Lab 12
OOP – BCS

Note: For both tasks create each class in separate file. Main function for both questions is given and output is provided with each task.

Task 1: To demonstrate inheritance with overriding, create parent class Line and child classes as used in main function given in "Task11_1.cpp". Consider class names, main function and required output to write member functions accordingly:

Output:

```
1.Solid Line
2.Dotted Line
3.Dashed Line
4.Distant Dashed Line
5.Double Dashed Line
Enter Line Type:1
__________
_____________________________________

1.Solid Line
2.Dotted Line
3.Dashed Line
4.Distant Dashed Line
5.Double Dashed Line
Enter Line Type:2
- - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
1.Solid Line
2.Dotted Line
3.Dashed Line
4.Distant Dashed Line
5.Double Dashed Line
Enter Line Type:3
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1.Solid Line
2.Dotted Line
3.Dashed Line
4.Distant Dashed Line
5.Double Dashed Line
Enter Line Type:4
- - - - - - - -
- - - - - - -
1.Solid Line
2.Dotted Line
3.Dashed Line
4.Distant Dashed Line
5.Double Dashed Line
Enter Line Type:5
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```

Task 2: Create Parent class **Question** with two data members char pointer description and integer marks. Write constructor with two parameters, character pointer and integer. First parameter character pointer contains description of question, find length of question, declare dynamic array to data member description and copy description to data member. Store marks to data member marks. Write two virtual functions in class Question:

```
virtual void printQuestion()
```

Here, print question description only, remaining functionality will be added in child classes later.

```
virtual int checkQuestion(char *)
```

Just write return 1, actual function will be written in child classes.

Next create child classes DescriptiveQuesiton, MCQ, FillInTheBlank & TrueFalse.
DescriptiveQuestions has one data member char* to store answer. Write constructor with three parameters char* (Question statement), int (marks), char* (answer). Pass first two parameters to parent class constructor, whereas for third parameter, again first find length of answer then create dynamic memory for data member answer and copy parameter answer to data member answer.

Override member function to print question. Question description is already written in parent class function, so call parent class function first, next add one line of output that is print "**Write your answer:** "

Override member function to check question, this function has one parameter that is user answer store in char*, member wise match user answer with stored answer, count characters until first mismatch found. Calculate student's marks in the descriptive question using formula:

$$\frac{number\ of\ characters\ match * marks}{number\ of\ characters \in stored\ answers}$$

To understand consider example, suppose question has 4 marks and stored answer is "east north south west" and user answer is "east west...". In this case only first word is matching, therefore 1 mark will be awarded.

MCQ has five data members. Four char pointers to store four answer choices and one character variable to store '1', '2', '3' or '4' that is correct choice. Write constructor with seven parameters, two parameters for parent class and five parameters for this class. For each of the parameter of type char*, find length, declare char array and copy parameter string.

Override function to print question, print four answer choices with label "Choice 1", "Choice 2" and so on. Next print message "**Select your choice:** ". Override function to check question, just compare first character of user answer with stored correct answer, if matched return marks, otherwise return 0.

FillInTheBlanks has one data members, that is char* having word or phrase that is correct answer of the question. Write constructor with three parameters, two parameters for parent class and one parameters for this class. Again pass two parameters to parent class constructor, for third parameter first find length, declare array to data member pointer and copy answer.

Override function to print question, again first class parent function than add one output line "**Write word to fill blank:** ". Override check question, character by character match user answer with stored answer, if all characters match return marks, otherwise return 0.

TrueFalse has one data members, that is char type variable to store 'T' or 'F'. Write constructor with three parameters, two parameters for parent class and one parameters for this class.

Override function to print question, again first class parent function than add one output line "**Write T for True or F for False:** ". Override check question, match first character of user answer with stored answer, if match return marks, otherwise return 0.
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Code file with main function is provided. Consider main function and `required output and write code of child classes accordingly:`

Required Output: (Four questions and their answers)

Write four directions in small letter alphabetically with single space?
Write your answer: east north south up
Marks: 3

2+3=?
Choice 1: 2
Choice 2: 3
Choice 3: 4
Choice 4: 5
Select your choice: 4

Marks: 1

The sun ____ in the east!
Write word to fill blank: sets
Marks: 1

The sun sets in the west
Write T for True or F for False: T
Marks: 0

********* END OF LAB (Best of Luck) ********