to change the "workshop-name", "total", the description of this workshop or exit without changing anything. In the delete section, the administrator needs to enter the variable "workshop-ID". Based on this ID in the CSV file, the system deletes the corresponding workshop, deletes its description, and selects the record of this course. In the retrieval section, the system will first print out all the existing workshops. In addition, the administrator can also enter the variable "workshop-ID". The system searches for the corresponding information based on this ID in the CSV file.

In the students control parts, the variable from storage workshops "workshop-content" will be used here that display to students, and let them select the workshops to enroll. In the change password part, we will be using the variable "password" from the reset password function or the "student-passwd" from the sign up part to replace it.

4 A Python Implementation of the Data Types

The data type is a crucial notion in programming. In computer science and computer programming, a data type, according to Shaffer, describes how the programmer want to use data in the format of various data types [3]. Different data types can perform different assignments. The data types we have used can be divided into five types: text type, numeric type, sequence type, mapping type, and boolean type. This part will introduce the five data types of our project that refer to these categories.

4.1 Text Type

Strings are a Python data type for text data. Numbers and characters can both be included in a string. A string can be composed of a single word, a sentence, or many sentences. In our project, this data type is frequently utilized by us. The example is "str(input("Enter Admin Password: "))" In this code, regardless of whether the user inputs numbers or letters, the final return is always a whole string. This data type can be used to allow the user to enter a text for programming, but it is also used when we want to print texts. The string can use it for reminders or notes. For example,"print("This is the list of workshops:")". When users see this sentence, they will understand that this is the list of workshops.

4.2 Numeric Types

Integers and floats are two numerical data types. There are decimal points in a float number. For instance, 1.0, 5.0, 2021, and 3.14. However, we may use "int()" if we want to utilize an integer. Anyway, There will never be a decimal point in an integer. As a result, if we wanted to save 3.14 as an integer, we'd store it as 3. "Check = int(input('Put 1 for "Yes" ; Put 2 for "No":)" When we compute the average of the scores of workshops that students have provided, we use the formula "avg = total / number" for floats. It appears to be more straightforward and more precise than integers. It, on the other hand, requires more storage space than an integer.

4.3 Sequence Types

List, tuple, and range are some of the most fundamental sequence types in Python. A list may be used to contain a variety of values of various data kinds that can be retrieved just by their indices.
"d2 = l1[i],l2[i]", in this codes, d2 is a tuple(int,str), which is immutable. According to the study performed by Sharma. Tuples, like lists, may store multiple items in a single variable and are defined with parenthesis [4]. Although it can slice it like lists, as well as reassign and remove the entire tuple, it is not feasible to alter or copy it. For the advantage of tuple compared with the list, its have a lower memory capacity. When elements are numerous, it could be observed that tuples are quicker than lists.
Another Sequence Types is range, which is a sequence of numbers. There are two default values, they are starting from 0 and increments by 1. For programmers, they could enter a parameter called 'stop', which means the range number could be stopped before the specified number the programmer have given. In our project, "for i in range(len(workshop-list1)):" is a case of range. We first create a range from 0(default) to the length of the list, and use range to output each item in the sequence.

4.4 Mapping Type

In Python, John notices that there is a mapping type called dictionary. It's adaptable. The keys of the dictionary are picked at random. As values, we may use a number of items like lists, integers, or any other changeable type objects [5]. This is a very commonly used data type, but we only use one mapping type, "d = dict()". We use it since it could return the items using (key, value) pairs format. So that iteration of the dict() could be used by 'for k,v in d.items():' in our codes.

4.5 Boolean Type

According to Gavande, the boolean type in Python is one of the built-in data types that may represent one of two values: True or False. It's most commonly used to indicate the truth values of expressions.[6]. In the codes of our project, we use 'while True:' and 'if line1 == adminpasswd:' to execute many codes with different conditions.

5 A Modular Design of the Program via the Definition and Use of a Few Key Functions

5.1 Main Functions

5.1.1 Log In & Sign Up Functions

In login and sign-up functions, we use two kinds of users here, admin and student. For each type of user, we give the different authorities to them, like when the admin login to the enrollment system, they can view all the information and change the information, but students can only view their chosen workshops and read the announcement that the admin has given. Also, we decide use student ID to be the account name to avoid the duplicate name.

5.1.2 Add & Delete & Update & Search Workshops Functions

Add, delete, update and search for workshops all seminars, which are only open for the administrator. New workshops add into the data file and display to the print sheet, also admin can delete the workshops he add, but the workshops ID will be not change, because that is unique. The workshop update function which is base on the workshop ID to developed, once the workshop ID is written, it cannot be changed by anyone. Therefore, the workshop search function is naturally retrieved by workshop id or workshop name.

5.1.3 Enroll & Cancel the Workshops by Students Functions

The functions about students enrolling and canceling the workshops and workshop enrollment results will be stored in the student and log files, which helps the admin know the course that students choose. Also, when students cancel the workshops, the student file and the log file will both delete the enrollment result.

5.2 Extra Functions

5.2.1 Workshops Description & Announcement for Students Functions

Every workshops we add a function that describe the what is this workshop do and the detail about it, also students can read the workshops description before they enroll workshops. After students enroll the workshops, admin can send the announcement to students, and students can check that, but maximum three announcements.

5.2.2 Change Password Function

Change password function which divided into two parts, one is reset password by admin, if student forget the password, they need to call admin to reset the password to "12345678", but admin do not have the authority to read the students password. After they get into they account, they can change the password by themselves.

5.2.3 Students Rating Feedback System & Students Helping Sessions

When students had the workshops, they could rate the grades to be the feedback, from 1 to 5, and the admin cannot view the rating scores by students, only an average mark can see in the admin system. Also, students can let the admin help them choose workshops if they do not have electronic devices.

Conclusions

In this group project, we learned a lot about Python-related knowledge, the communication skill in our team are fully developed. Everyone in our project has their own part of the responsibility. Through our cooperation and hard work, we finally completed the entire project. Through this study, each member of our group has enriched their professional knowledge in the process and is full of confidence in the project we wrote together.
We also use GitHub which is a Code Version control platform website to control and cooperate to develop our code. The project link show below:
https://github.com/COMP1002-G12/Workshops_Enrollment_System_COMP1002_Project

References

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