**Recap:**

1. Lesson 1 to Lesson 9

**Learning Outcomes:**

1. Practice Questions

**Explanation Points:**

* Recap For Loops

**Breakdown of Lesson Plan:**

|  |  |
| --- | --- |
| Lesson 9 Recap | 30 min |
| Lesson 10.1 | 40 min |
| Lesson 10.2 | 20 min |

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

**Lesson 9 Recap**

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

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| Nested for-loops   |  |  | | --- | --- | | ***1*** | **counter1 = 10** | | ***2*** | **counter2 = 10** | | *3* | for i in range(3): # LOOP 1 | | *4* | counter1 = counter1 + 1 | | *5* | print(counter1, counter2, “LOOP1”) | | *6* | for j in range(3): # LOOP 2 | | *7* | counter2 = counter2 + 1 | | *8* | print(counter1, counter2 , “LOOP2”) | | *9* | print(counter1, counter2) | | 2 for-loop   |  |  | | --- | --- | | ***1*** | **counter1 = 10** | | ***2*** | **counter2 = 10** | | *3* | for i in range(3): # LOOP 1 | | *4* | counter1 = counter1 + 1 | | *5* | print(counter1, counter2, “LOOP1”) | | *6* | for j in range(3): # LOOP 2 | | *7* | counter2 = counter2 + 1 | | *8* | print(counter1, counter2 , “LOOP2”) | | *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? \_\_\_\_\_

|  |  |
| --- | --- |
| counter1 | counter2 |
|  |  |
|  |  |
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|  |  |
|  |  |
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**Lesson 9 Recap**

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

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| Dynamic Nested for-loops   |  |  | | --- | --- | | ***1*** | **counter1 = 10** | | ***2*** | **counter2 = 10** | | *3* | for i in range(3): # LOOP 1 | | *4* | counter1 = counter1 + 1 | | *5* | print(counter1, counter2, “LOOP1”) | | *6* | for j in range(3): # LOOP 2 | | *7* | counter2 = counter2 - 1 | | *8* | print(counter1, counter2 , “LOOP2”) | | *9* | print(counter1, counter2) | | Static Nested for-loop   |  |  | | --- | --- | | ***1*** | **counter1 = 10** | | ***2*** | **counter2 = 10** | | *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? \_\_\_\_\_\_

|  |  |
| --- | --- |
| counter1 | counter2 |
|  |  |
|  |  |
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**Lesson 10.1**

Task 1:

James is currently 10 years old. He has 100 dollars today in VerySafe bank **that earns 5% interest per annum.** Use for loops to calculate and print James' bank balance every year for the next 6 years.

What is the question asking for?

|  |
| --- |
|  |

Underline or highlight the key words that is required to solve the question. Write them down below.

|  |
| --- |
|  |

Is this an AP or GP?

|  |
| --- |
|  |

If AP, what is the a, d, n? If GP, what is the a, r, n?

|  |
| --- |
|  |

Do we need to use nested for-loops?

|  |
| --- |
|  |

Write a function, *verySafe(),* that contains the for-loop with a parameter, n that represents the number of years. Call the function using ***verySafe(6)*** to give the expected output. Use int() to remove floats.

Expected output:

|  |  |
| --- | --- |
| *1* | year 1 = $105 |
| *2* | year 2 = $110 |
| *3* | year 3 = $115 |
| *4* | year 4 = $121 |
| *5* | year 5 = $127 |
| *6* | year 6 = $134 |

**Lesson 10.1**

Task 2:

John is currently 10 years old. He has 100 dollars today and saves an **additional 20 dollars** each year. Use for loops to calculate and print John's bank balance every year for the next 6 years.

What is the question asking for?

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| --- |
|  |

Underline or highlight the key words that is required to solve the question. Write them down below.

|  |
| --- |
|  |

Is this an AP or GP?

|  |
| --- |
|  |

If AP, what is the a, d, n? If GP, what is the a, r, n?

|  |
| --- |
|  |

Do we need to use nested for-loops?

|  |
| --- |
|  |

Write a function, *bank(),* that contains the for-loop with a parameter, n that represents the number of years. Call the function using ***bank*(6)** to give the expected output. Use int() to remove floats.

Expected output:

|  |  |
| --- | --- |
| *1* | year 1 = $120 |
| *2* | year 2 = $140 |
| *3* | year 3 = $160 |
| *4* | year 4 = $180 |
| *5* | year 5 = $200 |
| *6* | year 6 = $220 |

**Lesson 10.1**

Task 3:

Janis has a whole pizza on the first day she eats 1/4 of the pizza and saves the rest for the next day. On the second day she eats 1/4 of what she saved the first day.

Use for loops to calculate and print the amount of pizza left after 3 days. Should be a float.

What is the question asking for?

|  |
| --- |
|  |

Underline or highlight the key words that is required to solve the question. Write them down below.

|  |
| --- |
|  |

Is this an AP or GP?

|  |
| --- |
|  |

If AP, what is the a, d, n? If GP, what is the a, r, n?

|  |
| --- |
|  |

Do we need to use nested for-loops?

|  |
| --- |
|  |

Write a function, *pizza(),* that contains the for-loop with a parameter, n that represents the number of years. Call the function using ***pizza(3)*** to give the expected output.

Expected output:

|  |  |
| --- | --- |
| *1* | day 1 = 0.25 |
| *2* | day 2 = 0.5625 |
| *3* | day 3 = 0.421875 |

**Lesson 10.1**

Task 4:

Jaymie is deciding between 3 bank accounts to save $100 of her money.

Bank A: 1.0% interest compounded annually (Once a year)

Bank B: 0.9% interest compounded semi-anually (Half a year)

Bank C: $20 added quarterly (Quarter of a year)

Using for loops calculate the total amount of money Jaymie has after 20 years to decide which bank should Jamie deposit her money with.

What is the question asking for?

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| --- |
|  |

Underline or highlight the key words that is required to solve the question. Write them down below.

|  |
| --- |
|  |

Working Space

|  |
| --- |
|  |

If Jaymie selects a bank base on the highest total amount of money at the end of 20 years, Jaymie should selected which Bank? Write you answer below after writing the code.

|  |
| --- |
|  |

**Lesson 10.1**

Task 5:

John aged 9 is currently 125cm tall. He estimates that he will grow 30% in the first year with the growth rate halving each year.

| Year | Growth Rate |
| --- | --- |
| 1 | 30% |
| 2 | 30.00% / 2 = 15.00% |
| 3 | 15.00% / 2 = 7.50% |
| 4 | 7.50% / 2 = 3.75% |

**DO NOT use a function** in this question. Using only for loops calculate and print a list of his estimated height over the next 10 years

What is the question asking for?

|  |
| --- |
|  |

Underline or highlight the key words that is required to solve the question. Write them down below.

|  |
| --- |
|  |

Is this an AP or GP?

|  |
| --- |
|  |

If AP, what is the a, d, n? If GP, what is the a, r, n?

|  |
| --- |
|  |

Do we need to use nested for-loops?

|  |
| --- |
|  |

**Lesson 10.1**

Task 6:

Maya has 3 type of fruits in the fridge. She wants to find out the total weight of all the fruits but is only given 3 different lists as shown below.

fruit = [“Apple”, “Pear”, “Orange”]

quantity = [6, 8, 2]

weight = [10, 20, 30]

**You are not allowed to use ‘\*’ in your code.** Using for-loops and functions, loop through all the list and calculate the total weight of all fruits.

Expected output:

|  |  |
| --- | --- |
| *1* | The total weight of all the fruits is 280. |

What is the question asking for?

|  |
| --- |
|  |

Underline or highlight the key words that is required to solve the question. Write them down below.

|  |
| --- |
|  |

Mathematically how should I get my answer? Write your working below.

|  |
| --- |
|  |

**Lesson 10.2**

Question 1:

|  |  |
| --- | --- |
| *1* | def funct(): |
| *2* | for num in range(5): |
| *3* | for num2 in range(5): |
| *4* | print(str(num)+str(num2)) |
| *5* |  |
| *6* | funct() |

How many outputs do we expect?

A: 20 B: 25

C: 30 D: 35

Guiding Questions:

Which Line is the function ***funct()*** created? \_\_\_\_\_\_\_\_\_

Which Line is the function ***funct()*** called? \_\_\_\_\_\_\_\_\_\_

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

Fill up the table below.

|  |  |  |
| --- | --- | --- |
| num | num2 | val |
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|  |  |  |
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|  |  |  |
|  |  |  |

**Lesson 10.2**

Question 2:

|  |  |
| --- | --- |
| *1* | def funct(): |
| *2* | for num in range(4): |
| *3* | for num2 in range(4): |
| *4* | val = num \* num2 |
| *5* | print(val) |
| *6* | funct() |

How many different values of val will there be?

A: 4 B: 7

C: 9 D: 8

Guiding Questions:

Which Line is the function ***funct()*** created? \_\_\_\_\_\_\_\_\_

Which Line is the function ***funct()*** called? \_\_\_\_\_\_\_\_\_\_

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

Fill up the table below.

|  |  |  |
| --- | --- | --- |
| num | num2 | val |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

**Lesson 10.2**

Question 3:

|  |  |
| --- | --- |
| *1* | def funct(): |
| *2* | for num in range(5): # Loop 1 |
| *3* | for num2 in range(5): # Loop 2 |
| *4* | val = num \* num2 |
| *5* | print(val) |
| *6* | funct() |

How many outputs do we expect?

A: 4 B: 7

C: 5 D: 8

Guiding Questions:

Which Line is the function ***funct()*** created? \_\_\_\_\_\_\_\_\_

Which Line is the function ***funct()*** called? \_\_\_\_\_\_\_\_\_\_

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

If so, is this a **dynamic** nested loop? Or is this a **static** nested loop? \_\_\_\_\_\_\_

Looking at the indentation, which loop does the ***print(val)*** belong to? \_\_\_\_\_\_\_\_\_

Does the equation in Line 4 affects the number of times ***print(val)*** is executed? \_\_\_\_

**Lesson 10.2**

Question 4:

|  |  |
| --- | --- |
| *1* | def funct(): |
| *2* | for num in range(10): |
| *3* | for num2 in range(num): |
| *4* | val = num \* num2 |
| *5* | print(val) |
| *6* | funct() |

What is the largest value of num2?

A: 0 B: 8

C: 9 D: 10

Guiding Questions:

Which Line is the function **funct()** created? \_\_\_\_\_\_\_\_\_

Which Line is the function ***funct()*** called? \_\_\_\_\_\_\_\_\_\_

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

If so, is this a **dynamic** nested loop? Or is this a **static** nested loop? \_\_\_\_\_\_\_

Fill up the table below.

|  |  |  |
| --- | --- | --- |
| num | num2 | val |
|  |  |  |
|  |  |  |
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**Lesson 10.2**

Question 5:

|  |  |
| --- | --- |
| *1* | def funct(): |
| *2* | for num in range(5): |
| *3* | total = 0 |
| *4* | for num2 in range(5): |
| *5* | total += (num2-num) |
| *6* |  |
| *7* | funct() |

What is the largest value of total?

A: 16 B: 12

C: 30 D: 4

Guiding Question:

Which Line is the value of total being changed? \_\_\_\_\_\_\_\_\_\_

Fill up the table below.

|  |  |  |
| --- | --- | --- |
| num | num2 | total |
|  |  |  |
|  |  |  |
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|  |  |  |
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|  |  |  |
|  |  |  |