# ***Python Introduction Lab***

(Assignment-1)

Submitted By: Amanpreet Singh Saimbhi

Enrollment No.: 00313202717

Class: CSE-01 [8th Sem]

## **Github Link:** https://github.com/Aman-saimbhi/ML_Lab

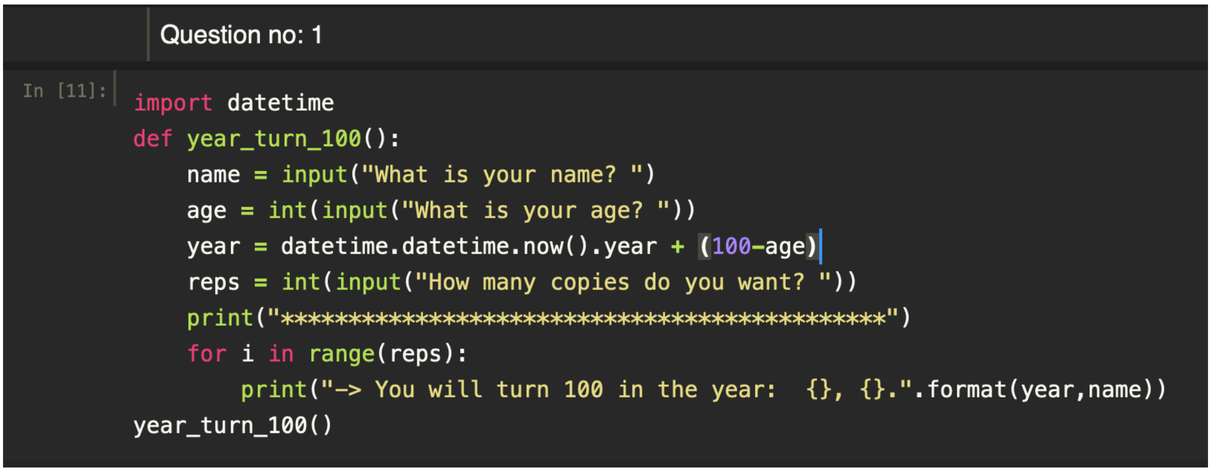
**Q1.** Create a program that asks the user to enter their name and their age. Print out a message addressed to them that tells them the year that they will turn 100 years old.
Extras:

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:**

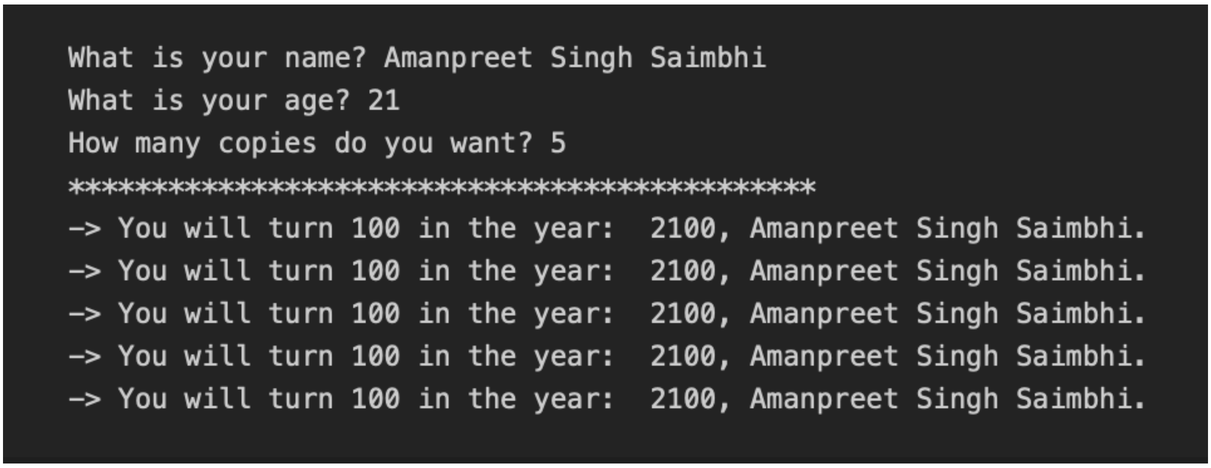
```
import datetime
def year_turn_100():
    name = input("What is your name? ")
    age = int(input("What is your age? "))
    year = datetime.datetime.now().year + (100-age)
    reps = int(input("How many copies do you want? "))
    print("*********************************************")
    for i in range(reps):
        print("-> You will turn 100 in the year:  {}, {}.".format(year,name))
year_turn_100()
```

**Program Screenshot and Output:**



Question no: 1

```
In [11]: import datetime
         def year_turn_100():
             name = input("What is your name? ")
             age = int(input("What is your age? "))
             year = datetime.datetime.now().year + (100-age)
             reps = int(input("How many copies do you want? "))
             print("*********************************************")
             for i in range(reps):
                 print("-> You will turn 100 in the year:  {}, {}.".format(year,name))
         year_turn_100()
```

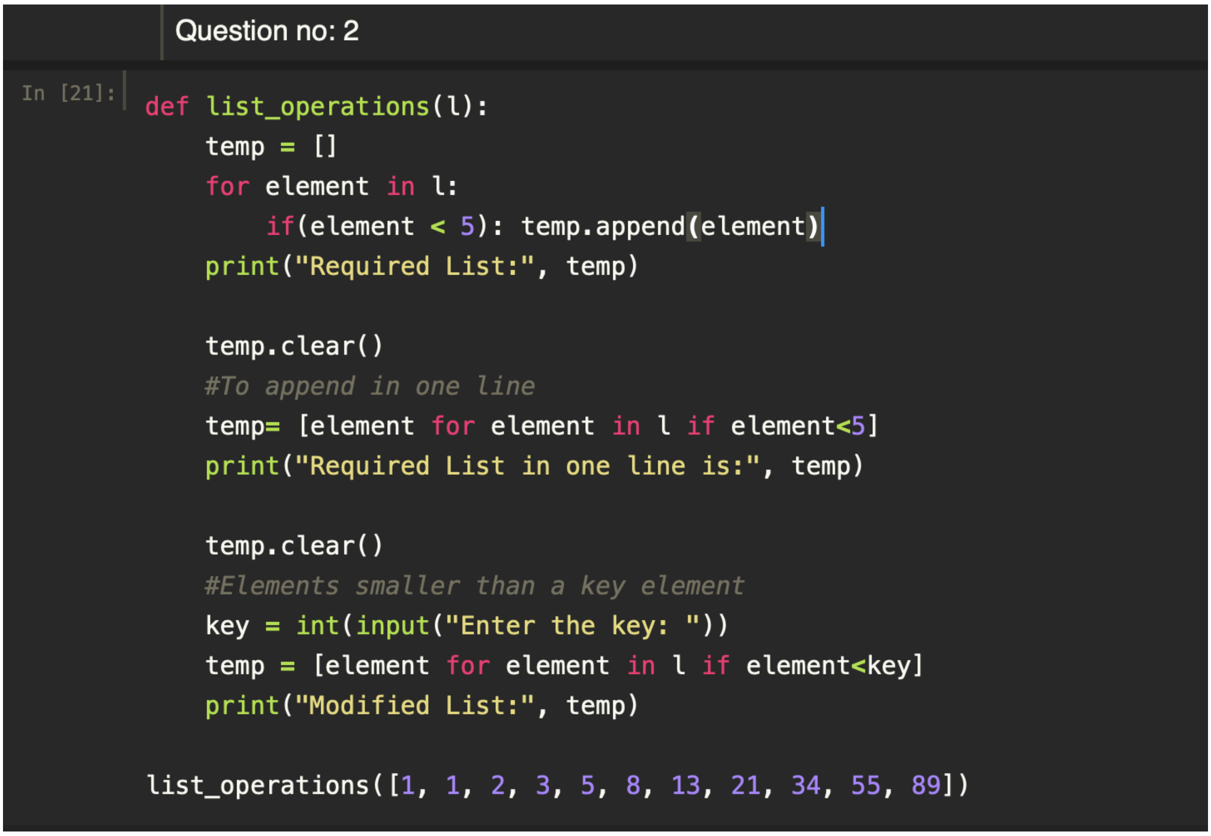


```
What is your name? Amanpreet Singh Saimbhi
What is your age? 21
How many copies do you want? 5
*********************************************
-> You will turn 100 in the year:  2100, Amanpreet Singh Saimbhi.
-> You will turn 100 in the year:  2100, Amanpreet Singh Saimbhi.
-> You will turn 100 in the year:  2100, Amanpreet Singh Saimbhi.
-> You will turn 100 in the year:  2100, Amanpreet Singh Saimbhi.
-> You will turn 100 in the year:  2100, Amanpreet Singh Saimbhi.
```

**Q2.** 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 that are smaller than that number given by the user.

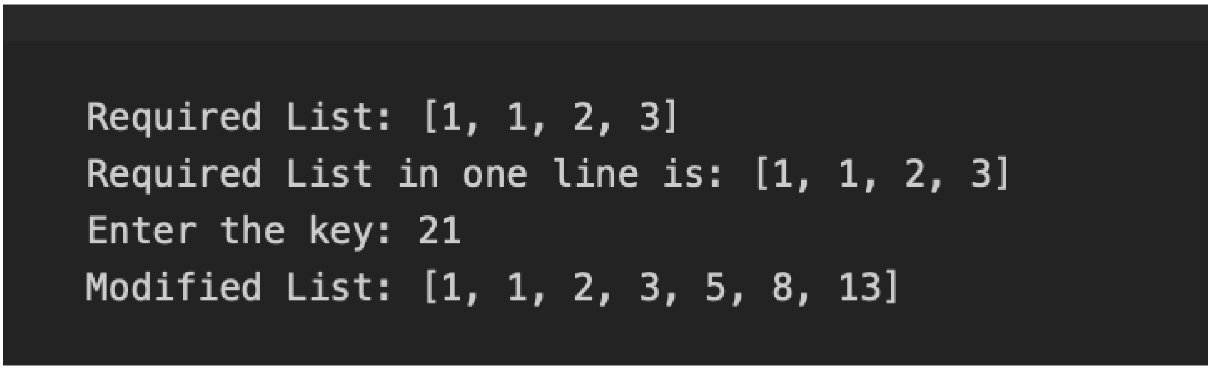
**Pseudocode:**

```
def list_operations(l):
    temp = []
    for element in l:
        if(element < 5): temp.append(element)
    print("Required List:", temp)

    temp.clear()
    #To append in one line
    temp= [element for element in l if element<5]
    print("Required List in one line is:", temp)

    temp.clear()
    #Elements smaller than a key element
    key = int(input("Enter the key: "))
    temp = [element for element in l if element<key]
    print("Modified List:", temp)

list_operations([1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89])
```



Question no: 2

```
In [21]:
def list_operations(l):
    temp = []
    for element in l:
        if(element < 5): temp.append(element)
    print("Required List:", temp)

    temp.clear()
    #To append in one line
    temp= [element for element in l if element<5]
    print("Required List in one line is:", temp)

    temp.clear()
    #Elements smaller than a key element
    key = int(input("Enter the key: "))
    temp = [element for element in l if element<key]
    print("Modified List:", temp)

list_operations([1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89])
```



```
Required List: [1, 1, 2, 3]
Required List in one line is: [1, 1, 2, 3]
Enter the key: 21
Modified List: [1, 1, 2, 3, 5, 8, 13]
```

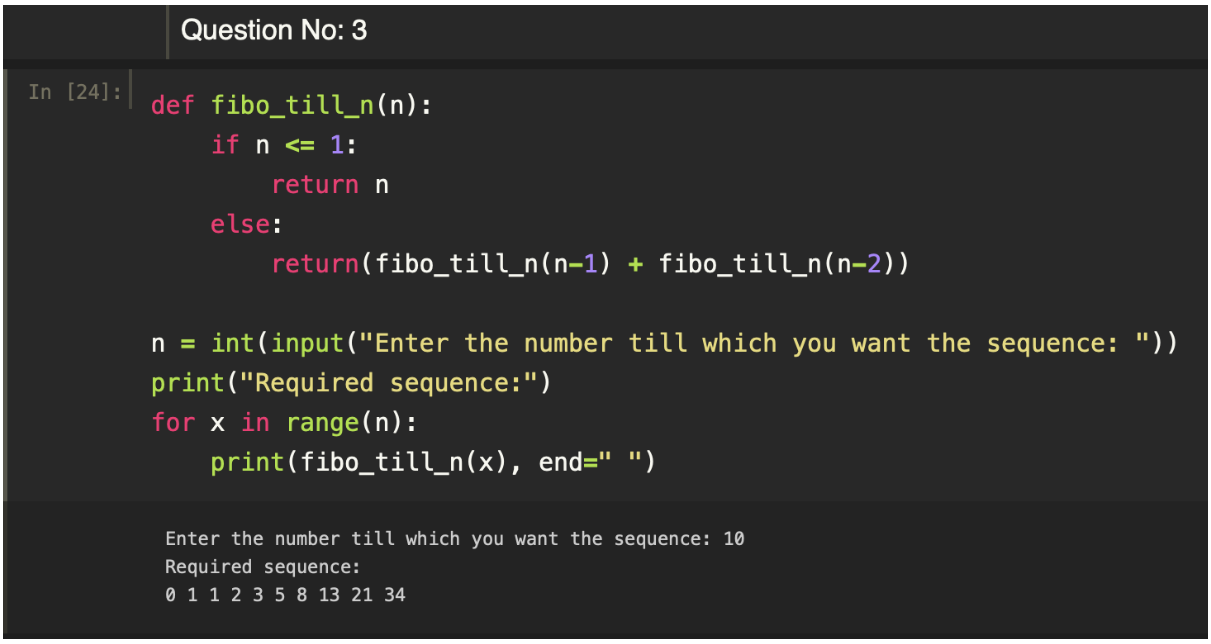
**Q3.** Write a program that asks the user how many Fibonacci numbers to generate and then generates them. Take this opportunity to think about how you can use functions. Make sure to ask the user to enter the number of numbers in the sequence to generate.(*Hint: The Fibonacci seqence is a sequence of 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:**

```
def fibo_till_n(n):
    if n <= 1:
        return n
    else:
        return(fibo_till_n(n-1) + fibo_till_n(n-2))

n = int(input("Enter the number till which you want the sequence: "))
print("Required sequence:")
for x in range(n):
    print(fibo_till_n(x), end=" ")
```

**Program Screenshot and Output:**



Question No: 3

```
In [24]: def fibo_till_n(n):
             if n <= 1:
                 return n
             else:
                 return(fibo_till_n(n-1) + fibo_till_n(n-2))

         n = int(input("Enter the number till which you want the sequence: "))
         print("Required sequence:")
         for x in range(n):
             print(fibo_till_n(x), end=" ")
```

```
Enter the number till which you want the sequence: 10
Required sequence:
0 1 1 2 3 5 8 13 21 34
```

**Q4.** 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.

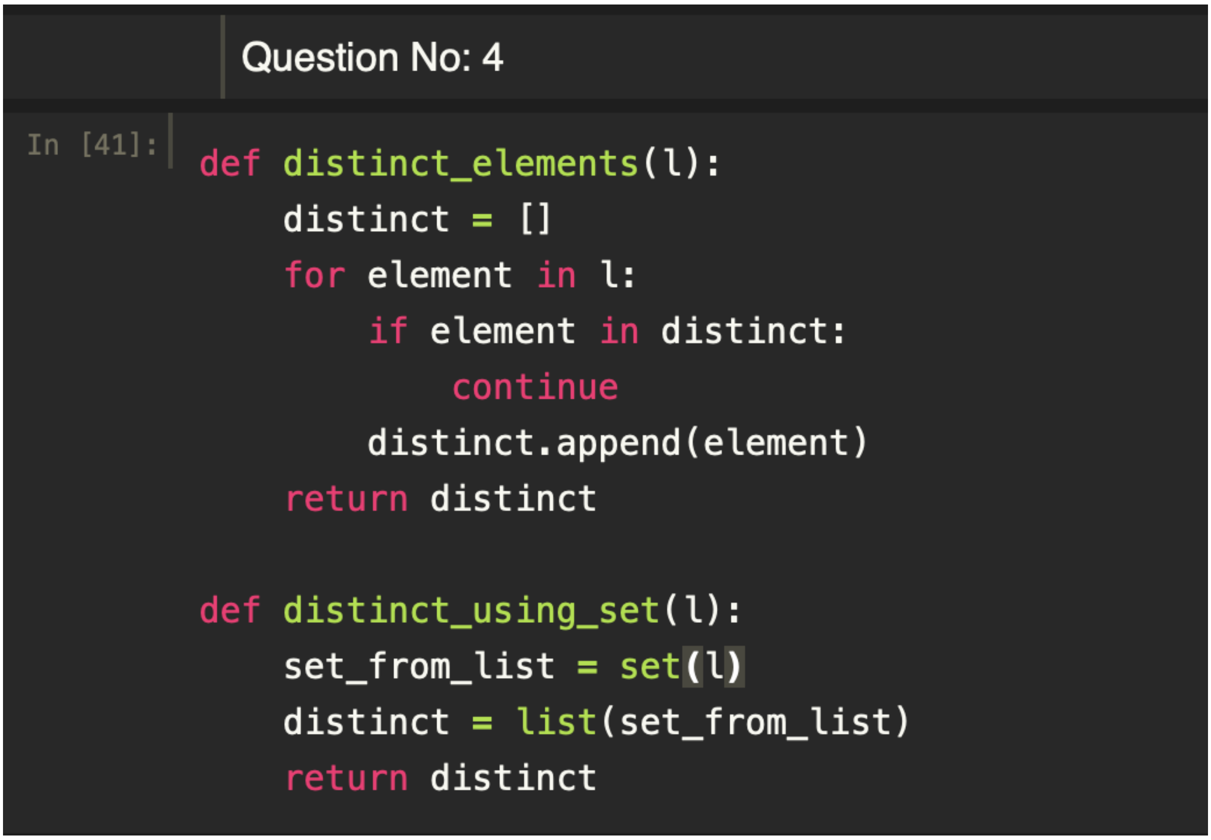
Extras:

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

**Pseudocode:**

```
def distinct_elements(l):
    distinct = []
    for element in l:
        if element in distinct:
            continue
        distinct.append(element)
    return distinct

def distinct_using_set(l):
    set_from_list = set(l)
    distinct = list(set_from_list)
    return distinct
```

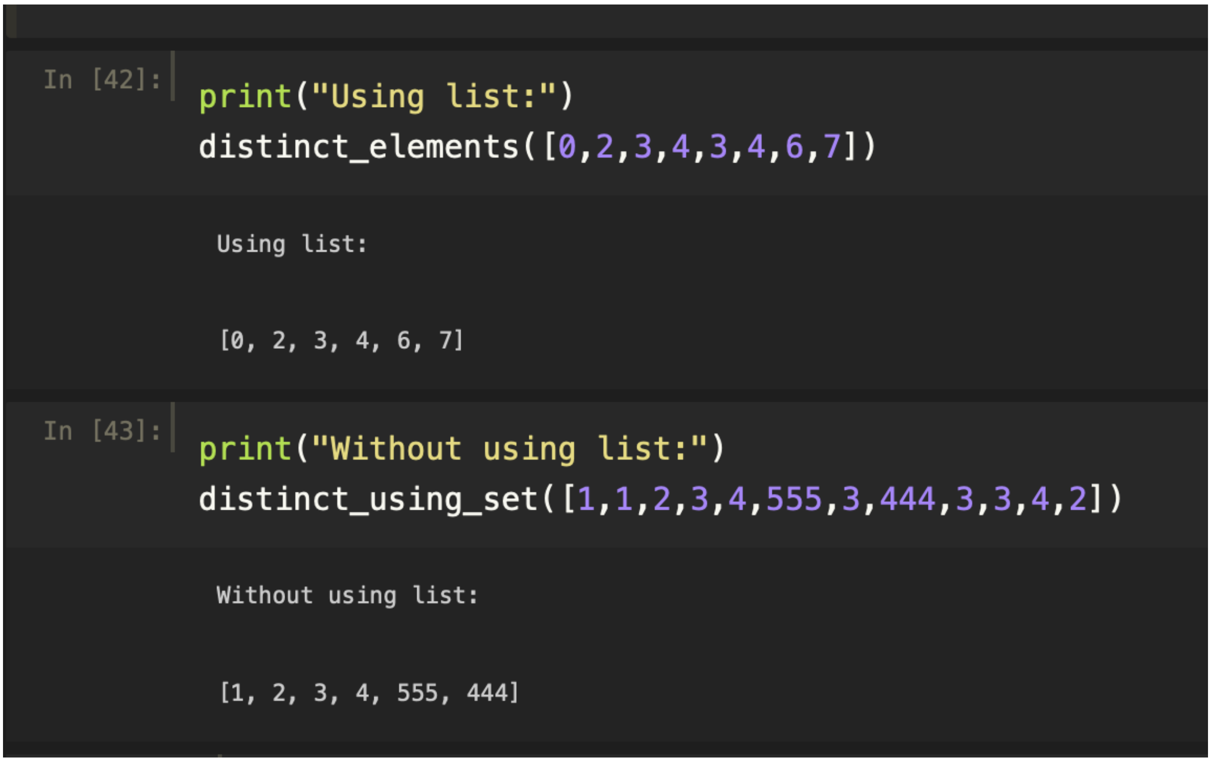
**Program Screenshot and Output:**



Question No: 4

In [41]:

```python
def distinct_elements(l):
    distinct = []
    for element in l:
        if element in distinct:
            continue
        distinct.append(element)
    return distinct

def distinct_using_set(l):
    set_from_list = set(l)
    distinct = list(set_from_list)
    return distinct
```



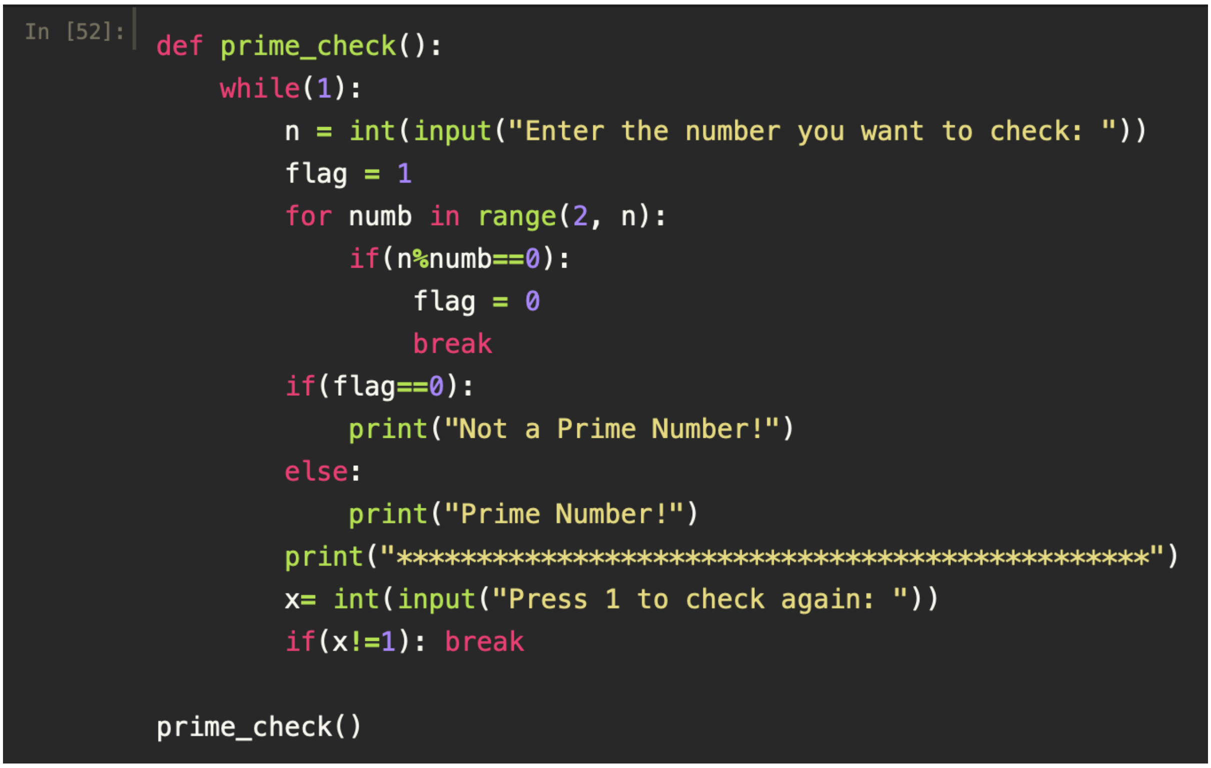
```
In [42]: print("Using list:")
         distinct_elements([0,2,3,4,3,4,6,7])

         Using list:

         [0, 2, 3, 4, 6, 7]

In [43]: print("Without using list:")
         distinct_using_set([1,1,2,3,4,555,3,444,3,3,4,2])

         Without using list:

         [1, 2, 3, 4, 555, 444]
```

**Q5.** 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

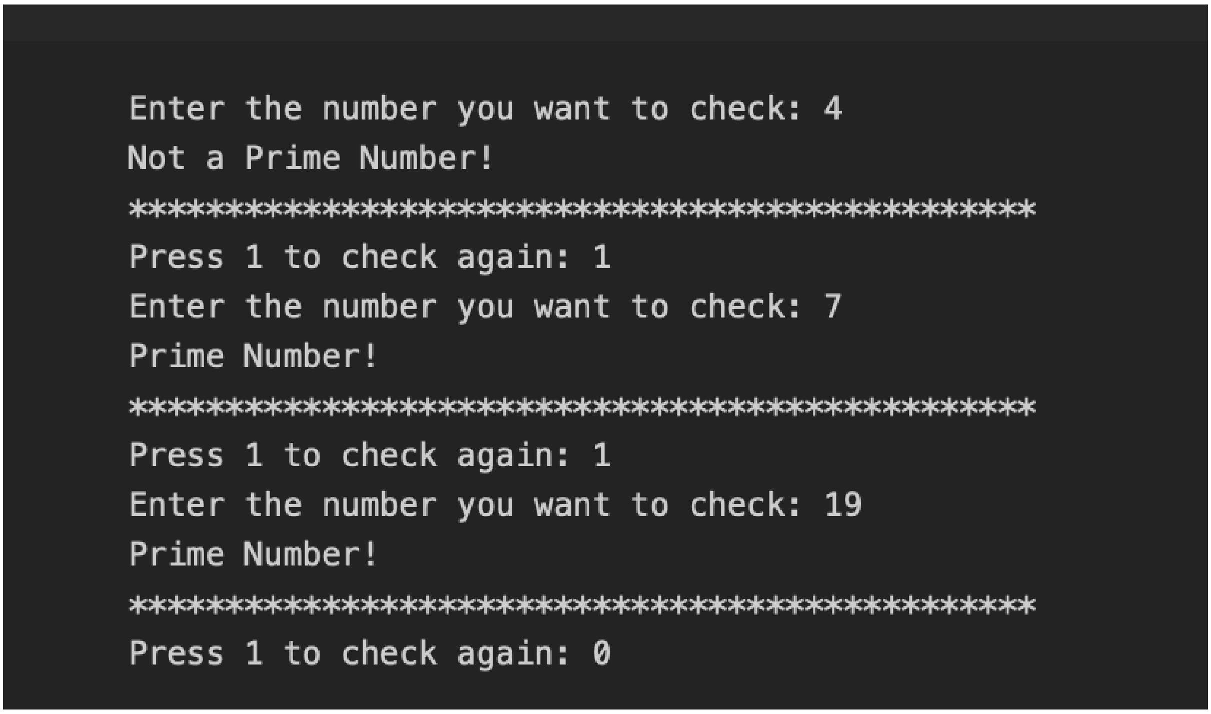
**Pseudocode:**

```
def prime_check():
    while(1):
        n = int(input("Enter the number you want to check: "))
        flag = 1
        for numb in range(2, n):
            if(n%numb==0):
                flag = 0
                break
        if(flag==0):
            print("Not a Prime Number!")
        else:
            print("Prime Number!")
        print("************************************************")
        x= int(input("Press 1 to check again: "))
        if(x!=1): break
```

**Program Screenshot and Output:**



```
In [52]: def prime_check():
             while(1):
                 n = int(input("Enter the number you want to check: "))
                 flag = 1
                 for numb in range(2, n):
                     if(n%numb==0):
                         flag = 0
                         break
                 if(flag==0):
                     print("Not a Prime Number!")
                 else:
                     print("Prime Number!")
                 print("***********************************************")
                 x= int(input("Press 1 to check again: "))
                 if(x!=1): break

         prime_check()
```



```
Enter the number you want to check: 4
Not a Prime Number!
***********************************************
Press 1 to check again: 1
Enter the number you want to check: 7
Prime Number!
***********************************************
Press 1 to check again: 1
Enter the number you want to check: 19
Prime Number!
***********************************************
Press 1 to check again: 0
```