Variables

1. What will be the output of the following Python code? Explain it.

```
var1, var2, var3 = 5, 3.2, "Hello"
```

2. Change type of the all of below variables to integer, if has error explain that.

```
x = 7
y = “3.14”
z = "Python programming"
flag = True
num = 15.
```

3. Calculate the sum and average of the three variables.

```
num1 = "30"
num2 = "20"
num3 = 10
```

4. Write a Python program to swap the values of two variables. For example, if you have two variables `a` and `b` with values `a = 10` and `b = 20`, after running your program, the value of `a` should be `20` and the value of `b` should be `10`.

5. Write a Python program to calculate the area and perimeter of a rectangle. The program should first ask the user to enter the rectangle's length and width, then compute and display the area and perimeter.

String

1. Create a Python code snippet that uses string formatting to print the following sentence: "My name is John and I am 28 years old." Replace "John" and "28" with variables name and age.

2. Write a Python program to concatenate the following strings and print the result:
   - `str1 = "Python"`
   - `str2 = " is"`
   - `str3 = " awesome"`

3. Using f-strings in Python, write a code that prints the result of 7 multiplied by 8 in the format: "The result of 7 times 8 is 56."

4. Consider the string provided below for all parts of this question:

   ```
   text = "Exploration of Python"
   ```

   Part A: Print the first and the last character of the string `text`.

   Part B: What is the length of the string `text`?

   Part C: Extract and print the substring `"of Py"` from `text`.

   Part D: Find and print the index position of the substring `"Python"` in `text`.

   Part E: Replace the word `"Python"` with `"Data Science"` in the string `text` and print the new string.

   Part F: Write a Python code to split the string `text` into a list of words and print this list.

   Part G: How would you convert the entire string `text` to uppercase?

5. Write a Python program with the sentence "I am learning Python". Ask the user for a word to find in this sentence and a word to replace it with. If the first word is found, show the sentence with the word replaced. If not, print: "Word not found.

Conditions

1. Write a Python program to compare two user-input strings. If they're identical, display "Strings are the same"; if not, display "Strings are different."

2. Write a Python program that prompts the user to enter a number. The program should then check:
    - If the number is a multiple of 3, print "Multiple of 3".
    - If the number is a multiple of 5, print "Multiple of 5".
    - If the number is a multiple of both 3 and 5, print "Multiple of 3 and 5".
    - If it's not a multiple of 3 or 5, print the entered number.

3. Ask the user to input a sentence. Write a Python program to:
    - Print "Sentence contains the word Python" if the word "Python" is in the sentence.
    - Replace "Python" with "programming" in the sentence and print the new sentence if "Python" exists.
    - If "Python" is not in the sentence, print the original sentence in reverse.

4. Write a Python program where the user enters a score between 50 and 100. If the input isn't in this range, display "Invalid score." Otherwise, grade the score as "Grade A" for above 90, "Grade B" for 81-90, and "Try harder next time" for 50-80.

Loop

1. Use a `for` loop and the `range()` function in Python to print all even numbers from 2 to 20, inclusive.

2. Write a Python program with a nested `for` loop to produce the following output:

```
1
22
333
4444
55555
```

3. Write a Python program that uses a for loop and the range() function to print the first 10 square numbers (1, 4, 9, ..., 100). Format of the output should be like it:

```
1 * 1 = 1
2 * 2 = 4
3 * 3 = 9
4 * 4 = 16
5 * 5 = 25
6 * 6 = 36
7 * 7 = 49
8 * 8 = 64
9 * 9 = 81
10 * 10 = 100
```

4. Use a `for` loop to calculate the sum of the series 11+12+13+...+1n11+21+31+...+n1 for a given number `n`.

5. Given a string, write a Python program using a `for` loop to print only vowels from that string.

List

1. Given a list of numbers (which may include duplicates), write a Python program with a `for` loop to print only the unique numbers in the list.

2. Create a Python program to add five different numbers (provided by the user) to a list. Use a `for` loop to iterate over the list and print each number.

3. Write a Python program that takes a list of numbers (e.g., `[1, -2, 3, -4, 5]`) and uses a `for` loop to create a new list containing only the positive numbers from the original list.

4. Write a Python program that asks the user to input 10 integers and appends them to a list. Then, find and print the maximum and minimum numbers in the list without using built-in functions like `max()` or `min()`.

5. Explain how to merge two lists `[1, 2, 3]` and `[4, 5, 6]` into a single list `[1, 2, 3, 4, 5, 6]` using a `for` loop instead of list concatenation methods.

Student Management System

Write a Python program to manage student records in a school. Utilize three separate lists to store student numbers, names, and scores. Implement functionalities for managing these records:

1. **Add a Student:** Request the user to input a student's number, name, and score. If the student number already exists in the list, do not add the student. Instead, show an error message saying "Student number already exists." If the number does not exist, add the student's details to the lists.
2. **Display All Students:** Display a list of all students, showing their numbers, names, and scores.
3. **Remove a Student:** Allow the user to delete a student by their number. If the student exists, remove their details. Otherwise, display a message "Student not found."
4. **Edit a Student's Details:** Enable the user to edit the name and score of a student using their student number. If the student number is not found, display a message "Student not found." If found, allow the user to enter a new name and score.
5. **Search for a Student:** Implement a feature to search for students by name. The program should display all details (number, name, and score) for any matching student records.
6. **Show Class Details:** Show the total number of students, calculate and display the average score for the class, and identify the highest-scoring student, displaying their name and score.

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Good Luck, Dear Students!