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DSC510 1.3 Assignment: Programming Concepts

(A) Simple calculations

A.1. Add two integers together

```
In [1]: 2+2
```

```
Out[1]: 4
```

A.2. Show how parenthesis changes the order of operations when using multiplication and addition together.

```
In [2]: x = 5 * 3 + 2  
y = 5 * (3 + 2)  
print("x = " + str(x))  
print("y = " + str(y))
```

```
x = 17  
y = 25
```

A.3. Show how to square and cube numbers.

```
In [3]: squared = 5 ** 2  
cubed = 5 ** 3  
print("squared = " + str(squared))  
print("cubed = " + str(cubed))
```

```
squared = 25  
cubed = 125
```

A.4. Assign numbers to variables and then perform mathematical operations (e.g., add, subtract, multiply) using the variables.

```
In [4]: var1 = 50
        var2 = 20

        varAdd = var1 + var2
        varSub = var1 - var2
        varMul = var1 * var2
        varDiv_Float = var1 / var2
        varDiv_Floor = var1 // var2
        print("varAdd = " + str(varAdd))
        print("varSub = " + str(varSub))
        print("varMul = " + str(varMul))
        print("varDiv_Float = " + str(varDiv_Float))
        print("varDiv_Floor = " + str(varDiv_Floor))

        varAdd = 70
        varSub = 30
        varMul = 1000
        varDiv_Float = 2.5
        varDiv_Floor = 2
```

A.5. Set the variable pi = 3.14159265 and then round it to two decimal places.

```
In [5]: pi = 3.14159265
        round(pi,2)
```

Out[5]: 3.14

A.6. See what happens when you try to divide a number by 0.

```
In [6]: 3/0
        # This causes a ZeroDivisionError
```

```
-----
--
ZeroDivisionError                                Traceback (most recent call las
t)
<ipython-input-6-b999702388f2> in <module>()
----> 1 3/0
      2 # This causes a ZeroDivisionError

ZeroDivisionError: division by zero
```

A.7. Add an integer and a floating point number. Is the result a floating point number or an integer?

```
In [7]: varInteger = 10
        varFloating = 20.3456789
        varInteger + varFloating
        #The result is a floating point number.
```

Out[7]: 30.3456789

A.8. Compute the remainder of an odd number when divided by 2.

```
In [8]: remainder = 17 % 2  
remainder
```

```
Out[8]: 1
```

(B) Working with strings

B.1. Enter Hello World! as a string

```
In [9]: print("Hello World!")  
  
Hello World!
```

B.2. Assign your first name to the variable `first_name` and your last name to the variable `last_name`.

```
In [10]: first_name = "Jonathan"  
last_name = "Lawrence"
```

B.3. Calculate the number of characters in your first name.

```
In [11]: len(first_name)
```

```
Out[11]: 8
```

B.4. Using string indexing, get the first letter of your first name.

```
In [12]: first_name[0]
```

```
Out[12]: 'J'
```

B.5. Using string indexing, get the last letter in your last name.

```
In [13]: last_name[-1]
```

```
Out[13]: 'e'
```

B.6. See what happens when you add `first_name` and `last_name`.

```
In [14]: first_name + last_name
```

```
Out[14]: 'JonathanLawrence'
```

B.7. See what happens when you multiply your `first_name` by an integer between 1 and 5.

```
In [15]: first_name * 4
```

```
Out[15]: 'JonathanJonathanJonathanJonathan'
```

(C) Working with lists

C.1. Create a list of numbers from 1 to 5 and assign it to the variable L.

```
In [16]: L = [1,2,3,4,5]
```

C.2. Using list indexing, select the second item in the list.

```
In [17]: L[1]
```

```
Out[17]: 2
```

C.3. Using slices, get a list containing only the 2nd, 3rd, and 4th numbers.

```
In [18]: L[1:4]
```

```
Out[18]: [2, 3, 4]
```

C.4. Append a 6 to the end of the list.

```
In [19]: L.append(6)  
L
```

```
Out[19]: [1, 2, 3, 4, 5, 6]
```

C.5. Using slices, replace the numbers 2 and 3 with 8 and 9.

```
In [20]: L[1:3] = [8,9]  
L
```

```
Out[20]: [1, 8, 9, 4, 5, 6]
```