

Lab 15
OOP – BSDS – Spring 2022

Task: You have to create a code to generate exam paper, where questions are in the text files. You have to create a proper hierarchy of classes, abstract classes and abstract str function in abstract classes. There are two main categories object and subject questions. The objective questions divided in three sections:

- MCQ
- Fill in the blanks
- Crossmatch

The subjective questions divided into two sections:

- Short Questions
- Long Questions

Each question has description (question statement) and marks (default value is 1). The Question class has one class level variable question number initialized by zero or one and incremented by one for each object. The function details are:

init Functions: has two parameters. First parameter is file and second is marks with default value one. The function stores question number using class level variable. Secondly, read the description from file using second parameter the file and finally, assign marks to data member marks

str Functions: This is abstract function. Return question number, description and marks (see output)

Next, the subjective and objective are child classes of Question. Where both are same except **init** function of **Objective** will call super with marks = 1 and **Subjective** will call super with marks = 2 (marks of short questions). The **str** function will be same for both classes, where str of super will be returned.

Next, we will discuss **MCQ, Fill_In_The_Blanks, and CrossMatch** child class is child of **Objective** class. The details are:

MCQ: (child class of *Objective* class, save in file mcq.py)

Data Members: *choice1, choice2, choice3, choice4*

Member Functions: *init, str*

Function Details:

init: This function has one parameter file. The function will call super with parameter file. Next, this function will read four choice into data member using file parameter.

str: The function call str of super. Next, add four choices in separate lines and finally, add string 'Enter your choice' and return

Fill_In_The_Blanks: (child class of *Objective* class, save in file fill_in_the_blanks.py)

Data Members: No data member required

Member Functions: *init, str*

Function Details:

init: This function has one parameter file. The function will simply call super with parameter file.

str: The function will call str of super. Next, it will add string 'Enter your answer' and return

CrossMatch: (child class of *Objective* class, save in file crossmatch.py)

Data Members: *list1, list2, count*

Member Functions: *init, str*

Function Details:

- init:** This function has two parameter file and count. The function calls super with both parameters, where count considered as marks by super class. Next, the function will run a loop count times and read left and right hand statements from file and append into the list
- str:** The function calls str of super. Next, run loop on lists and display left and right hand statements randomly (try to mismatch the original statements). The function displays both left and right statements on the same line with asterisk in between again see sample output for clarity

Next, we will discuss **ShortQuestions, and LongQuestions** child class of **Subjective** class. The details are:

ShortQuestions: (child class of *Subjective* class, save in file shortquestions.py)

Data Members: *no data members required*

Member Functions: *init, str*

Function Details:

- init:** This function has one parameter file. The function will call super with parameter file.
- str:** The function will call str of super. Next, it will add two dashed lines to write answers and return

LongQuestions: (child class of *Subjective* class, save in file longquestions.py)

Data Members: *no data members required*

Member Functions: *init, str*

Function Details:

- init:** This function has one parameter file. The function will call super with parameter file and 5 marks
- str:** The function will call str of super. Next, it will add five dashed lines to write answers and return

Next, we will have **Exam** class having objects of all the Question concrete classes. The function details are:

- init:** This function has only one parameter title. First, this function initialize data member title. Next, this function initialize empty lists for MCQ, Fill in the blanks, short & long questions. Next, this function takes input for each type of questions with required message (see sample) Next, this function opens relevant files. Run loop, create relevant objects, and add into lists. This is a lengthy method, as it has to create the exam.
- str:** The function will call str of all objects and object lists and generate complete paper to be printed after the user selects each type of questions in init function.

Note: The text files has around 2-6 questions of each type. Open these files and read questions carefully. Use strip function to remove '\n' character at the end of each line read from file.

Finally, write Exam Generator program to create object of exam and print exam object. See the sample run carefully. In first five lines user can select count of each type of questions. If user enter zero for any type of question, that question will not appear in the exam.

Sample Run Including Output:

```
Enter count of MCQ questions (1-6):2
Enter count of fill in the blanks count questions (1-6):3
Enter count of statements in crosshatch question(1-6):3
Enter count of short questions:2
Enter count of long questions:2
```

Exam ABC (22)

*** Section M C Q ***

*** Section 1. Which is the smallest province of Pakistan by Population? (Marks: 1)

- A. Punjab
- B. Sindh
- C. Baluchistan
- D. KPK

Enter Your Choice: ***

*** Section 2. Which is the largest province of Pakistan by Population? (Marks: 1)

- A. Punjab
- B. Sindh
- C. Baluchistan
- D. KPK

Enter Your Choice: ***

*** Fill in the blanks ***

3. _____ are computers that support hundreds or thousands of users simultaneously (Marks: 1)

Write Your Answer:

4. Surgeons are using _____ to guide robots to perform delicate surgery. (Marks: 1)

Write Your Answer:

5. A _____ is approximately a million bytes (Marks: 1)

Write Your Answer:

6. Match left side statements with corresponding right side statements (Marks: 3)

If life were predictable, it would cease * * you are busy making other plans

Life is what happens when * * quit talking and begin doing

The way to get started is to * * to be life, and be without flavor

Enter Your Answers:

*** Section Short Question(s) ***

7. Write 11-20 roman numbers in sequence? (Marks: 2)

8. Write Alphabets in reverse order? (Marks: 2)

*** Section Long Question(s) ***

9. Write a note on continenet Asia? (Marks: 5)

10. Define oxymoron with examples? (Marks: 5)
