Object-oriented programming (OOP)
(Python I)
Lab3

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Python Functions

A function is a block of code which only runs when it is called.
You can pass data, known as parameters, into a function.
A function can return data as a result.

Function Syntax

```
def function_name(parameters):
        statement 1……
        statement 2……
        ……
 function_name()
```

Ex

❑calculate triangle area

```
def area():
    b=eval(input("Enter triangle base "))
    h=eval(input("Enter triangle high "))
    print((b*h)/2)
area()
```

Output

```
Enter triangle base 8
Enter triangle high 4
16.0
```

Example

- Write a Python function named **reverse_string** that takes a string as input and returns the string reversed.

```
def reverse_string(str):
    result=""
    index=len(str)
    while index>0:
       result+=str[index-1]
       index-=1
    return(result)
print(reverse_string("python"))   # nohtyp
```

Example

- Write a Python program that prompts the user to enter two integer values. Use a function named **prompt** to get each integer value from the user. The program should then add these two integers and display the result in the format "value1 + value2 = sum".

```
def prompt():
    value=int(input("please enter an integer value  "))
    return value
print("this program adds together two integers")
value1=prompt()
value2=prompt()
sum= value1+value2
print(f"{value1} + {value2} = {sum}")
'''
```

Output

```
this program adds together two integers
please enter an integer value  100
please enter an integer value  5
100 + 5 = 105
'''
```

Python Conditional Statements

1. 'if ' Statements

Conditional (if) is used to test a condition, if the condition is true the statements inside if will be executed.

Syntax:

```
if (condition 1):
        statement 1
        statement 2
```

write a python program that find biggest of two numbers ……

```
X = float(input('Enter your 1st number: '))
    #  X=99
Y= float(input('Enter your 2nd number: '))
     #  Y=35
if x > y:
   print( "X is greater than Y")
print('End')
```

```
X = float(input('Enter your 1st number: '))
     #  X=99
  Y= float(input('Enter your 2nd number: '))
      #  Y=35
  if x > y:
     print( "X is greater than Y")
     print('End')
```

2. ' if - else ' Statements (without use function)

- Write a Python Program to find area of a square perimeter when length positive :

```
Length = float (input( 'Enter Length of square': ))
if (Length >0):
    print('square area=' ,Length*Length)
    print('perimeter area=',4*Length)
```

2. ' if - else ' Statements (with use function)

- Write a Python Program to find area of a square perimeter when length positive by using function :

```
def square(l):
    if (l > 0):
        print('square area=' , l * l)
        print('perimeter area=', 4 * l)

length = float(input('Enter Length of square  '))
square(length)
```

2. ' if - else ' Statements (without use function)

- Write a python program to check number is even or odd.

```
num =int(input( 'Enter number  ' ))
if(num%2==0):
    print(f"{num} is Even" )
else:
     print(f"{num} is Odd" )
```

2. ' if - else ' Statements (with use function)

- Write a python program to check number is even or odd.

```
def check_odd_even(num):
    if num % 2 == 0:
        print(f"{num} is even")
    else:
        print(f"{num} is odd")
check_odd_even(4)
check_odd_even(int(input("Enter the number you want to verify"   )))
```

2. ' if - else ' Statements (without use function) …

- Write a python program to find user is eligible to vote or not And how many years can wait? ?

```
age=int(input("enter the age   "))
if (age>=18):
    print('Eligible to vote' )
else:
    temp=18-age
    print(f"Not eligible to vote and wait for {temp} year")
```

2. ' if - else ' Statements (with use function) …

- Write a python program to find user is eligible to vote or not And how many years can wait? ?

```
def vote(x):
    if (age>=18):
        print('Eligible to vote' )
    else:
        temp=18-age
        print(f" Not eligible to vote and wait for {temp} year")
age=int(input("enter your age   "))
vote(age)
```

3. ' If - elif - else ' Statements

- The elif is short for else if.
- This is used to check more than one condition.
- If the condition1 is False, it checks the condition2 of the elif block. If all the conditions are False, then the else part is executed.
- Among the several if...elif...else part, only one part is executed according to the condition

3. ' If - elif - else ' Statements (without use function)

- Write a Python program that simulates a traffic light system where the user can enter the color of the traffic light (red, yellow, green), and the program prints the appropriate action (stop, get ready, go).

```
color = input("Enter traffic light color (red, yellow, green): ").lower()
if color == "red":
    print(" Stop")
elif color == "yellow":
    print(" Get Ready")
elif color == "green":
    print(" Go")
else:
    print("Invalid color. Please enter red, yellow, or green.")
```

3. ' If - elif - else ' Statements (with use function)

- Write a Python program that simulates a traffic light system where the user can enter the color of the traffic light (red, yellow, green), and the program prints the appropriate action (stop, get ready, go).

```
def traffic_light():
    while True:
        color = input("Enter traffic light color (red, yellow, green): ").lower()
        if color == "red":
            print("Stop")
        elif color == "yellow":
            print("Get Ready")
        elif color == "green":
            print("Go")
        else:
            print("Invalid color. Please enter red, yellow, or green.")

traffic_light()
```

3. ' If - elif - else ' Statements (without use function) …

- write a Python program that takes an integer input representing a student's mark and returns the corresponding grade based on the following scale:
  - A for marks 90 and above
  - B for marks between 80 and 89
  - C for marks between 70 and 79
  - D for marks between 60 and 69
  - F for marks below 60

```
mark = int(input("Enter the mark: "))

if mark >= 90:
    grade = "A"
elif mark >= 80:
    grade = "B"
elif mark >= 70:
    grade = "C"
elif mark >= 60:
    grade = "D"
else:
    grade = "F"

print("Grade:", grade)
```

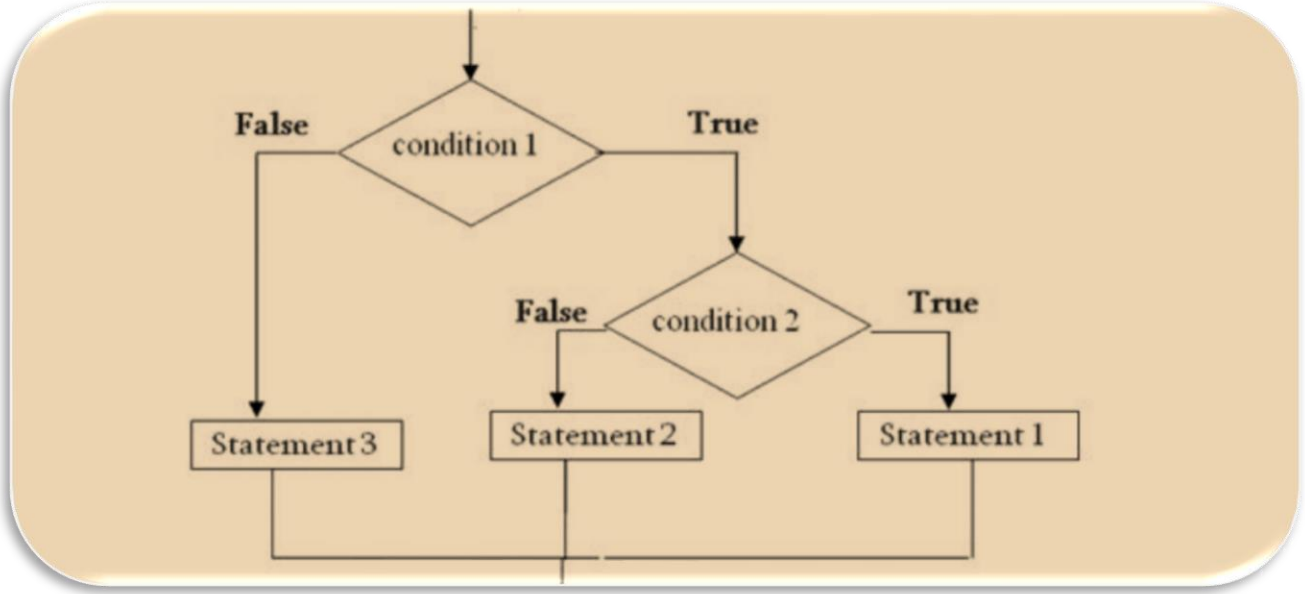
3. ' If - elif - else ' Statements (with use function) …

- write a Python function named (get_grade) that takes an integer input representing a student's mark and returns the corresponding grade based on the following scale:
  - A for marks 90 and above
  - B for marks between 80 and 89
  - C for marks between 70 and 79
  - D for marks between 60 and 69
  - F for marks below 60

```
def get_grade(mark):
    if mark >= 90:
        return "A"
    elif mark >= 80:
        return "B"
    elif mark >= 70:
        return "C"
    elif mark >= 60:
        return "D"
    else:
        return "F"
mark = int(input("Enter the mark: "))
grade = get_grade(mark)
print("Grade:", grade)
```

Nested Conditionals

- One conditional can also be nested within another. Any number of condition canbe nested inside one another. In this, if the condition is true it checks another if condition1. If both the conditions are truestatement1 get executed otherwise statement2 get execute. if the condition is false statement3 gets executed



4. Nested 'if – else' statements (without use function)…

- Write program to check (Positive, Negative, or Zero) numbers

```
n = eval(input("Enter the value of n:"))

if n == 0:
    print("The number is zero")
else:
    if n > 0:
        print("The number is positive")
    else:
        print("The number is negative")
```

4. Nested 'if – else' statements (with use function)…

- write a Python program that allows the user to specify how many numbers they wish to input. The program should then repeatedly prompt the user to enter a number and determine if each number is positive, negative, or zero.

```
def check_numbers():
    x = int(input("How many numbers do you want to enter? "))
    for i in range(x):
        n = int(input("Enter a number to check: "))
        if n == 0:
            print("The number is zero")
        else:
            if n > 0:
                print("The number is positive")
            else:
                print("The number is negative")

check_numbers()
```

'''

Output

```
How many numbers do you want to enter? 3
Enter a number to check: -1
The number is negative
Enter a number to check: 0
The number is zero
Enter a number to check: 55
The number is positive
```

'''

4. Nested 'if – else' statements (without use function)…

- Write program to find greatest of three numbers

```
a = eval(input("Enter the value of a: "))
b = eval(input("Enter the value of b: "))
c = eval(input("Enter the value of c: "))

if a > b:
    if a > c:
        print("The greatest number is", a)
    else:
        print("The greatest number is", c)
else:
    if b > c:
        print("The greatest number is", b)
    else:
        print("The greatest number is", c)
```

4. Nested 'if – else' statements (with use function)…

- Write program to find greatest of three numbers

```
a = int(input("Enter the value of a: "))
b = int(input("Enter the value of b: "))
c = int(input("Enter the value of c: "))
def greater_num(x,y,z):
    if a > b:
        if a > c:
            print("The greatest number is", a)
        else:
            print("The greatest number is", c)
    else:
        if b > c:
            print("The greatest number is", b)
        else:
            print("The greatest number is", c)
greater_num(a,b,c)
```

Thank you