



National University

of computer and emerging sciences

LAB: Artificial Intelligence

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Python Lab : Python Basics to Advance

Instructions

1. Make a word document paste your code and output there.
2. Comments in the code explaining chunks of the code is important.
3. Plagiarism is strictly prohibited, 0 marks would be given to students who cheat.
4. Late submissions are not allowed.

Task 1

Write a python code to print the following sequence of string.

“My name is ABC,

My roll number is 18F-XXXX,

I Like AI Subject :D ”

Note: Name and roll number should be yours.

Task 2

Write a python code to do the following task

- i. Take 2 integers from user input
- ii. Make the following functions of Add, Subtract, Multiply and Divide Remainder, Square, and Cube of a given number.
- iii. Display the output of each function.

Note: Square and Cube functions can take 1 value.

Task 3

Write a python code to do the following task

- i. Take 3 float values from user input
- ii. Make a function that adds 5 to first value 10 to second value and 15 to third value
- iii. Return these 3 values and show it in the main function.

Task 4

Write a python code to do the following task

- i. Take 2 strings with sequence = “HELLO, WORLD” and “HOW, arE yOu”.
- ii. Do the following tasks Concatenate the 2 strings, Make the 2 strings in upper and lowercase, Slice the strings using python string slicing. The following string should look like this after slicing; “,World” and “EyO”.
- iii. For the second string you have to use only negative number for slicing.

Note: Read the instructions carefully. And the output of string should be exact especially in slicing.

Task 5

Take a start value and end value from user and print Even and Odd numbers between them using **for** and **while** loop.

Task 6

Get number from the user and find the sum of natural numbers till that number.

Task 7

Get number from the user and write a program to reverse the number.

Task 8

Use slicing and string concatenation. Str = "Master has failed more, than the beginner has tried"

Task 9

```
list = ["apple", "cherry", "orange", "kiwi", "melon", "mango"]
```

- i. Remove “cherry” and “melon” from list.
- ii. Add “banana” at second last index.

Task 10

```
list = [ 1, 4, 56, 2, 4 , 12, 6, 89 ,11, 0]
```

Write a program to empty list using **while loop** and **pop()** function.

Task 11

```
marks = {'AI':74,'CN':76,'DS':42,'PS':54}
```

- i. Print the sum of marks using **for loop**.
- ii. Print keys and values both using **for loop**.
- iii. Print max marks and relative subject name.
- iv. Print mix marks and relative subject name.

Task 12

Write a python code to find if the number is an Armstrong number or not!

Note: $abcd = a^n + b^n + c^n + d^n + \dots$, n is the total number of digits.

Task 13

Write a python code to find the factorial of number using recursion.

Task 14

Write a python code to make a list. Populate it with random number using random number generator and then find the min and max value from the list. Size of list should be given by user.

Note: do not use max and min built-in function.

Task 15

Write a python code to create a tuple. And do the following tasks.

- i. Create Tuple = ("john", "mark", 12, "14", "orange", 4.5)
- ii. Then update the Tuple and add a new value 6.5.
- iii. After updating the value, create a function that shows the count of how many integers, strings and float variables does it have.

Task 16

Write a python code to create a dictionary. And do the following tasks.

- i. Create Dictionary = {"brand": "Samsung", "OS-type": "Oreo", "color": "black", "camera": "42 megapixels", "year": 2012}
- ii. Then add a list in the current dictionary with key = "sizes" and values of random numbers.
- iii. Then delete the "year" key from the dictionary.
- iv. Lastly show the dictionary in following order. Use loop to show the dictionary:
 - a. Brand
 - b. Color
 - c. Camera
 - d. OS-type
 - e. Sizes

Task 17

Create a function that takes list list1 and list2 as parameter, create a list list3 inside the function and store the sum of list list1, list2 into list3 then return list3.

```
list1 = [11,22,33,44,21,54,67,54,33,222,4]
```

```
list2 = [3,4,5,32,21,33,66,75,87,97,1]
```

Task 18

Create a function dsort() to sort a list in descending order, taking a list as argument and returning it. Use the following list and print it.

```
list = [ 5, 6, 7, 23 ,12 ,3, 3, 4 ,5, 12, 34]
```

Task 19

Implement Stack and Queue in Python

Write separate functions for inserting and deleting and ask the user to input the values.

Task 20

Write a python program to create a class. And do the following tasks

- i Create a class named Student with following attributes. First-name, Last-name, Age, CNIC, Courses (list), Gender, CGPA, SGPA, Current_Credit_Hours.
- ii Create a constructor for making new instances of the class.
- iii Getter, Setter method should be included as well
- iv Also add CRUD operation methods in the class.

Create at least 3 objects to show the working of the class.

Task 21

From Task 20 you have to create lists of objects, dictionary of objects and tuples of objects.

Compare these objects if they are equal or not. Also print each objects values from different data-structures.

Task 22

Write a python program to create a class. And do the following tasks

- i Make a class named Shape, Rectangle and Circle.
- ii In the class Shape there is a print function that tells which object is calling it and prints the class name.
- iii Also make 2 functions of area and perimeter in Rectangle and Circle class.
- iv Display the name of both classes using the print function in class Shape and also the calculations of each function of their respective classes.

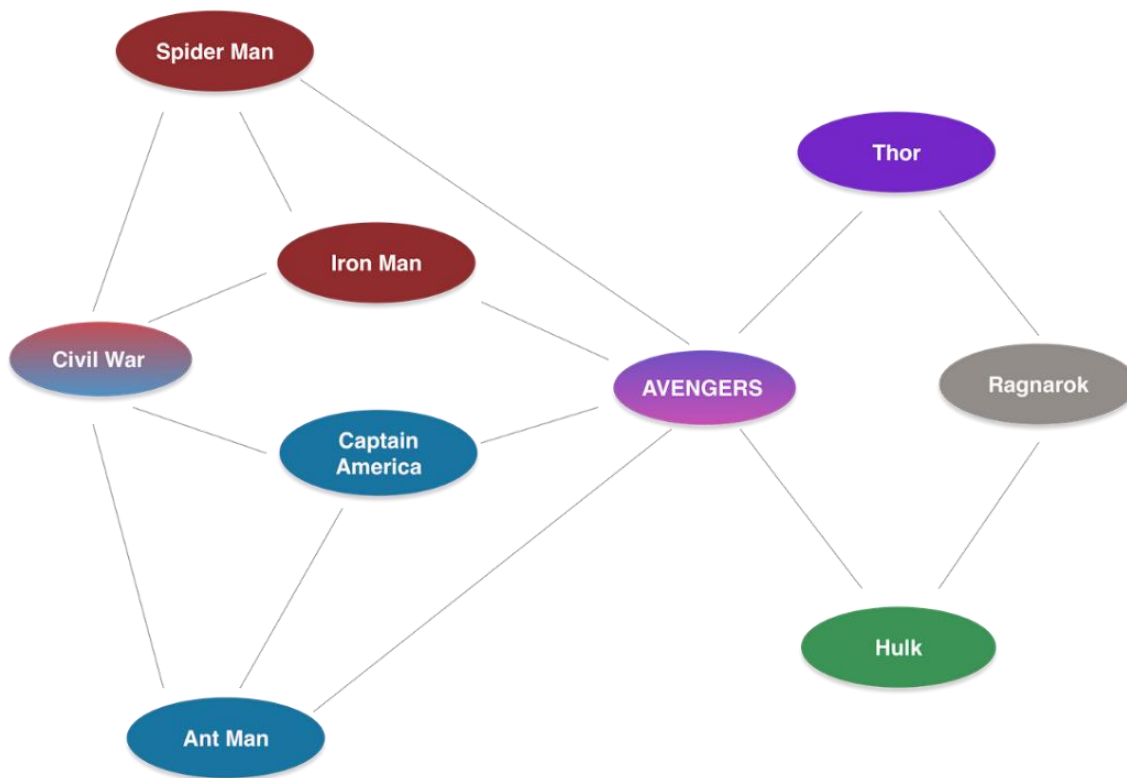
Note: You cannot use Shape object.

Hint: Inheritance!

Task 23

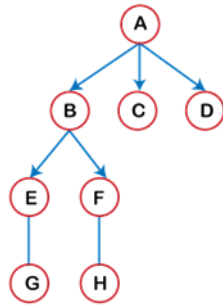
Plot the given graph

Note: Use matplotlib or any other python library for plotting graph.



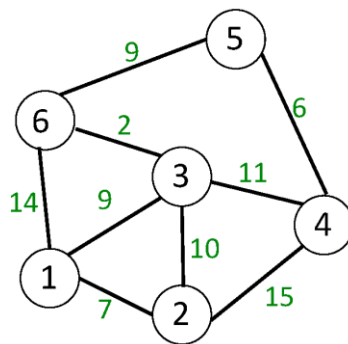
Task 24

Implement given graph using adjacency list



Task 25

Implement the given graph using adjacency matrix



Pycharm

Note: For this part, provide only screenshots.

Task 26

Write some basic shortcuts of pycharm (minimum 5) relating to code indentation, changing theme, etc. (no screenshots needed)

Task 27

How to install library from terminal

How to install library without using terminal

Task 28

How to zoom in pycharm

Task 30

How to change theme in Pycharm