**Recap:**

1. Lesson 1 to Lesson 11

**Learning Outcomes:**

1. Practice for Final Exam in Lesson 12.

**Explanation Points:**

* Clear any misconceptions or misunderstanding the student has.

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

**Module 2 Lesson 11**

Difference between *return()* and *print()*

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| --- |
|  |

What is a local variable and where are they found?

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| --- |
|  |

What is a global variable and where are they found?

|  |
| --- |
|  |

Given a = [1, 5, 8, 10, 8, 5, 1], using for loops print the first 4 terms and each terms should be printed in a new Line. Write your code below.

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| --- |
|  |

How to define a function? Write an **example** **code** to define a function

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| --- |
|  |

How to call a function? Write an **example code** to call the function above

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|  |

Difference between a simple loop and a nested loop

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**Module 2 Lesson 11**

What is an AP sequence?

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What is a GP sequence?

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Look at the following list and determine if the list contains a AP or GP sequence?

a = [1, 3 ,5, 7, 9] AP or GP? \_\_\_\_\_\_

b = [2, 4, 8, 16] AP or GP? \_\_\_\_\_\_

c = [102, 122, 142, 162] AP or GP? \_\_\_\_\_\_

d = [9, 16, 25, 36] AP or GP? \_\_\_\_\_\_

e = [-1, 2, -4, 8] AP or GP? \_\_\_\_\_\_

f = [-1, 1, -1, 1] AP or GP? \_\_\_\_\_\_

g= [5, 15, 45] AP or GP? \_\_\_\_\_\_

h = [10, 20, 30, 40, 50] AP or GP? \_\_\_\_\_\_**Module 2 Lesson 11**

Study the 2 different for-loops below and answer the questions.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Nested for-loops   |  |  | | --- | --- | | ***1*** | **counter1 = 11** | | ***2*** | **counter2 = 11** | | *3* | for i in range(3): # LOOP 1 | | *4* | counter1 = counter1 + 1 | | *5* | print(counter1, counter2) | | *6* | for j in range(11): # LOOP 2 | | *7* | counter2 = counter2 + 1 | | *8* | print(counter1, counter2) | | *9* | print(counter1, counter2) | | 2 for-loop   |  |  | | --- | --- | | ***1*** | **counter1 = 11** | | ***2*** | **counter2 = 11** | | *3* | for i in range(3): # LOOP 1 | | *4* | counter1 = counter1 + 1 | | *5* | print(counter1, counter2) | | *6* | for j in range(11): # LOOP 2 | | *7* | counter2 = counter2 + 1 | | *8* | print(counter1, counter2 ) | | *9* | print(counter1, counter2) | |  |

Question

Nested for-loop, how many times Line 7 is executed? \_\_\_\_\_\_

2 for-loop, how many times Line 7 is executed? \_\_\_\_\_\_

Nested for-loop, how many times Loop1 runs? \_\_\_\_\_\_

2 for-loop, how many times Loop2 runs? \_\_\_\_\_\_

Nested for-loop, what is the value of ***counter1*** at the end? \_\_\_\_\_\_

2 for-loop, what is the value of ***counter2*** at the end? \_\_\_\_\_

Table to write in the values of counter1 and counter2

|  |  |
| --- | --- |
| counter1 | counter2 |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
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|  |  |
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**Module 2 Lesson 11**

Study the 2 different for-loops below and answer the questions.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Dynamic Nested for-loops   |  |  | | --- | --- | | ***1*** | **counter1 = 11** | | ***2*** | **counter2 = 11** | | *3* | for i in range(3): # LOOP 1 | | *4* | counter1 = counter1 + 1 | | *5* | print(counter1, counter2, “LOOP1”) | | *6* | for j in range(11): # LOOP 2 | | *7* | counter2 = counter2 - 1 | | *8* | print(counter1, counter2 , “LOOP2”) | | *9* | print(counter1, counter2) | | Static Nested for-loop   |  |  | | --- | --- | | ***1*** | **counter1 = 11** | | ***2*** | **counter2 = 11** | | *3* | for i in range(3): # LOOP 1 | | *4* | counter1 = counter1 + 1 | | *5* | print(counter1, counter2, “LOOP1”) | | *6* | for j in range(i): # LOOP 2 | | *7* | counter2 = counter2 - 1 | | *8* | print(counter1, counter2 , “LOOP2”) | | *9* | print(counter1, counter2) | |  |

Question

Dynamics Nested for-loop, how many times Line 7 is executed? \_\_\_\_\_\_

Static Nested for-loop, how many times Line 7 is executed? \_\_\_\_\_\_

Dynamics Nested for-loop, how many times Loop1 runs? \_\_\_\_\_\_

Static Nested for-loop, how many times Loop2 runs? \_\_\_\_\_\_

Dynamics Nested for-loop, what is the value of ***counter1*** at the end? \_\_\_\_\_\_

Static Nested for-loop, what is the value of ***counter2*** at the end? \_\_\_\_\_\_

Table to write in the values of counter1 and counter2

|  |  |
| --- | --- |
| counter1 | counter2 |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

**Module 2 Lesson 11**

|  |  |
| --- | --- |
| *1* | list = [1, 3, 2, 4] |
| *2* | var = 0 |
| *3* | for num in list: |
| *4* | var += num |
| *5* | print(var) |

What is the output?

|  |  |
| --- | --- |
| *1* | list = [3, 3, 2, 2] |
| *2* | var = -10 |
| *3* | for num in list: |
| *4* | var += num |
| *5* | print(var) |

What is the output?

|  |  |
| --- | --- |
| *1* | list = [2, 3, 1, 4] |
| *2* | var = “” |
| *3* | for num in list: |
| *4* | var += str(num) |
| *5* | print(var) |

What is the output?

|  |  |
| --- | --- |
| *1* | list = [2, 3, 1, 4] |
| *2* | var = [] |
| *3* | for num in list: |
| *4* | var.append(num\*2) |
| *5* | print(var) |

What is the output?

**Module 2 Lesson 11**

|  |  |
| --- | --- |
| *1* | count = 1 |
| *2* | for num in range(5): |
| *3* | count \*= num |
| *4* | print(count) |

What is the output?

|  |  |
| --- | --- |
| *1* | count = 2 |
| *2* | for num in range(5): |
| *3* | count += num |
| *4* | print(count) |

What is the output?

|  |  |
| --- | --- |
| *1* | count = 3 |
| *2* | for num in range(5): |
| *3* | count += num + num |
| *4* | print(count) |

What is the output?

|  |  |
| --- | --- |
| *1* | count = 4 |
| *2* | for num in range(5): |
| *3* | count += num \* num |
| *4* | print(count) |

What is the output?

**Module 2 Lesson 11**

Which of the following represents the correct way of writing a for loop?

for num in 5:

for num range(5):

for num in range(5):

for range(5):

|  |  |
| --- | --- |
| *1* | for num in range(5): |
| *2* | for num2 in range(2): |
| *3* | print(num\*num2) |

How many lines of output?

What is the biggest output?

What is the smallest output?

|  |  |
| --- | --- |
| *1* | for num in range(2): |
| *2* | for num2 in range(5): |
| *3* | print(num\*num2) |

How many lines of output?

What is the biggest output?

What is the smallest output?

**Module 2 Lesson 11**

**Multiplication Table**

Define a function to print the 11 multiplication table base on nth . Call the function to print the 1th to 5th term.

Expected Output

|  |  |
| --- | --- |
| **1** | 11 x 1 = 11 |
| **2** | 11 x 2 = 22 |
| **3** | 11 x 3 = 33 |
| **4** | 11 x 4 = 44 |
| **5** | 11 x 5 = 55 |

**Addition Table**

Define a function to print the 11 addition table base on nth . Call the function to print the 1th to 5th term.

Expected Output

|  |  |
| --- | --- |
| **1** | 11 + 1 = 12 |
| **2** | 11 + 2 = 13 |
| **3** | 11 + 3 = 14 |
| **4** | 11 + 4 = 15 |
| **5** | 11 + 5 = 16 |

**Power Table**

Define a function to print the 2 power table base on nth . Call the function to print the 1th to 5th term.

Expected Output

|  |  |
| --- | --- |
| **1** | 2 \*\* 1 = 2 |
| **2** | 2 \*\* 2 = 4 |
| **3** | 2 \*\* 3 = 8 |
| **4** | 2 \*\* 4 = 16 |
| **5** | 2 \*\* 5 = 32 |

**Module 2 Lesson 11**

Write a code using for loop to print out the following interesting pattern.

1. Using Range()
2. Using List

**Left Align**

|  |
| --- |
| **Expected Output** |
| |  |  | | --- | --- | | **1** | 01111 | | **2** | 00111 | | **3** | 00011 | | **4** | 00001 | | **5** | 00000 | |

**Right Align**

|  |
| --- |
| **Expected Output** |
| |  |  | | --- | --- | | **1** | 11110 | | **2** | 11100 | | **3** | 11000 | | **4** | 10000 | | **5** | 00000 | |

**Centre Align**

|  |
| --- |
| **Expected Output** |
| |  |  | | --- | --- | | **1** | 00100 | | **2** | 01110 | | **3** | 11111 | |

**Module 2 Lesson 11**

Task

George has a bag of 4096 sweets. He decides to give a half of his remaining sweets to every child he meets along the way. Find the number of sweets remaining after John meets 8 kids.

**AP or GP?**

**If AP, what is the a, n, d?**

**If GP, what is the a, n, r?**

**Are you able to write out a table?**

Task

Farmer Joe owns a farm that produces 10 tonnes of a year. Farmer Jack sells to his usual market A at $500 per tonne. He wants to know how much money he would earn from market A at the end of 10 years

**AP or GP?**

**If AP, what is the a, n, d?**

**If GP, what is the a, n, r?**

**Are you able to write out a table?**

Task

Ryan has 15 stickers a day. He gives to his brother a total of 5 stickers each day. He saves the remaining stickers each day. Find the total number of stickers he collects at the end of 5 days.

**AP or GP?**

**If AP, what is the a, n, d?**

**If GP, what is the a, n, r?**

**Are you able to write out a table?**

**Module 2 Lesson 11**

Task

Oliver is studying amoebas and cell division. His culture starts with 5 amoeba multiplies by 2 every cycle. Using for-loops, determine how many amoeba will Oliver have after 10 cycles.

**AP or GP?**

**If AP, what is the a, n, d?**

**If GP, what is the a, n, r?**

**Are you able to write out a table?**

Task

Robert is deciding between 2 bank accounts to save $100 of his money.

Bank A: 2.0% interest compounded annually (Once a year)

Bank B: $20 added quarterly (Once a year)

Using for loops calculate the total amount of money Robert has after 10 years to decide which bank should Robert deposit his money with.

**For Both Bank A and Bank B, use the same guiding questions**

**AP or GP?**

**If AP, what is the a, n, d?**

**If GP, what is the a, n, r?**

**Are you able to write out a table?**

**Module 2 Lesson 11**

Task

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  | | --- | --- | | ***1*** | **counter1 = 5** | | ***2*** | **counter2 = 2** | | *3* | for i in range(5): # LOOP 1 | | *4* | counter1 = counter1 + 1 | | *5* | print(counter1, counter2) | | *6* | for j in range(2): # LOOP 2 | | *7* | counter2 = counter2 + 1 | | *8* | print(counter1, counter2) | | *9* | print(counter1, counter2) | |  |

Is this a nested for-loop? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

How many time Line 8 is executed? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Which Line does ***counter2*** get updated? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

What is the final value of ***counter2*** at the end? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Task

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  | | --- | --- | | ***1*** | **counter1 = 5** | | ***2*** | **counter2 = 2** | | *3* | for i in range(5): # LOOP 1 | | *4* | counter1 = counter1 + 1 | | *5* | print(counter1, counter2) | | *6* | for j in range(i): # LOOP 2 | | *7* | counter2 = counter2 + 1 | | *8* | print(counter1, counter2) | | *9* | print(counter1, counter2) | |  |

Is this a nested for-loop? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

How many time Line 8 is executed? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Which Line does ***counter2*** get updated? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

What is the final value of ***counter2*** at the end? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_