1. **Find outputs (Home work)**

```
a = range(10 , 50 , 5)

print(type(a)) #class ‘range’

print(a) #range(10, 50, 5)

print(*a) #10 15 20 25 30 35 40 45

print(id(a)) #Some random address asssigned by the IDE

print(len(a)) #8

print(*a[2 : 7] , sep = ' , ') #Start from index 2 to 6 in steps of 1 i.e. 20 , 25 , 30 , 35 , 40

print(*a[ : : -1]) #Reverse i.e. 45 40 35 30 25 20 15 10

a[4] = 32 #Error #Reason is that range object is immutable

print(a * 2) ‘’’Error - Reason range object won’t permit duplicates and repetitions leads to duplicates which is not permitted’’’
```

2. **Find outputs (Homework)**

```
a = range(10 , 20) #Starts from index 10 to 19 in steps of 1

print(*a , sep = ',') #10,11,12,13,14,15,16,17,18,19

b = range(5) #Starts from index 0 to 4 in steps of 1

print(*b) #0 1 2 3 4

c = range(10 , 1 , -1) #Starts from index 10 to 2 in steps of -1

print(*c , sep = '...') #10...9...8...7...6...5...4...3...2

d = range(-10 , 0) #Starts from index -10 to -1 in steps of 1

print(*d) # -10 -9 -8 -7 -6 -5 -4 -3 -2 -1

e = range(-10)
```

print(*e) #Empty string - starts at 0 and can’t count up to -10

f = range(2 , 2)

print(*f) #Empty string - as both start and end are same

g = range(10 , 11 , 0.1) ‘’’Error - Reason is that range object doesn’t contain float objects but only integer objects’’’

h = range('A' , 'F') ‘’’Error - Reason is that range object doesn’t contain float objects but only integer objects’’’

3. **Find outputs (Homework)**

r = range(10 , 17 , 3) #Starts at index 10 to 16 in steps of 3

a , b , c = r

print(a , b , c) #10 13 16

r = range(3)

x , y = r

p , q , r , s = r

a , b , c = *r

m = r

print(id(r)) #Some random address assigned by the IDE

print(id(m)) #Same random address assigned by the IDE to r as m = r

4. **Find outputs (Homework)**

a = [25 , 10.8 , 'Hyd' , True , 3 + 4j , None , 'Hyd' , 25]

print(a) #[25, 10.8, 'Hyd', True, 3+4j, None, 'Hyd', 25]

print(*a) # 25<space>10.8<space>Hyd<space>True<space>3+4j<space>None<space>Hyd<space>25

print(type(a)) #class ‘list’

print(id(a)) #Some random address assigned by the IDE

```
print(len(a)) #8

a[2] = 'Sec'

print(a) #[25, 10.8, 'Sec', True, 3+4j, None, 'Hyd', 25]

print(a[2 : 5]) #Starts from index 2 to 4 in steps of 1 i.e. #['Sec', True, 3+4j]
```

5. **append() and remove() methods (Home work)**

```
a = [ ]

print(a) #[ ]

a . append(25)

a . append(10.8)

a . append('Hyd')

a . append(True)

print(a) #[25, 10.8, ‘Hyd’, True]

a . remove('Hyd')

print(a) #[25, 10.8, True]

a . remove('25') #Error #Reason is that ‘25’ is not in the list to be removed

print(a) #[25, 10.8, True]
```

6. **Find outputs (Homework)**

```
a = [25 , 10.8 , 'Hyd']

print(a) #[25, 10.8, 'Hyd']

print(id(a)) #Some random address assigned by the IDE to reference ‘a’

print(a * 3) #[25, 10.8, 'Hyd', 25, 10.8, 'Hyd', 25, 10.8, 'Hyd']

print(a * 2) #[25, 10.8, 'Hyd', 25, 10.8, 'Hyd']
```

```
print(a * 1) #[25, 10.8, 'Hyd']

print(a * 0) #[ ] Empty List

print(a * -1) #[ ] Empty List

print(a * 4.0) #Error #Reason is that usage of float object instead of integer for repetition via '*' operator

a = a * 3

print(a) #[25, 10.8, 'Hyd', 25, 10.8, 'Hyd', 25, 10.8, 'Hyd']

print(id(a)) #Same random address assigned by the IDE to the reference 'a'

a = [25]

print(a , id(a)) #[25] #Some random address assigned by the IDE

print(a * a) #Error # Reason is a list can't be repeated list times
```

7. **list() function demo program**

```
a = list('Hyd')

print(a) #['H', 'y', 'd']

print(type(a)) #class 'list'

print(len(a)) #3

b = (10 , 20 , 15 , 18)

print(list(b)) #[10 , 20 , 15 , 18]

print(list(range(5))) #[0, 1, 2, 3, 4]

print(list(25)) #Error #Reason int object is a non-sequence to convert into a list a sequence object is needed
```

8. **Find outputs**

```
a = [ ]

print(type(a)) #class 'list'
```

```
print(a) #[ ]

print(len(a)) #0

b = list()

print(b) #[ ]

print(len(b)) #0
```

9. Slice demo program (Homework)

```
list = [25 , 10.8 , 3 + 4j , 'Hyd' , True , None , 10.8 , 'Hyd']

print(list[2 : 7]) #list[2 : 7 : 1] -> List from indexes 2 to 6 in steps of 1 i.e. [3+4j, 'Hyd', True, None, 10.8]

print(list[ : : ]) ‘’’list[0 : 8 : 1] -> Full list from start to end in steps of 1 i.e. [25, 10.8, 3+4j, 'Hyd', True, None, 10.8, 'Hyd']’’’

print(list[:]) ‘’’list[0 : 8 : 1] -> Full list from start to end in steps of 1 i.e. [25, 10.8, 3+4j, 'Hyd', True, None, 10.8, 'Hyd']’’’

print(list[ : : -1]) #list[-1 : -9 : -1] -> Full list in reverse order i.e. ['Hyd', 10.8, None, True, 'Hyd', 3+4j, 10.8, 25]

print(list[ : : 2]) #list[0 : 8 : 2] -> List from indexes 0 to 7 in steps of 2 i.e. [25 , 3+4j , True , 10.8]

print(list[1 : : 2]) #list[1 : 8 : 2] -> List from indexes 1 to 7 in steps of 2 i.e. [10.8, 'Hyd', None, 'Hyd']

print(list[ : : -2]) #list[-1 : -9 : -2] -> List from index -1 down to -8 in steps of -2 i.e. ['Hyd', None, 'Hyd', 10.8]

print(list[-2 : : -2]) #list[-2 : -9 : -2] -> List from indexes -2 to -8 in steps of -2 i.e. [10.8 , True , 3+4j , 25]

print(list[1 : 4]) #list[1 : 4 : 1] -> List from indexes 1 to 3 in steps of 1 i.e. [10.8, 3+4j, 'Hyd']

print(list[-4 : -1]) #list[-4 : -1 : 1] -> List from indexes -4 to -2 in steps of 1 i.e. [True, None, 10.8]

print(list[3 : -3]) #list[3 : 5 : 1] -> List from indexes 3 to 4 in steps of 1 i.e. ['Hyd', True]

print(list[2 : -5]) #list[2 : 3 : 1] -> List from index 2 to 2 in steps of 1 i.e. [3+4j]

print(list[-1:-5]) #list[-1 : -5 : 1] -> Empty list because step +1 cannot go from -1 to -5 i.e. []
```

10. Find outputs (Homework)

```
list = [25 , 10.8 , 3+4j , 'Hyd' , True , None , 10.8 , 'Hyd']

x , y = list[3 : 5]

print('x : ' , x) #x: 'Hyd'

print('y : ' , y) #y: True

for x in list[2:7]:

    print(x) #3+4j<next line>'Hyd'<next line>True<next line>None<next line>10.8<next line>
```

11. Find outputs (Homework)

```
a = [10 , 20 , 30 , 40 , 50]

print(a , id(a)) # [10 , 20 , 30 , 40 , 50]<space> Some random address assigned by the IDE to ref 'a'

a[1 : 4] = [60 , 70]

print(a , id(a)) # [10 , 60 , 70 , 50]<space>Same random address assigned by the IDE to ref 'a'

a[2: 4] = [100 , 200 , 300]

print(a , id(a)) # [10, 60, 100, 200, 300]]<space>Same random address assigned by the IDE to ref 'a'
```

12. Find outputs (Homework)

```
a = [25]

print(a[1]) #Error #Reason no index found to retrieve

print(a[1:]) #Empty list because the starting index 1 does not exist in a list of length 1
```