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Assesment-2

1. **The use of "?" after any function in python.**

```
In [3]: range? #? is a help command
```

```
Init signature: range(self, /, *args, **kwargs)
Docstring:
range(stop) -> range object
range(start, stop[, step]) -> range object

Return an object that produces a sequence of integers from start (inclusive)
to stop (exclusive) by step.  range(i, j) produces i, i+1, i+2, ..., j-1.
start defaults to 0, and stop is omitted!  range(4) produces 0, 1, 2, 3.
These are exactly the valid indices for a list of 4 elements.
When step is given, it specifies the increment (or decrement).
Type:           type
Subclasses:
```

Observation: Here in python the "?" is used as the "help command". If we want to just use any in built function but we don't know how to use we can use the "?".

2. **Normal using range function.**

```
In [4]: range (10) #just to display range value from start to end
Out[4]: range(0, 10)
```

Observation: Here just to see how the range function uses the value from starting to the end. Here we gave the range value just stop value i.e. 10 that means it will take value from 0 up to 9.

3. **Using "for" loop using range in python.**

```
In [8]: for i in range(10):
            print(i)
0
1
2
3
4
5
6
7
8
9
```

Observation: Using the “for” loop to print numbers in sequence. In python the “for” loop uses the range and in python we have to put the “:” at the end and after that it is intended in another line. As shown the print line is being intended.

4. **Display the sentence using for loop.**

```
In [9]: for i in range(7):
            print("I loved the weather Today in vellore")
```

```
I loved the weather Today in vellore
I loved the weather Today in vellore
I loved the weather Today in vellore
I loved the weather Today in vellore
I loved the weather Today in vellore
I loved the weather Today in vellore
I loved the weather Today in vellore
```

Observation: To print the whole sentence using “for” loop just to give the range how many times we want to print and give the sentence which we want to display.

5. **Calculate cubes of first 10 numbers using while loop**

```
In [16]: #cubes using while loop
         i=1
         while i<11:
             print(i**3)
             i=i+1
```

```
1
8
27
64
125
216
343
512
729
1000
```

Observation: Using while loop there is one disadvantage is that we have to increment the variable but in “for” loop need not do explicitly just range manages it.

6. **Step count in for loop.**

```
In [17]: for i in range (1,11,3):#step count by giving the value 3
             print(i)

1
4
7
10
```

Observation: In range we have three different arguments like one is start, stop and last is the step count i.e. after how many step the loop should continue. For example I have taken 3 as step count that means from start after 3 count only the loop will continue.

7. **Just to check the time of execution of "for" loop and "while" loop.**

```
In [23]: #check the time of while and for loop
         import time
         start_time = time.time()
         i=1
         while i<11:
             print(i**3)
             i=i+1
         end_time = time.time()
         print("Time taken for while loop:",end_time - start_time)

         #for loop
         start_time = time.time()
         for i in range(1,11):
             print(i**3)
         end_time = time.time()
         print("The time taken for for loop:",end_time - start_time)

1
8
27
64
125
216
343
512
729
1000
Time taken for while loop: 0.004050731658935547
```

```
Time taken for while loop: 0.004050731658935547
1
8
27
64
125
216
343
512
729
1000
The time taken for for loop: 0.0
```

Observation: Here we have used time package for just to see the start and end time of the loop for both the different loops. The start time and end time variable are used to display the overall time taken by both the loops.

8. **Use of "def" in python.**

```
In [28]: #using def
         def cube(a):#function description
                 r = a**3
                 return r
         for i in range (1,11):
             result = cube(i)#calling function
             print(result)
```

```
1
8
27
64
125
216
343
512
729
1000
```

Observation: Def means a function as in other programming language. Def works same as the other function like def keyword function name parameters if needed and then colon and indented and then we can describe the function and it can be called as usual calling function. In the above example we are trying to calculate the cubes of first 10 numbers cubes.

9. **To make use of the "Math" function in python.**

```
In [12]: #5 mathematical functions
         import math as m
         a = m.sqrt(16) #sqrt function
         print(a)

         b = m.factorial(6)#factorial function to directly calculate
         print(b)

         c = m.pow(3,2)#power function to calculate power of any number
         print(c)

         d = m.gcd(4,5)#greatest common divisor of the given number
         print(d)

         e = m.log(2,2)#logarithmic value of the given number
         print(e)
```

```
4.0
720
9.0
1
1.0
```

Observation: We can import the “Math” function if any mathematical complicated calculation to be done for the simplicity just we can access the function by just importing the package. We can different functions as listed in the above are to find factorial, to find power of the number, to find gcd, to find log and to find sqrt other than this there are many nut some are used here.

10.To explore more about importing a package.

```
In [1]: c = m.pow(3,2)# we have imported the math file in another cell and when we shutdown and open again use that imported file in ano
        print(c)

---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
<ipython-input-1-e941a00bf216> in <module>
----> 1 c = m.pow(3,2)# we have imported the math file in another cell and when we shutdown and open again use that imported fi
le in another cell it will give error
      2 print(c)

NameError: name 'm' is not defined
```

Observation: Here we have imported the math package in different cell but we have tried to execute the math function in another cell it will execute at the same time because of the checkpoints but when we shut down the jupyter notebook and open and run again the same cell without running the cell where math is imported we get the error that math is not defined as shown in the above example.