```python
# fibonacci series
# 0 1 1 2 3 5 8 13 21 34

# 1 ---> 0
# 2 --->0 1
# 3 ---> 0 1 1

# for i in range(1,11):
#     print(i, end = ", ")

def fibonacci_seq(n):
  a = 0 # first number
  b = 1 # second number
  if n == 1:
    print(a)
  elif n == 2:
    print(a, b)
  else:
    print(a,b, end = " ")
    for i in range(n-2):
      c = a + b
      a = b
      b = c
      print(b , end = " ")

fibonacci_seq(120)
```

```
0 1 1 2 3 5 8 13 21 34 55 89 144 233 377 610 987 1597 2584 4181 6765 10946 17711 28657 46368 75025 121393 196418 317811 514229 832040 13
```

```python
# default parameters


def user_info(first_name, last_name, age = 23):
  print(f"your first name is {first_name}")
  print(f"your last name is {last_name}")
  print(f"you age is {age}")

user_info('Akshay','Verma')
```

```
    your first name is Akshay
    your last name is Verma
    you age is 23
```

```python
# variable scope
x = 5 # global variable

def func():
  global x
  x = 7 # Local variable
  return x
print(x)
print(func())
print(x)
```

```
    5
    7
    7
```

```python
 # Intro to list

 # you can store anything in Lists int, float, string

 numbers = [1, 2, 3, 4]
 print(numbers)

 words = ["word1", "word2", 'word3' ]
 print(words)
```

```
 mixed = [1, 2, 3, 4, "five", "six", 2.3, None]
 print(mixed)


    [1, 2, 3, 4]
    ['word1', 'word2', 'word3']
    [1, 2, 3, 4, 'five', 'six', 2.3, None]
```

```
# Add data to list

fruits = ['grapes', 'apple']
fruits.append('mango') # (append is used to add the object in last place).

print(fruits)

    ['grapes', 'apple', 'mango']
```

```
# insert method is used to add the object in Last place

fruits1 = ['mango', 'orange']
fruits1.insert(2, "grapes")
print(fruits1)

    ['mango', 'orange', 'grapes']
```

```
# how to join (concatenate) two List

fruits1 = ['mango', 'orange']
fruits2 = ['grapes', 'apple']
fruits = fruits1 + fruits2
print(fruits)

    ['mango', 'orange', 'grapes', 'apple']
```

```
# extend method it is used list inside list

fruits1 = ['mango', 'orange']
fruits2 = ['grapes', 'apple']
fruits1.extend(fruits2)
print(fruits1)
print(fruits2)
```
```
 ⊏→  ['mango', 'orange', 'grapes', 'apple']
    ['grapes', 'apple']
```

```
# comman method to delete data from List

# pop method is used to delete the object into list.

fruits = ['orange', 'mango', 'apple', 'banana', 'kiwi', 'pear']
fruits.pop(4)
print(fruits)


    ['orange', 'mango', 'apple', 'banana', 'pear']
```

```
# comman method to delete data from List

# del method

fruits = ['orange', 'mango', 'apple', 'banana', 'kiwi', 'pear']
del fruits[1]
print(fruits)


    ['orange', 'apple', 'banana', 'kiwi', 'pear']
```

```
# comman method to delete data from list
# removed method

fruits = ['orange', 'mango', 'apple', 'banana', 'kiwi', 'pear']
fruits.remove('banana')
```

```
print(fruits)
```

```
['orange', 'mango', 'apple', 'kiwi', 'pear']
```

```
# In keyword with list
```

```
fruits = ['orange', 'mango', 'apple', 'banana', 'kiwi', 'pear']

if 'mango' in fruits:
  print("mango is present ")
else:
  print("mango is not present")
```

```
mango is present
```

```
# count method
```

```
fruits = ['orange', 'mango', 'apple', 'banana', 'kiwi', 'pear']
print(fruits.count('orange'))
```

```
1
```

```
# sort method it is used print in alphabate order
```

```
fruits = ['orange', 'mango', 'apple', 'banana', 'kiwi', 'pear']
fruits.sort()
numbers = [3, 5, 1, 0, 2, 8]
numbers.sort()
print(numbers)
print(fruits)
```

```
[0, 1, 2, 3, 5, 8]
['apple', 'banana', 'kiwi', 'mango', 'orange', 'pear']
```

```
# sorted function
```

```
fruits = ['orange', 'mango', 'apple', 'banana', 'kiwi', 'pear']
numbers = [3, 5, 1, 0, 2, 8]
print(sorted(numbers))
print(fruits)
```

```
[0, 1, 2, 3, 5, 8]
['orange', 'mango', 'apple', 'banana', 'kiwi', 'pear']
```

```
# clear method
```

```
fruits = ['orange', 'mango', 'apple', 'banana', 'kiwi', 'pear']
numbers = [3, 5, 1, 0, 2, 8]
numbers.clear()
print(numbers)
print(fruits)
```

```
[]
['orange', 'mango', 'apple', 'banana', 'kiwi', 'pear']
```

```
# copy method
# sorted function
```

```
fruits = ['orange', 'mango', 'apple', 'banana', 'kiwi', 'pear']
numbers = [3, 5, 1, 0, 2, 8]
numbers_copy = numbers.copy()
fruits_copy = fruits.copy()
print(numbers_copy)
print(fruits_copy)
```

```
[3, 5, 1, 0, 2, 8]
['orange', 'mango', 'apple', 'banana', 'kiwi', 'pear']
```

```python
# split method
user_info = 'Akshay 12'.split()
print(user_info)
```

```
['Akshay', '12']
```

```python
# Join method

user_info = ['Akshay', '15']
print(','.join(user_info))
```

```
Akshay,15
```

```python
# List vs array

# c, c++, java
# array int, string

# List - store any data / flexible

# python array module - fix data type
# numpy arrays - binding with c libraries
# javascript array = python Lists / flexible



# strings are immutable
# Lists are mutable

s = "string"
t = s.title()
print(s)

l = ['word1', 'word2', 'word3']
l.pop(1)
print(l)
```

```
string
['word1', 'word3']
```