**Isaac Computer Science Student Activity Booklet**

Arrays, Strings and Records

**Activity 1: Predict & Run**

**Trinket:** <https://trinket.io/python3/f02e05953e17>

A screenshot of a computer code

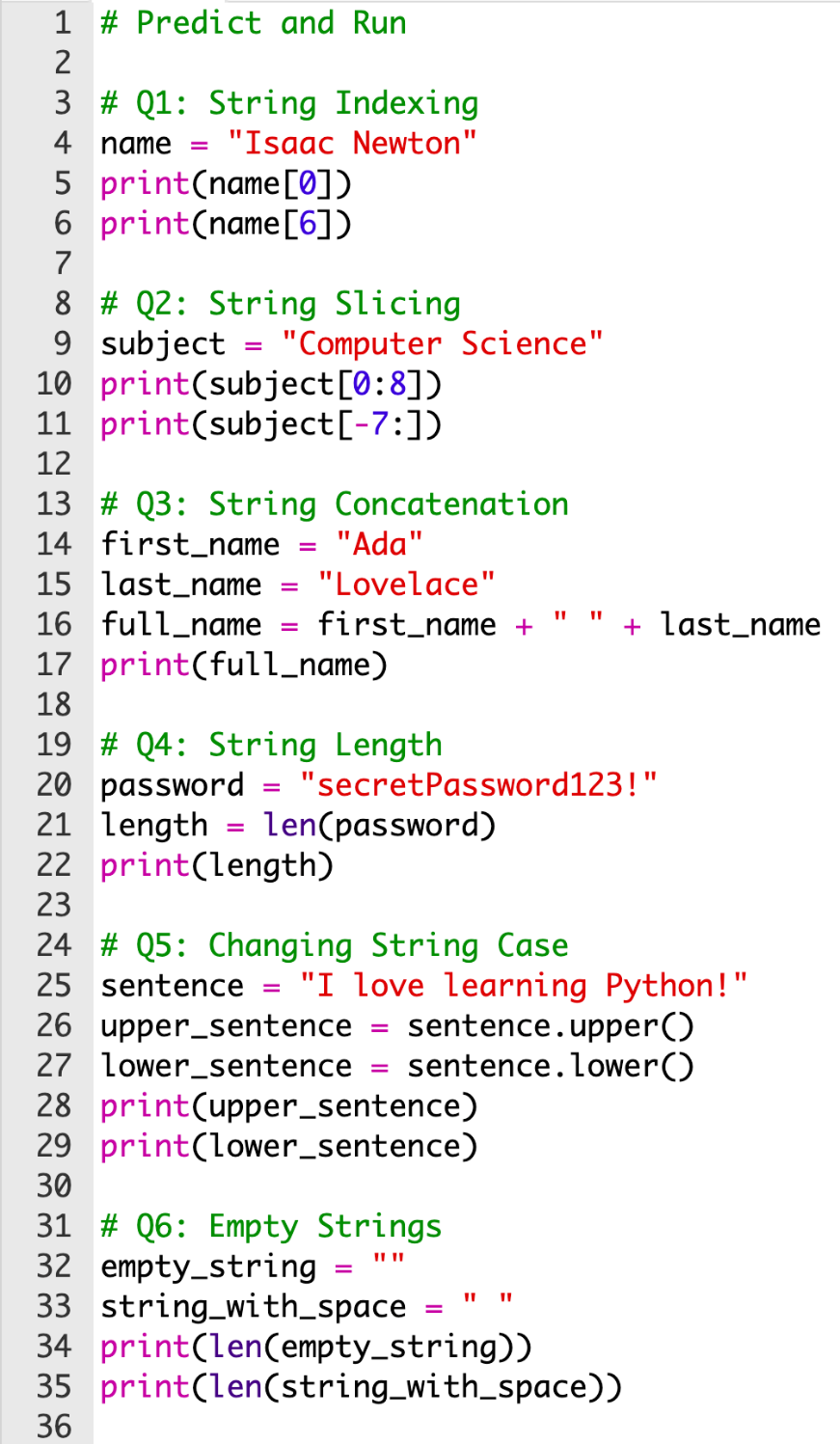
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* Predict the output of each section of the code before running it.

|  |  |  |
| --- | --- | --- |
|  | **Prediction** | **Actual Outcome** |
| Q1 | The first slice student[1:] will print ['Johnson', 18], and the second slice (student[:2]) will print ['Emma', 'Johnson']. | ['Johnson', 18] and ['Emma', 'Johnson'] |
| Q2 | Attempting to modify names[3] = "Radia" will raise an IndexError because there is no fourth element in the names list. The try block will catch this error, and the except block will print the error message. | list assignment index out of range |
| Q3 | The for loop will iterate over the names list, printing Hello, Thiago, Hello, Fatima, Hello, James. | Hello, Thiago  Hello, Fatima  Hello, James |
| Q4 | After appending "Ruchi" and "Rana" to the list, the updated list will be ['Thiago', 'Fatima', 'James', 'Ruchi', 'Rana']. | ['Thiago', 'Fatima', 'James', 'Ruchi', 'Rana'] |
| Q5 | Adding extra\_names = ['Marissa', 'Fei-Fei'] to names using += will result in the list: ['Thiago', 'Fatima', 'James', 'Ruchi', 'Rana', 'Marissa', 'Fei-Fei']. The length of this combined list will be 7. | ['Thiago', 'Fatima', 'James', 'Ruchi', 'Rana', 'Marissa', 'Fei-Fei']  7 |

**Activity 2: Predict & Run**

**Trinket:** <https://trinket.io/python3/b4416f80606f>

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* Predict the output of each section of the code before running it.

|  |  |  |
| --- | --- | --- |
|  | **Prediction** | **Actual Outcome** |
| **Q1** | First character of "Isaac Newton" is 'I', 7th character is 'N' | I  N |
| **Q2** | Slicing "Computer Science" [0:8] gives "Computer", [-7:] gives "Science" | Computer  Science |
| **Q3** | Concatenating first and last name will output "Ada Lovelace" | Ada Lovelace |
| **Q4** | Length of "secretPassword123!" is 18 characters | 18 |
| **Q5** | Uppercase: "I LOVE LEARNING PYTHON!"  Lowercase:"i love learning python!" | I LOVE LEARNING PYTHON! i love learning python! |
| **Q6** | Length of empty string is 0, length of string with space is 1 | 0 and 1 |

**Activity 3: Strings vs Lists**

1. Given a string and a list in Pythonwhich of the following statements is true?

my\_string = "hello"

my\_list = ['h', 'e', 'l', 'l', 'o’]

1. You can change an element of both the string and the list.
2. You can add an element to both the string and the list using the append() method.
3. You can access the first element of both the string and the list using my\_string[0] and my\_list[0] respectively.
4. You can concatenate a list to a string, but not a string to a list

**Answer:** C

**Explanation:**

* Option A is incorrect because while you can change an element in the list   
  e.g., my\_list[0] = ‘y’, you cannot change an element of the string because strings are immutable.
* Option B is incorrect because you can use append() to add an element to the list, but not to the string, as strings do not support the append() method due to their immutability.
* Option C is **correct** because both strings and lists support indexing.
* Option D is incorrect because you can concatenate a string to a list, but not a list to a string.

**Activity 4: 2d Lists**

**Trinket:** [**https://trinket.io/library/trinkets/1767f106b808**](https://trinket.io/library/trinkets/1767f106b808)

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* The grades two-dimensional list represents students' grades in three different subjects.
* The 2nd student’s 2nd grade can be retrieved with the expression grades[1][1]

1. Access the first grade of the first student and the last grade of the last student using indexing. Verify that your indices are correct by printing these grades.

2. Write a script that calculates the average grade for each student and prints it. Use a loop to iterate through each student's grades e.g.

for student\_grades in grades:

average = sum(student\_grades)//len(student\_grades)

print("Average grade", average)

Solution:

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