**Recap:**

1. Module 1 recap
2. Congratulations on passing Module 1

**Learning Outcomes:**

1. Recap functions being used to repeat similar actions
2. Introduction to lists and for loops

* Loop through strings
* Loop through lists

1. List Indexing
2. Introduction to Range(), Range (start, stop), Range(start,stop,step)

-Concept of step Counter

- Concept of len

1. List Slicing
2. Slicing values in a range – Converting range to list
3. Concept of sum in lists and range
4. Creating multiplication table with for loops

**Explanation Points:**

* Explain the rationale on why we use For Loops
* Basic introduction to sequences
* Understanding of Start, Stop, Step
* Recognize that there are multiple ways of solving one question

**Breakdown of Lesson Plan:**

|  |  |
| --- | --- |
| Lesson 1.1 (Repetition in Programming) | 10 min |
| Lesson 1.2 (Basic For Loops with Strings)  Remember to explain task 7 | 15 min |
| Lesson 1.3 (Range functions and Counters) | 20 min |
| Lesson 1.4 (List Indexing) | 10 min |
| Lesson 1.5 (List Slicing) | 15 min |
| Lesson 1.6 (List Typecasting) | 10 min |
| Lesson 1.7 (Finding sum of a list) | 20 min |
| Lesson 1.8 (Multiplication Table) | 10 min |
| Lesson 1 Quiz | 20 min |

*\*Note: There is a high chance of student not being able to complete on time.*

**Lesson 1.1**

**While coding, it is unavoidable for us to repeat certain commands or actions multiple times in succession. So far, we have learnt how to deal with it by using functions to repeat the similar actions as such. In the example below, we are looking at getting the output in a sequence starting from 6 and ending at 10.**

***Output***

|  |  |
| --- | --- |
| ***1*** | ***def add(x,y):*** |
| ***2*** | ***print(x+y)*** |
| ***3*** | ***return(x+y)*** |
| ***4*** |  |
| ***5*** | ***A = 5*** |
| ***6*** | ***B = add(A,1)*** |
| ***7*** | ***C = add(B,1)*** |
| ***8*** | ***D = add(C,1)*** |
| ***9*** | ***E = add (D,1)*** |
| ***10*** | ***F = add(E,1)*** |

|  |  |
| --- | --- |
| ***1*** | ***6*** |
| ***2*** | ***7*** |
| ***3*** | ***8*** |
| ***4*** | ***9*** |
| ***5*** | ***10*** |

**Using functions is indeed useful, especially in making long calculations shorter. Let us revise on this concept!**

|  |
| --- |
|  |

Type the following and fill in the output after pressing F5

*\*The numbers represent the lines.*

Task 1: Using functions, output the numbers starting from 15 to 5 as shown in the output. Complete lines 2,3,5 and 6

Output

|  |  |
| --- | --- |
| 1 | def funct(x,y): |
| 2 | print |
| 3 | return |
| 4 |  |
| 5 | Start= |
| 6 | Count= |
| 7 |  |
| 8 | Z=funct(Start,Count) |
| 9 | Y=funct(Z,Count) |
| 10 | X=funct(Y,Count) |
| 11 | W=funct(X,Count) |
| 12 | V=funct(W,Count) |
| 13 | U=funct(V,Count) |

|  |  |
| --- | --- |
| *1* | 15 |
| *2* | 13 |
| *3* | 11 |
| *4* | 9 |
| *5* | 7 |
| *6* | 5 |

**Lesson 1.1**

Task 2: Using functions, output the numbers starting from 100 to 600 as shown in the output.

Output

|  |  |
| --- | --- |
| 1 | def funct(x,y): |
| 2 |  |
| 3 |  |
| 4 |  |
| 5 | Start= |
| 6 | Count= |
| 7 |  |
| 8 | Z=funct(Start,Count) |
| 9 | Y=funct(Z,Count) |
| 10 | X=funct(Y,Count) |
| 11 | W=funct(X,Count) |
| 12 | V=funct(W,Count) |
| 13 | U=funct(V,Count) |
|  |  |

|  |  |
| --- | --- |
| *1* | 100 |
| *2* | 200 |
| *3* | 300 |
| *4* | 400 |
| *5* | 500 |
| *6* | 600 |

Task 3: Using functions, output the numbers starting from 5 in multiples of 5 as shown in the output.

Output

|  |  |
| --- | --- |
| 1 | def funct(x,y): |
| 2 |  |
| 3 |  |
| 4 |  |
| 5 |  |
| 6 |  |
| 7 |  |
| 8 |  |
| 9 |  |
| 10 |  |
| 11 |  |

|  |  |
| --- | --- |
| *1* | 5 |
| *2* | 10 |
| *3* | 15 |

**Lesson 1.2**

**Although functions can help us shorten the amount of time, the examples in Lesson 1.1 clearly show how difficult and tiring it is to do so. Hence, we can use loops to help us shorten the time.**

**There are 2 types of loops in Python – While loop and For Loop**

**For Loop is used for iterating over a sequence (that is either a list or a string)**

**Python For Loop syntax:**

**For iterating variable in a sequence:**

**statement block**

**print(statement)**

**The iterating variable gets assigned with the successive values from the input sequence**

**The sequence may refer to python objects such as list or string**

**Example of showing For Loop through string**

***Output***

|  |  |
| --- | --- |
| ***1*** | ***for letter in “python”:*** |
| ***2*** | ***print(letter)*** |

|  |  |
| --- | --- |
| ***1*** | ***p*** |
| ***2*** | ***y*** |
| ***3*** | ***t*** |
| ***4*** | ***h*** |
| ***5*** | ***o*** |
| ***6*** | ***n*** |

[**List**](https://www.programiz.com/python-programming/list) **is an ordered sequence of items. It is changeable and allows for duplicate members**

**All the items in a list do not need to be of the same type.**

**Declaring a list: Items are separated by commas, enclosed within brackets [ ].**

***Example of showing For Loop through list***

***Output***

|  |  |
| --- | --- |
| ***1*** | ***list1=[1,2,3,4,5,6]*** |
| ***2*** | ***for i in list1:*** |
| ***3*** | ***print(i)*** |

|  |  |
| --- | --- |
| ***1*** | ***1*** |
| ***2*** | ***2*** |
| ***3*** | ***3*** |
| ***4*** | ***4*** |
| ***5*** | ***5*** |
| ***6*** | ***6*** |

**Lesson 1.2**

For Task 1 to 8, we will be looping through strings

Task 1:

Output

|  |  |
| --- | --- |
| 1 | for name in “tan”: |
| 2 | print(name) |

|  |  |
| --- | --- |
| *1* |  |
| *2* |  |
| *3* |  |

Task 2:

Output

|  |  |
| --- | --- |
| *1* | for sound in “boo”: |
| *2* | print(sound) |

|  |  |
| --- | --- |
| *1* |  |
| *2* |  |
| *3* |  |

Task 3:

Output

|  |  |
| --- | --- |
| *1* | for pitch in “high”: |
| *2* | print(pitch) |

|  |  |
| --- | --- |
| *1* |  |
| *2* |  |
| *3* |  |
| *4* |  |

Task 4:

Output

|  |  |
| --- | --- |
| *1* | for height in “short”: |
| *2* | print(height) |

|  |  |
| --- | --- |
| *1* |  |
| *2* |  |
| *3* |  |
| *4* |  |
| *5* |  |

Task 5:

Output

|  |  |
| --- | --- |
| *1* | height=’abcd’ |
| *2* | for x in height: |
| *3* | print(x) |

|  |  |
| --- | --- |
| *1* |  |
| *2* |  |
| *3* |  |
| *4* |  |

**Lesson 1.2**

Task 6:

Output

|  |  |
| --- | --- |
| *1* | weight = ‘Hi there’ |
| *2* | for fat in weight: |
| *3* | print(fat) |

|  |  |
| --- | --- |
| *1* |  |
| *2* |  |
| *3* |  |
| *4* |  |
| *5* |  |
| *6* |  |
| *7* |  |
| *8* |  |

Task 7:

Output

|  |  |
| --- | --- |
| *1* | fruit = ‘cake’ |
| *2* | for type in fruit: |
| *3* | print(fruit) |

|  |  |
| --- | --- |
| *1* |  |
| *2* |  |
| *3* |  |
| *4* |  |

Task 8:

Output

|  |  |
| --- | --- |
| *1* | colour = ‘1234567’ |
| *2* | for red in colour: |
| *3* | print(red) |

|  |  |
| --- | --- |
| *1* |  |
| *2* |  |
| *3* |  |
| *4* |  |
| *5* |  |
| *6* |  |
| *7* |  |

**Lesson 1.2**

For Task 9 to 12, we will be looping through list

Task 9:

Output

|  |  |
| --- | --- |
| *1* | list1 = [1,2,3,4,5,6,7] |
| *2* | for numbers in list1: |
| *3* | print(numbers) |

|  |  |
| --- | --- |
| *1* |  |
| *2* |  |
| *3* |  |
| *4* |  |
| *5* |  |
| *6* |  |
| *7* |  |

Task 10:

Output

|  |  |
| --- | --- |
| *1* | list2 = [“one”,”two”,”three”,”four”,”five”] |
| *2* | for numberwords in list2: |
| *3* | print(numberwords) |

|  |  |
| --- | --- |
| *1* |  |
| *2* |  |
| *3* |  |
| *4* |  |
| *5* |  |

Task 11: Create a list named list 3. Using for loops, print the output as shown

Output

|  |  |
| --- | --- |
| *1* |  |
| *2* |  |
| *3* |  |

|  |  |
| --- | --- |
| *1* | 100 |
| *2* | 200 |
| *3* | 300 |
| *4* | 400 |
| *5* | 500 |

Task 12: Create a list named list 4. Using for loops, print the output as shown

Output

|  |  |
| --- | --- |
| *1* |  |
| *2* |  |
| *3* |  |

|  |  |
| --- | --- |
| *1* | L |
| *2* | O |
| *3* | G |
| *4* | I |
| *5* | C |

**Lesson 1.3**

**The range() function returns a sequence of numbers, starting from index 0 by default, and increments by 1 (by default), and ends at a specified number.**

**The range(n) is of exclusive nature that is why it doesn’t include the last number in the output.  i.e., The given endpoint is never part of the generated result.**

**3 types of range function**

**range (end)**

**range (start, end)**

**range (start, end, step)**

**Python range() function syntax:**

**range(start: stop: step)**

**Start: Optional. An integer number specifying at which position to start. Default is 0**

**Stop: Required. An integer number specifying at which position to end.**

**Step: Optional. An integer number specifying the incrementation. Default is 1**

**Rules for range() function:**

**range() function only works with integers i.e., whole numbers.**

**All argument must be integers.**

**All three arguments can be positive or negative.**

**The step value must not be zero. If a step is zero python raises a ValueError exception.**

**Lesson 1.3**

**Recap for loops in list :**

**Output**

|  |  |
| --- | --- |
| **1** | **list1 = [1,2,3,4,5]** |
| **2** | **for numbers in list1:** |
| **3** | **print(numbers)** |

|  |  |
| --- | --- |
| **1** | **1** |
| **2** | **2** |
| **3** | **3** |
| **4** | **4** |
| **5** | **5** |

**Let’s look at the range function :**

**Output**

|  |  |
| --- | --- |
| **1** | **for numbers in range(5):** |
| **2** | **print(numbers)** |

|  |  |
| --- | --- |
| **1** | **0** |
| **2** | **1** |
| **3** | **2** |
| **4** | **3** |
| **5** | **4** |

**Output**

|  |  |
| --- | --- |
| **1** | **for numbers in range(3,6):** |
| **2** | **print(numbers)** |

|  |  |
| --- | --- |
| **1** | **3** |
| **2** | **4** |
| **3** | **5** |

**Output**

|  |  |
| --- | --- |
| **1** | **for numbers in range(3,8,2):** |
| **2** | **print(numbers)** |

|  |  |
| --- | --- |
| **1** | **3** |
| **2** | **5** |
| **3** | **7** |

**Lesson 1.3**

**Let’s look at the concept of a counter. Counter allows you to count the number of items in a list of range. Note the indentation of print and what you are printing in line 5**

**Output**

|  |  |
| --- | --- |
| **1** | **list1 = [1,2,3,4,5]** |
| **2** | **count=0** |
| **3** | **for numbers in list1:** |
| **4** | **count=count+1** |
| **5** | **print(count)** |

|  |  |
| --- | --- |
| **1** | **5** |

**We can also use the concept of len to count the number of items in a list**

**Output**

|  |  |
| --- | --- |
| **1** | **list1 = [1,2,3,4,5]** |
| **2** | **print(len(list1))** |

|  |  |
| --- | --- |
| **1** | **5** |

**Now, our list is a range. Let’s count the how many numbers are in the range**

**Output**

|  |  |
| --- | --- |
| **1** | **count=0** |
| **2** | **for numbers in range(7):** |
| **3** | **count=count+1** |
| **4** | **print(count)** |

|  |  |
| --- | --- |
| **1** | **7** |

**We counted 7 numbers above. What are the 7 numbers?**

**(Recall the code to print the numbers in a range?)**

**Output**

|  |  |
| --- | --- |
| **1** | **for numbers in range(7):** |
| **2** | **print(numbers)** |

|  |  |
| --- | --- |
| **1** | **0** |
| **2** | **1** |
| **3** | **2** |
| **4** | **3** |
| **5** | **4** |
| **6** | **5** |
| **7** | **6** |

**Lesson 1.3**

Type the following and fill in the output after pressing F5

*\*The numbers represent the lines.*

Task 1: Using for loops, print each number in list3 where list3=[61,17,21,13,16]

Output

|  |  |
| --- | --- |
| 1 |  |
| 2 |  |
| 3 |  |

|  |  |
| --- | --- |
| 1 | 61 |
| 2 | 17 |
| 3 | 21 |
| 4 | 13 |
| 5 | 16 |

Task 2: Using for loops, find the output of list1, where list1 = [1,2,3,4].

Output

|  |  |
| --- | --- |
| 1 |  |
| 2 |  |
| 3 |  |
| 4 |  |
| 5 |  |

|  |  |
| --- | --- |
| 1 |  |
| 2 |  |
| 3 |  |
| 4 |  |

Task 3a: Using for loops, find the number of items in list2 where list2=[6,7,2,3,6,0,1,20,15]

Output

|  |  |
| --- | --- |
| 1 |  |
| 2 |  |
| 3 |  |
| 4 |  |
| 5 |  |
| 6 |  |

|  |  |
| --- | --- |
| 1 |  |

Task 3b: Using the function of len, find the number of items in list2 above

**Lesson 1.3**

For Task 4 to Task 6, use for loops and range(start, stop, step)

Task 4:

Create a sequence of numbers starting from 0, ending at 3 with increment of 1

Output

|  |  |
| --- | --- |
| 1 |  |
| 2 |  |
| 3 |  |

|  |  |
| --- | --- |
| 1 | 0 |
| 2 | 1 |
| 3 | 2 |
| 4 | 3 |

Task 5:

Create a sequence of numbers starting from 3, ending 9, with increment of 2

Output

|  |  |
| --- | --- |
| 1 |  |
| 2 |  |
| 3 |  |

|  |  |
| --- | --- |
| 1 | 3 |
| 2 | 5 |
| 3 | 7 |
| 4 | 9 |

Task 6:

Create a sequence of numbers starting from 4, ending 12, with increment of 4

Output

|  |  |
| --- | --- |
| 1 |  |
| 2 |  |
| 3 |  |

|  |  |
| --- | --- |
| 1 | 4 |
| 2 | 8 |
| 3 | 12 |

**Lesson 1.3**

In Task 7, we will explore a method to print a range of values, with only 1 argument in our range() function.

Task 7a:

Create a sequence of numbers starting from 1, ending at 5 with increment of 1

Output

|  |  |
| --- | --- |
| 1 | a=1 |
| 2 | for numbers in range(5): |
| 3 | print(a + numbers) |

|  |  |
| --- | --- |
| 1 | 1 |
| 2 | 2 |
| 3 | 3 |
| 4 | 4 |
| 5 | 5 |

Task 7b: Recap of loop through range –

Output

|  |  |
| --- | --- |
| 1 | for numbers in range(5): |
| 2 | print(numbers) |

|  |  |
| --- | --- |
| 1 | 0 |
| 2 | 1 |
| 3 | 2 |
| 4 | 3 |
| 5 | 4 |

**Task 7a, 7b: Explain the difference and write your Key take-aways.**

|  |
| --- |
|  |

**Why do you think it is useful to have only 1 argument in the range function?**

|  |
| --- |
|  |

HINT:

Notice that the number of outputs is the same as the argument in the range() function.

**Lesson 1.3**

For Task 8 and 9, use for loops and range(n)

Task 8:

Create a sequence of numbers starting from 10, ending at 5 with decreasing by 1

Output

|  |  |
| --- | --- |
| 1 |  |
| 2 |  |
| 3 |  |

|  |  |
| --- | --- |
| 1 | 10 |
| 2 | 9 |
| 3 | 8 |
| 4 | 7 |
| 5 | 6 |
| 6 | 5 |

Task 9:

Create a sequence of numbers starting from 10, ending at 0 with decreasing by 2

Output

|  |  |
| --- | --- |
| 1 |  |
| 2 |  |
| 3 |  |

|  |  |
| --- | --- |
| 1 | 10 |
| 2 | 8 |
| 3 | 6 |
| 4 | 4 |
| 5 | 2 |
| 6 | 0 |

**Lesson 1.4**

**List Indexing : 1. Index starts from 0 in Python.**

**2. First element has an index 0, second element has index 1, so on.**

**3. Negative Index starts from -1**

**4. To access an element by its index we need to use square brackets**

**Output**

|  |  |
| --- | --- |
| ***1*** | **mylist1= [‘Jacob’, ‘Tom’, ‘Daniel’]** |
| ***2*** | **print(mylist1[0])** |

|  |  |
| --- | --- |
| ***1*** | **Jacob** |

**Output**

|  |  |
| --- | --- |
| ***1*** | **mylist2= [1,8,10,4]** |
| ***2*** | **print(mylist2[2])** |

|  |  |
| --- | --- |
| ***1*** | **10** |

**Output**

|  |  |
| --- | --- |
| ***1*** | **mylist3= [1,8,10,"happy",3,"sad","fat",4]** |
| ***2*** | **print(mylist3[-1])** |

|  |  |
| --- | --- |
| ***1*** | **4** |

|  |
| --- |
|  |

Type the following and fill in the output after pressing F5

*\*The numbers represent the lines.*

Task 1:

Output

|  |  |
| --- | --- |
| *1* | length=[55,87,91,67,83,23] |
| *2* | print(length[5]) |

|  |  |
| --- | --- |
| *1* |  |

Task 2:

Output

|  |  |
| --- | --- |
| *1* | height=[“short”,187,191,183] |
| *2* | print(height[0]) |

|  |  |
| --- | --- |
| *1* |  |

**Lesson 1.4**

Task 3:

Output

|  |  |
| --- | --- |
| *1* | width=[15,17,91,16,”wide”] |
| *2* | print(width[-1]) |

|  |  |
| --- | --- |
| *1* |  |

Task 4:

Output

|  |  |
| --- | --- |
| *1* | name=[‘Jane’, ‘Kate’, ‘Claire’, ‘Jasmine’, ‘Jennifer’, ‘Jenn’] |
| *2* | print(name[1]) |

|  |  |
| --- | --- |
| *1* |  |

Task 5:

Output

|  |  |
| --- | --- |
| *1* | name=[‘Liam’, ‘Noah’, ‘Tyler’, ‘33’, ‘2’, ‘Jake’] |
| *2* | print(name[-3]) |

|  |  |
| --- | --- |
| *1* |  |

Task 6:

Output

|  |  |
| --- | --- |
| *1* | weight=[20,”fat”,80,10,89,71,35] |
| *2* | print(weight[-6]) |

|  |  |
| --- | --- |
| *1* |  |

Task 7:

Output

|  |  |
| --- | --- |
| *1* | index=[‘James’, ‘John’, ‘Daniel’, ‘Jacob’, ‘Johan’, ‘Kenny’] |
| *2* | print(index[-4]) |

|  |  |
| --- | --- |
| *1* |  |

**Lesson 1.5**

**Recap our string slicing in Module 1? Slicing a list is the same.**

**Slice Notation Syntax:**

1. **The full slice syntax is - *start : stop : step*.**
2. **Start refers to the index of the element which is used as a start of our slice.**
3. **Stop refers to the index of the element we should stop just before to finish our slice.**
4. **Step allows you to take each nth-element within a *start : stop* range.**

**Output**

|  |  |
| --- | --- |
| ***1*** | **mylist= [1,2,3,4,5,6,7,8]** |
| ***2*** | **print(mylist[2:7])** |

|  |  |
| --- | --- |
| ***1*** | **[3,4,5,6,7]** |

**Output**

|  |  |
| --- | --- |
| ***1*** | **mylist= [1,2,3,4,5,6,7,8]** |
| ***2*** | **print(mylist[2:-1])** |

|  |  |
| --- | --- |
| ***1*** | **[3,4,5,6,7]** |

|  |
| --- |
|  |

Type the following and fill in the output after pressing F5

*\*The numbers represent the lines.*

Task 1:

Output

|  |  |
| --- | --- |
| *1* | height=[10,50,90,100,70,80,30] |
| *2* | print(height[0:4]) |

|  |  |
| --- | --- |
| *1* |  |

Task 2:

Output

|  |  |
| --- | --- |
| *1* | weight=[20,101,80,10,89,71,35] |
| *2* | print(weight[1:5]) |

|  |  |
| --- | --- |
| *1* |  |

Task 3:

Output

|  |  |
| --- | --- |
| *1* | mylist=[55,87,91,67,83,23] |
| *2* | print(mylist[-5:-1]) |

|  |  |
| --- | --- |
| *1* |  |

**Lesson 1.5**

Task 4:

Output

|  |  |
| --- | --- |
| *1* | num=[155,287,931,637,83,23] |
| *2* | print (num[2:-1]) |

|  |  |
| --- | --- |
| *1* |  |

Task 5:

Output

|  |  |
| --- | --- |
| *1* | size=[15,28,31,63,3,2] |
| *2* | print (size[0:-3]) |

|  |  |
| --- | --- |
| *1* |  |

Task 6:

Output

|  |  |
| --- | --- |
| *1* | score=[99,50, 78,92,26,100] |
| *2* |  |

|  |  |
| --- | --- |
| *1* | [78,92,26] |

**Lesson 1.6**

**To slice values in a range, convert the range to a list**

**Python typecasting range to list syntax:**

**a= list(range())**

**Output**

|  |  |
| --- | --- |
| **1** | **a = list(range (1,5))** |
| **2** | **print(a[2])** |

|  |  |
| --- | --- |
| **1** | **3** |

**Output**

|  |  |
| --- | --- |
| **1** | **a = list(range (1,10))** |
| **2** | **print(a[2:5])** |

|  |  |
| --- | --- |
| **1** | **[3,4,5]** |

|  |
| --- |
|  |

Type the following and fill in the output after pressing F5

*\*The numbers represent the lines.*

Task 1:

Output

|  |  |
| --- | --- |
| 1 | a = list(range (1,20)) |
| 2 | print(a[0:5]) |

|  |  |
| --- | --- |
| 1 |  |

Task 2:

Output

|  |  |
| --- | --- |
| 1 | a = list(range (1,10)) |
| 2 | print(a[-5:-1]) |

|  |  |
| --- | --- |
| 1 |  |

Task 3:

Output

|  |  |
| --- | --- |
| 1 | a = [1,2,3,4,5,6,7,8,9,10] |
| 2 | print(a[-5:-1]) |

|  |  |
| --- | --- |
| 1 |  |

**Task 2, 3: Explain the difference and write your Key take-aways.**

|  |
| --- |
|  |

**Lesson 1.6**

Task 4:

Output

|  |  |
| --- | --- |
| 1 | a = list(range (1,10)) |
| 2 | print(a[2:-4]) |

|  |  |
| --- | --- |
| 1 |  |

Task 5:

Output

|  |  |
| --- | --- |
| 1 | a = list(range (1,10)) |
| 2 | print |

|  |  |
| --- | --- |
| 1 | [5,6] |

Task 6:

Output

|  |  |
| --- | --- |
| 1 | a = list(range (1,12)) |
| 2 | print |

|  |  |
| --- | --- |
| 1 | [6,7,8] |

Task 7: Using for loops, print each number in list1 where list1=list(range(4,20,5))

**Lesson 1.7**

**We have learnt the concept of a counter. A counter allows you to count the number of items in a list of range. What if we would like to find the sum of the numbers in the list or in the range?**

Task 1a: Using for loops, find the result of the sum of numbers in the list a where a = [10, 20, 30, 40, 50]

***Output***

|  |  |
| --- | --- |
| **1** | **num=[10,20,30,40,50]** |
| **2** | **sum=0** |
| **3** | **for numbers in num:** |
| **4** | **sum=sum+numbers** |
| **5** | **print(sum)** |

|  |  |
| --- | --- |
| ***1*** |  |

Task 1b.: Take note of the indentation of print. What happens?

***Output***

|  |  |
| --- | --- |
| **1** | **num=[10,20,30,40,50]** |
| **2** | **sum=0** |
| **3** | **for numbers in num:** |
| **4** | **sum=sum+numbers** |
| **5** | **print(sum)** |

|  |  |
| --- | --- |
| ***1*** |  |
| ***2*** |  |
| ***3*** |  |
| ***4*** |  |
| ***5*** |  |

Task 2:

Using for loops, find the result of the multiplication of numbers in the list b where b = [2, 4, 6, 8, 12]. The answer will be (2 x 4 x 6 x 8 x 12=4608)

***Output***

|  |  |
| --- | --- |
| **1** |  |
| **2** |  |
| **3** |  |
| **4** |  |
| **5** |  |

|  |  |
| --- | --- |
| ***1*** | 4608 |

**Lesson 1.7**

Task 3:

Using for loops and range, find the result of the multiplication of the numbers in the range(1,5). The answer will be ( 1 x 2 x 3 x 4 =24 )

***Output***

|  |  |
| --- | --- |
| **1** |  |
| **2** |  |
| **3** |  |
| **4** |  |
| **5** |  |

|  |  |
| --- | --- |
| ***1*** | 24 |

**Lesson 1.7**

Task 5:

Alfred studies the cell division process of a special type of organism. For every 5 minutes, the organism will increase by 1.

1. Given a starting number of 5 organism, Alfred wants to know how many organisms will be present after each cycle, for a total of 10 cycles (50 minutes). Fill in *column a*

|  |  |
| --- | --- |
| 1 | organism=5 |
| 2 | for number in range(1,51,5): |
| 3 | organism=organism+1 |
| 4 | print(organism) |

Question b:

Fill in this cell.

|  |  |  |  |
| --- | --- | --- | --- |
| Cycle | Time | *(Column a)*  Starting with 5 organisms | Starting with 15 organisms |
| 1 | 5 |  |  |
| 2 | 10 |  |  |
| 3 | 15 |  |  |
| 4 | 20 |  |  |
| 5 | 25 |  |  |
| 6 | 30 |  |  |
| 7 | 35 |  |  |
| 8 | 40 |  |  |
| 9 | 45 |  |  |
| 10 | 50 |  |  |

1. Find the total number of organisms at the end of 10 cycles (50 mins) if the starting number of organisms is 15 *(\*hint: Steps same as above, change in print indentation)*

|  |  |
| --- | --- |
| 1 |  |
| 2 |  |
| 3 |  |
| 4 |  |

**Lesson 1.7**

Task 6:

John has a very rich father who gives him his pocket money daily increasing by $2 each day. On day 1, he gets $2. On day 2, he gets $4. (No functions required)

* 1. Using for loops, print the amount he gets in each day from day 1 to day 5 in the format:

“In day 1, he gets $2”

“In day 2, he gets $4”

“In day 3, he gets $6”

“In day 4, he get $8”

“In day 5, he gets $10”

*Complete lines 1 and 2*

|  |  |
| --- | --- |
| 1 | for i in range ( |
| 2 | eachday= |
| 3 | print( “In day”, i, “he gets”, “$”, eachday) |

* 1. Using for loops, find the total amount he gets from Day 1 to Day 5. Print in the format “He gets total of $\_\_\_ “

*Complete lines 2 and 3*

|  |  |
| --- | --- |
| 1 | Total=0 |
| 2 | for i in range ( |
| 3 | eachday= |
| 4 | Total = Total + eachday |
| 5 | print( “He gets total of”, “$”, “Total) |

**Lesson 1.8**

**To get our multiplication number, we can achieve it via 2 ways. (Using example of 5 times table)**

**Method 1 – multiplying the multiple**

**i \*5**

**Method 2 – adding the multiple to the last**

**ans= ans + 5**

Method 1: Using for loops and range (start, stop, step), create a multiplication table

Task 1a: Create a 3 times table with the output

***Output***

|  |  |
| --- | --- |
| **1** | **for i in range (1,5,1):** |
| **2** | **result = i \* 3** |
| **3** | **print( i, “x”, “3” , “=”, result)** |

|  |  |
| --- | --- |
| 1 | 1 x 3=3 |
| 2 | 2 x 3=6 |
| 3 | 3 x 3=9 |
| 4 | 4 x 3=12 |

Method 1: Using for loops and range (), create a multiplication table

Task 1b: Create a 5 times table with the output

***Output***

|  |  |
| --- | --- |
| 1 |  |
| 2 |  |
| 3 |  |
| 4 |  |

|  |  |
| --- | --- |
| 1 | 1 x 5=5 |
| 2 | 2 x 5=10 |
| 3 | 3 x 5=15 |
| 4 | 4 x 5=20 |
| 5 | 5 x 5=25 |

**Lesson 1.8**

Method 2: Using for loops and range (start, stop, step), create a multiplication table

Task 2a: Create a 3 times table with the output

***Output***

|  |  |
| --- | --- |
| **1** | **Ans = 0** |
| **2** | **for i in range (1,5,1):** |
| **3** | **Ans = Ans + 3** |
| **4** | **print( i, “x”, “3” , “=”, Ans)** |

|  |  |
| --- | --- |
| 1 | 1 x 3 = 3 |
| 2 | 2 x 3 = 6 |
| 3 | 3 x 3 = 9 |
| 4 | 4 x 3 = 12 |

Method 2: Using for loops and range (), create a multiplication table

Task 2b: Create a 5 times table with the output

***Output***

|  |  |
| --- | --- |
| 1 |  |
| 2 |  |
| 3 |  |
| 4 |  |

|  |  |
| --- | --- |
| 1 | 1 x 5=5 |
| 2 | 2 x 5=10 |
| 3 | 3 x 5=15 |
| 4 | 4 x 5=20 |
| 5 | 5 x 5=25 |

**End of Lesson 1 Quiz**

Question 1:

Using For Loops and range(), print the output as shown

*Output*

|  |  |
| --- | --- |
| 1 |  |
| 2 |  |
| 3 |  |
| 4 |  |
| 5 |  |

|  |  |
| --- | --- |
| *1* | *10* |
| *2* | *9* |
| *3* | *8* |
| *4* | *7* |
| *5* | *6* |

Question 2:

Using For Loops and range( start, stop step), create a sequence of numbers as shown.

*Output*

|  |  |
| --- | --- |
| 1 |  |
| 2 |  |
| 3 |  |
| 4 |  |
| 5 |  |

|  |  |
| --- | --- |
| *1* | 1 |
| *2* | 3 |
| *3* | 5 |
| *4* | 7 |
| *5* | 9 |
| *6* | 11 |
| *7* | 13 |

Question 3:

a. Using for loops, find the number of items in list1 where list1=range(10)

Output

|  |  |
| --- | --- |
| 1 | list1 = range (4) |
| 2 |  |
| 3 |  |
| 4 |  |
| 5 |  |
| 6 |  |

|  |  |
| --- | --- |
| 1 |  |

b. Using the function of len, find the number of items in list1 above

**End of Lesson 1 Quiz**

Question 4:

Using For Loops, print the numbers in list4 where list3=[10,56,34,4,7]

Output

|  |  |
| --- | --- |
| 1 |  |
| 2 |  |
| 3 |  |

|  |  |
| --- | --- |
| 1 | 10 |
| 2 | 56 |
| 3 | 34 |
| 4 | 4 |
| 5 | 7 |

Question 5:

Use for loops to create a 10 times table with the output

*Output*

|  |  |
| --- | --- |
| 1 |  |
| 2 |  |
| 3 |  |
| 4 |  |
| 5 |  |
| 6 |  |

|  |  |
| --- | --- |
| 1 | 1 x 10 = 10 |
| 2 | 2 x 10 = 20 |
| 3 | 3 x 10 = 30 |
| 4 | 4 x 10 = 40 |
| 5 | 5 x 10 = 50 |
| 6 | 6 x 10 = 60 |
| 7 | 7 x 10 = 70 |

Question 6:

Using list slicing, print the 5th number in the list called f where f = [1,2,3,4,5,6,7]

Output

|  |  |
| --- | --- |
| *1* |  |
| *2* |  |

|  |  |
| --- | --- |
| *1* |  |

Question 7:

Using list slicing, print the following score numbers from your maths test in the list called score where score = [99,50,78,92,26,100,22]

Output

|  |  |
| --- | --- |
| *1* |  |
| *2* |  |

|  |  |
| --- | --- |
| *1* | [78, 92, 26, 100, 22] |

**End of Lesson 1 Quiz**

Question 8:

Using list slicing, find the output for the following.

Output

|  |  |
| --- | --- |
| *1* | mylist=[55,87,91,67,83,23,100] |
| *2* | print(weight[-5:-1]) |

|  |  |
| --- | --- |
| *1* |  |

Question 9:

Jane has a list of different flavours of sweets named listsweets.

listsweets=[“orange”, “strawberry”, “grape”, “lemon”, “mint”]

* 1. Write a code using for loops to find the number of flavours in the list named listsweets in the format “ There are \_\_\_ flavours in total”
  2. Using len, find the number of flavours in the list named listsweets in the format “ There are \_\_\_ flavours”

Question 10:

James sells a fixed number of 2 toys each day for extra pocket money. He starts off with selling each toy at $5. The selling price of his toy increases by $5 each day. (No functions required)

1. Using for loops, print the amount he collects on each day from day 1 to day 10 in the format:

“In day 1, he collects $10”

“In day 2, he gets $20”

“In day 3, he gets $30”

“In day 4, he get $40”

“In day 5, he gets $50”

.

.

.

.

“In day 10, he collects ”

1. Using for loops, find the total amount he gets from Day 1 to Day 10. Print in the format “He collects total of $\_\_\_ “