ML ASSIGNMENT

BY-

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CSE-1

Github link for code :

Question 1: Create a program that asks the user to enter their name and their age. Print out a message addressed to them that tells them the year that they will turn 100 years old.

Extras:

1. Add on to the previous program by asking the user for another number and printing out that many copies of the previous message.

2. Print out that many copies of the previous message on separate lines. (Hint: the string "\n is the same as pressing the ENTER button)

Pseudocode

- Take number and age as input
- Take a variable of current year
- Add value of current year with difference of 100 and current age

Program and Output Screenshot

```
In [6]:  1  import datetime
         2  def printName():
         3      name = input("Enter Your Name\t")
         4      age = int(input("Enter You Age\t"))
         5      age_100 = (datetime.datetime.now().year)+(100-age)
         6      print("Hello "+name+ ", you know you will celebrate your centennial in "+str(age_100)+"\n")
         7
         8      number = int(input("Enter the Number of times you want to print this message \t"))
         9      for i in range(number):
        10          print("\nHello "+name+ ", you know you will celebrate your centennial in "+ str(age_100))
        11
        12  printName()
```

```
Enter Your Name Harsimar
Enter You Age   21
Hello Harsimar, you know you will celebrate your centennial in 2100

Enter the Number of times you want to print this message     4

Hello Harsimar, you know you will celebrate your centennial in 2100

Hello Harsimar, you know you will celebrate your centennial in 2100

Hello Harsimar, you know you will celebrate your centennial in 2100

Hello Harsimar, you know you will celebrate your centennial in 2100
```

Question 2 : Take a list, say for example this one:

a = [1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89] and write a program that prints out all the elements of the list that are less than 5.

Extras:

1. Instead of printing the elements one by one, make a new list that has all the elements less than 5 from this list in it and print out this new list.

2. Write this in one line of Python.

3. Ask the user for a number and return a list that contains only elements from the original list a that are smaller than that number given by the user.

Pseudocode

- Normal Code
    - Run a for loop
    - Compare each element with 5
    - If less than 5, print
    - Else iterate to next element
- Creating a new list
    - In an empty list run for loop on original list
    - If element is less than 5, add it to list
    - Else iterate to next element

Program and Output Screenshot

```
In [17]:    1  def printelements(lst):
            2      new_lst = []
            3      for i in lst:
            4          if i<5:
            5              print(i)
            6              new_lst.append(i)
            7      print("New List is {}".format(new_lst))
            8
            9      new_lst2 = [x for x in lst if x<5]
           10      print("New List in one line is{}".format(new_lst2))
           11
           12      number = int(input("Enter the number to find element smaller than the number "))
           13      new_lst3 = [x for x in lst if x<number]
           14      print("Elements smaller than {} are {}".format(number, new_lst3))
           15
           16  a = [1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89]
           17  printelements(a)
```

```
1
1
2
3
New List is [1, 1, 2, 3]
New List in one line is[1, 1, 2, 3]
Enter the number to find element smaller than the number 3
Elements smaller than 3 are [1, 1, 2]
```

Question 3: Write a program that asks the user how many Fibonacci numbers to generate and then generates them. Take this opportunity to think about how you can use functions. Make sure to ask the user to enter the number of numbers in the sequence to generate.(Hint: The Fibonacci seqence is a sequence of numbers where the next number in the sequence is the sum of the previous two numbers in the sequence. The sequence looks like this: 1, 1, 2, 3, 5, 8, 13, ...)

Pseudocode

- Take number as input
- Initialize two variables for first and second term
- Print Second term
- Run a for loop from 1 to number
- Take sum of first and second number
- Set first number = second
- Set second number = sum
- Print sum

Program and Output Screenshot

```
In [19]:   1  def fib(n):
           2     if n <= 1:
           3        return n
           4     else:
           5        return(fib(n-1) + fib(n-2))
           6
           7  nterms = int(input("Enter the number of terms to be printed"))
           8  print("Fibonacci sequence:")
           9  for i in range(nterms):
          10    print(fib(i))

Enter the number of terms to be printed5
Fibonacci sequence:
0
1
1
2
3
```

Question 4 : Write a program (function!) that takes a list and returns a new list that contains all the elements of the first list minus all the duplicates.

Extras:

● Write two different functions to do this - one using a loop and constructing a list, and another using sets.

Pseudocode

- Using Loops
  - Create a new list
  - Run a for loop for all elements
  - Add element to new list if it isn't present
  - Else don't add element and iterate to next

- Using sets
  - Typecast the list to set

Program and Output Screenshot

```
In [20]:    1  def lst_unique(lst):
            2    unique = []
            3    for l in lst:
            4      if l not in unique:
            5        unique.append(l)
            6    for x in unique:
            7      print(x)
            8
            9  def using_set(lst):
           10    list_set = set(lst)
           11    unique_list = list(list_set)
           12    for x in unique_list:
           13      print(x)
           14
           15  a = [1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 21, 89]
           16  print("Without using Sets")
           17  lst_unique(a)
           18
           19  print("\nUsing Sets")
           20  using_set(a)
```

```
Without using Sets
1
2
3
5
8
13
21
34
55
89

Using Sets
1
2
3
34
5
8
13
21
55
89
```

Question 5 : Ask the user for a number and determine whether the number is prime or not. (For those who have forgotten, a prime number is a number that has no divisors.). Use functions

Pseudocode

- Input a number
- Set flag = 1
- Run a loop from 2 to square root of number
- If number is divisible in loop, set flag = 0 and exit the loop
- Else continue
- If flag is 1, number is prime
- Else number is not prime

Program and Output Screenshot

```python
In [21]:  1  def isPrime():
          2      num = int(input("Enter Number you want to check \t"))
          3      flag = 1
          4      for i in range(2, int(num/2)):
          5          if(num%i == 0):
          6              flag = 0
          7              break
          8      if(flag==0):
          9          print("Number is not Prime")
         10      else:
         11          print("Number is Prime")
         12
         13  isPrime()
```

```
Enter Number you want to check  11
Number is Prime
```