Introduction to Python

ITI AI-Pro
Lab 1
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Quick Recap

- Types of Errors
- Print statements
- Variables and Data types
- Data structures

Python Errors

1. Syntax Error

```
print(Hi)
```

```
print("I am mostafa")
```

```
print(3 * 6)
```

```
print"Wonderful " day)
```

```
print("Wonderful " day")
```

1. Runtime Error

```
0 / 0
```

1. Logical Error

Type Error

```
a = "Hi"

b = 3.14

a + b
```

Indexing Error

List = [1,2,3]

print (List[3])

Key Error

```
D1={'1':"aa", '2':"bb", '3':"cc"}
```

```
D1['4']
```

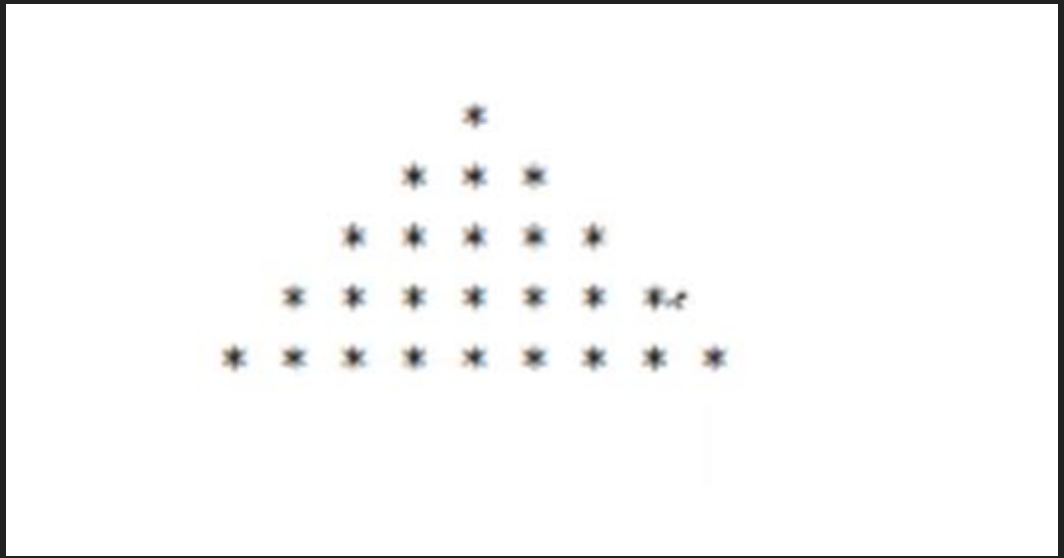
Print Exercises

Guess the output

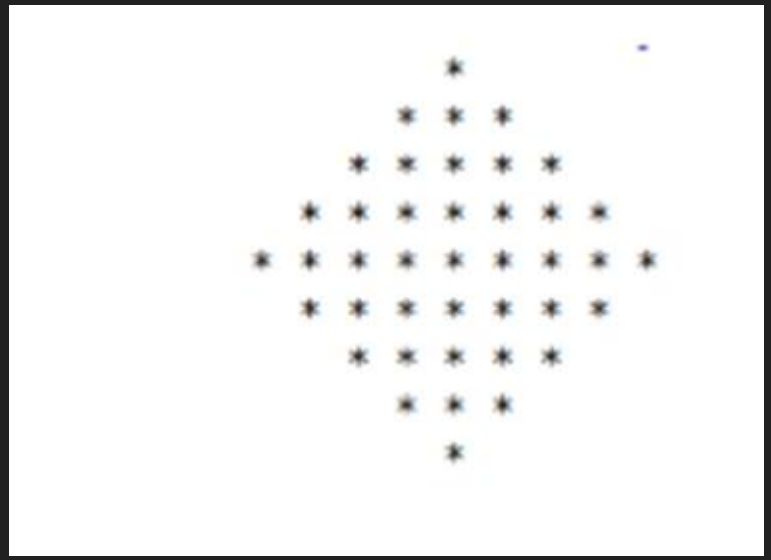
```
1  print('Practice', " Makes Perfect.")
2  print("Children must be taught\n  how to think\n  NOT\n  what to think")
3  print("\"\"")
4  print('2 * 3 * 4 * 5 / 10 = ')
5  print(2 * 3 * 4 * 5 / 10)
6
```

Write a code the prints

Write a code that prints -optional



Write a code that prints -optional



Variables and Datatypes

Write a program that takes 2 numbers from the user and prints their summation, difference, multiplication, and division. Your output should look like shown:

```
Enter first number: 6
Enter second number: 4
6.0 + 4.0 = 10.0
6.0 - 4.0 = 2.0
6.0 * 4.0 = 24.0
6.0 / 4.0 = 1.5

End of program
```

- Write a program that reads 2 integers num1 and num2
- E.g. say we read num1 = 7 and num2 = 25
- Target: we want swap the values of num1 and num2?
- Swap means exchange
- So Num1 has value 25 and Num2 has value 7
- Write 3 lines of code only

Hint : use map(int,input.split()) to take user input

Write a program that performs the following function:(optional)

- Given 8 space-separated integers, find the sum of those in **even** places and the sum of those in **odd** places.
    - Note: Even place means the 2nd, 4th, 6th or 8th numbers, odd places are the 1st, 3rd, 5th and 7th numbers.
  - Note: the 8 numbers will be on the same line
  - Note: Don't print any welcome or by messages.
- **Input**: 11 2 7 9 12 -8 3 -1
- **Output**: 2 33
- Example Explanation:
  - 2 + 9 + (-8) + (-1) = 2 for the even places
  - 11 + 7 + 12 + 3 = 33 for the odd places

Write a program that performs the following function:(optional)

- Write a program that read 3 strings.
  - For simplicity let's say input is 3 letters A, B and C
- The output is A'B"C repeated 10 times
  - **A'B"C**A'B"C**A'B"C**A'B"C**A'B"C**A'B"C**A'B"C**A'B"C**A'B"C**A'B"C**A'B"C
- Input:
  - I
  - am
  - Mostafa
- Output:
  - I'am"Mostafal'am"Mostafal'am"Mostafal'am"Mostafal'am"Mostafal'am"Mostafal'am"Mostafal'a m"Mostafal'am"Mostafal'am"Mostafa

Write a program that reads integer N and Print the sum from 1 to N (without loop) (optional)

E.g. If input N = 5, then Output is: 15

Why? As 1+2+3+4+5 = 15

Below table of more values

3 ⇒ 6 (1+2+3)

4 ⇒ 10 (1+2+3+4)

5 ⇒ 15 (1+2+3+4+5)

You need to find a simple 1 line formula to solve the problem :)

Hint: Let N = 8. Write numbers from 1 to 8

•What is the sum of 1st and 8th number? sum of 2nd and 7th? And so on

Your formula should be good for even and odd N. Be careful programmer

Data Structure

LIST	TUPLE	DICTIONARY	SET
Allows duplicate members	Allows duplicate members	No duplicate members	No duplicate members
Changeble	Not changeable	Changeable, indexed	Cannot be changed, but can be added, non -indexed
Ordered	Ordered	Unordered	Unordered
Square bracket [ ]	Round brackets ( )	Curly brackets{ }	Curly brackets{ }

Exercises

Remove the duplicates from a list without using a loop:

For example: List= [1,2,3,3,4]

Output: [1,2,3,4]

Given two lists create a third list by picking an odd-index element from the first list and even index elements from the second.

Given: no branching needed

listOne = [3, 6, 9, 12, 15, 18, 21]

listTwo = [4, 8, 12, 16, 20, 24, 28]

Expected Output:

Element at odd-index positions from list one

[6, 12, 18]

Element at even-index positions from list two

[4, 12, 20, 28]

Printing Final third list

[6, 12, 18, 4, 12, 20, 28]

Given a two list of equal size create a Python set such that it shows the element from both lists in the pair

Expected Output:

```
First List  [2, 3, 4, 5, 6, 7, 8]

Second List  [4, 9, 16, 25, 36, 49, 64]

Result is  {(6, 36), (8, 64), (4, 16), (5, 25), (3, 9), (7, 49), (2, 4)}
```

Exercise 1: Reverse a given list in Python

- aLsit = [100, 200, 300, 400, 500]

- **Expected output:**
- [500, 400, 300, 200, 100]

Exercise 2: Add item 7000 after 6000 in the following Python List

- list1 = [10, 20, [300, 400, [5000, 6000], 500], 30, 40]

- **Expected output:**
- [10, 20, [300, 400, [5000, 6000, 7000], 500], 30, 40]

Exercise 3: Given a nested list extend it by adding the sub list ["h", "i", "j"] in such a way that it will look like the following list

- list1 = ["a", "b", ["c", ["d", "e", ["f", "g"], "k"], "l"], "m", "n"]

- **Sub List to be added** = ["h", "i", "j"]
- **Expected output:**
- ['a', 'b', ['c', ['d', 'e', ['f', 'g', **'h', 'i', 'j'**], 'k'], 'l'], 'm', 'n']

Exercise 4: Given a Python list, find value 20 in the list, and if it is present, replace it with 200. Only update the first occurrence of a value

- list1 = [5, 10, 15, 20, 25, 50, 20]

- **Expected output:**
- list1 = [5, 10, 15, 200, 25, 50, 20]

Exercise 5: Remove empty strings from the list of strings

- list1 = ["Mike", "", "Emma", "Kelly", "", "Brad"]

- **Expected output:**
- ["Mike", "Emma", "Kelly", "Brad"]

Exercise 4: Given a Python list, find value 20 in the list, and if it is present, replace it with 200. Only update the first occurrence of a value

- list1 = [5, 10, 15, 20, 25, 50, 20]

- **Expected output:**
- list1 = [5, 10, 15, 200, 25, 50, 20]

Exercise 5: Remove empty strings from the list of strings

- list1 = ["Mike", "", "Emma", "Kelly", "", "Brad"]

- **Expected output:**
- ["Mike", "Emma", "Kelly", "Brad"]