Assignment – 1

Program -1

```
# Assignment1
# 1. Python Program to check Armstrong Number?

#   HINT : 153 = 1*1*1 + 5*5*5 + 3*3*3  // 153 is an Armstrong number.

num = int(input("Enter a number: "))
# function to check Armstrong number

'''
n = 153
Iteration 1:
153 > 0
digit = 3 (153 % 10)
n = 15 ( 153 / 10)
sum = 0 + 3 ** 3 = 27

Iteration 2:
15 > 0
digit = 5 (15 % 10)
n = 1 ( 15 / 10)
sum = 27 + 5 ** 3 = 27 + 125 = 152

Iteration 1:
1 > 0
digit = 1 (1 % 10)
n = 0.0 ( 1 / 10)
sum = 152 + 1 ** 3 = 152 + 1 = 153

'''

def armStg(n):
  sum = 0
  orn = n
  while (n > 0):
    digit = int(n % 10)
    n = int(n / 10)
    sum += digit ** 3

  if orn == sum:
    print(orn,"is an Armstrong number.")
  else:
    print(orn,"is not an Armstrong number.")
```

```
# invoking armStg function
armStg(num)
```

Output

```
Enter a number: 370
370 is an Armstrong number.
```

```
Enter a number: 115
115 is not an Armstrong number.
```

Program -2

```
#2. Python Program for How to check if a given number is Fibonacci numb
er?

#   HINT : A Fibonacci sequence is the integer sequence of 0, 1, 1, 2,
3, 5, 8....

#          The first two terms are 0 and 1.

#          All other terms are obtained by adding the preceding two ter
ms.

#          This means to say the nth term is the sum of (n-1)th and (n-
2)th term.

num = int(input("Enter a number:"))

# to check Fabonacci number
'''
Initially n1 = 0
n2 = 1
fabseries.append(n1) -> ['0']
fabseries.append(n2) -> ['0', '1']
nextnum = n1 + n2 -> 0+1 -> 1
fabseries.append(nextnum) -> ['0', '1', '1']
while loop:
  will execute till nextnum is less than or equal to n.
  will not execute if nextnum is greater than n.
suppose n = 3
1.  1 <= 3
    n1 = 1
    n2 = 1
    nextnum = 2
    fabseries ->  ['0', '1', '1', '2']
2.  2 <= 3
    n1 = 1
    n2 = 2
    nextnum = 3
    fabseries ->  ['0', '1', '1', '2' , '3']
2.  3 <= 3
    n1 = 2
    n2 = 3
    nextnum = 5
    fabseries ->  ['0', '1', '1', '2', '3' , '5']

'''
def fab(n):
  fabseries = []
```

```
  nextnum = 0
  ycount = 0
  ncount = 0
  if n == 0 or n == 1:
    print(num, "is a Fabonacci number.")
  n1 = 0
  n2 = 1
  fabseries.append(n1)
  fabseries.append(n2)
  nextnum = n1 + n2
  fabseries.append(nextnum)

  while (nextnum <= n):
    n1 = n2
    n2 = nextnum
    nextnum = n1 + n2
    fabseries.append(nextnum)
  #print (fabseries)
  for num in fabseries:
    if n == num:
      ycount += 1
    else:
      ncount -= 1
  # if n is in fabseries then, ycount = 1, ycount will increment to 1
  if ycount > 0:
     print( n," is a Fabonacci number")
  # if n is not in fabseries then, ycount = 0 and ncount < 0 , ncount w
ill decrement to negative numbers and ycount will remain 0.
  elif ycount == 0 and ncount < 0:
      print( n," is not a Fabonacci number")

fab(num)
```

Output

```
Enter a number:233
233  is a Fabonacci number
Enter a number:190
190  is not a Fabonacci number
```