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Course name - IT FDN 110 B Au 22: Foundations Of Programming: Python
Assignment 06

Introduction

This module is an introduction to the concept of functions. How can we use functions to allow abstraction, re-usability and make the code more modular and concise. It covers the function parameters, arguments(positional and named arguments), define the scope of variables(global and local variables). Finally at the end we covered about classes and how to implement object-oriented programming in Python.

Topics

1. LAB06_A : Working with Functions

```
Enter the first number: 2
Enter the second number: 5
The results are:

Sum of the two numbers:  7
Difference of the two numbers:  -3
Product of the two numbers:  10
Quotuent of the two numbers:  0.4
```

This script is an example of how to use functions for the operations and return the values. We have defined a couple of functions : getSum() to add the two user input's numbers and return the sum. getDiff() to return the difference of the two user input's numbers. getProd() to return the product of the two user input's numbers and getQuo() to return the quotient of two user input's numbers. For the last function getQuo(), we would need to handle and edge case if the second number is zero, then return 0 to avoid the dividebyzero error. Afterwards we are displaying the results on the console.

2. LAB06_B : Returning Tuples

```
Enter the first number: 2
Enter the second number: 5
The results are:
Sum of the numbers:  7
Difference of the numbers:  -3
Product of the numbers:  10
Quotient of the numbers:  0.4

In [8]:
```

```python
#-----------------------------------------#
# Title: LAB06_B.py
# Desc: Script to perform the basic mathematical operations using user-defined functions.
# Change Log: (Who, When, What)
# Harshita Singh, 2022-Nov-16, Created File
#-----------------------------------------#

def mathOperations():
    sum_of_numbers = num1 + num2
    diff_of_numbers = num1 - num2
    prod_of_numbers = num1 * num2
    if num2 == 0:
        quo_of_numbers = 0
    else:
        quo_of_numbers = num1 / num2

    return sum_of_numbers, diff_of_numbers, prod_of_numbers, quo_of_numbers


if __name__ == "__main__":

    # Ask the numbers from user
    num1 = int(input("Enter the first number: "))
    num2 = int(input("Enter the second number: "))

    # Display the results
    sum_of_numbers, diff_of_numbers, prod_of_numbers, quo_of_numbers = mathOperations()
    print("The results are: ")
    print("Sum of the numbers: ", sum_of_numbers)
    print("Difference of the numbers: ", diff_of_numbers)
    print("Product of the numbers: ", prod_of_numbers)
    print("Quotient of the numbers: ", quo_of_numbers)
```

This script is an example of how to use functions for the operations and return the values. We have defined a single function to add the two user input's numbers, difference of the two user input's numbers, the product of the two user input's numbers and the quotient of two user input's numbers. we would need to handle and edge case if the second number is zero, then return 0 to avoid the dividebyzero error. Afterwards we are returning these results in the form of tuples which new then unpacked in the main() functions to assign values to 4 different variables.

3. LAB06_C

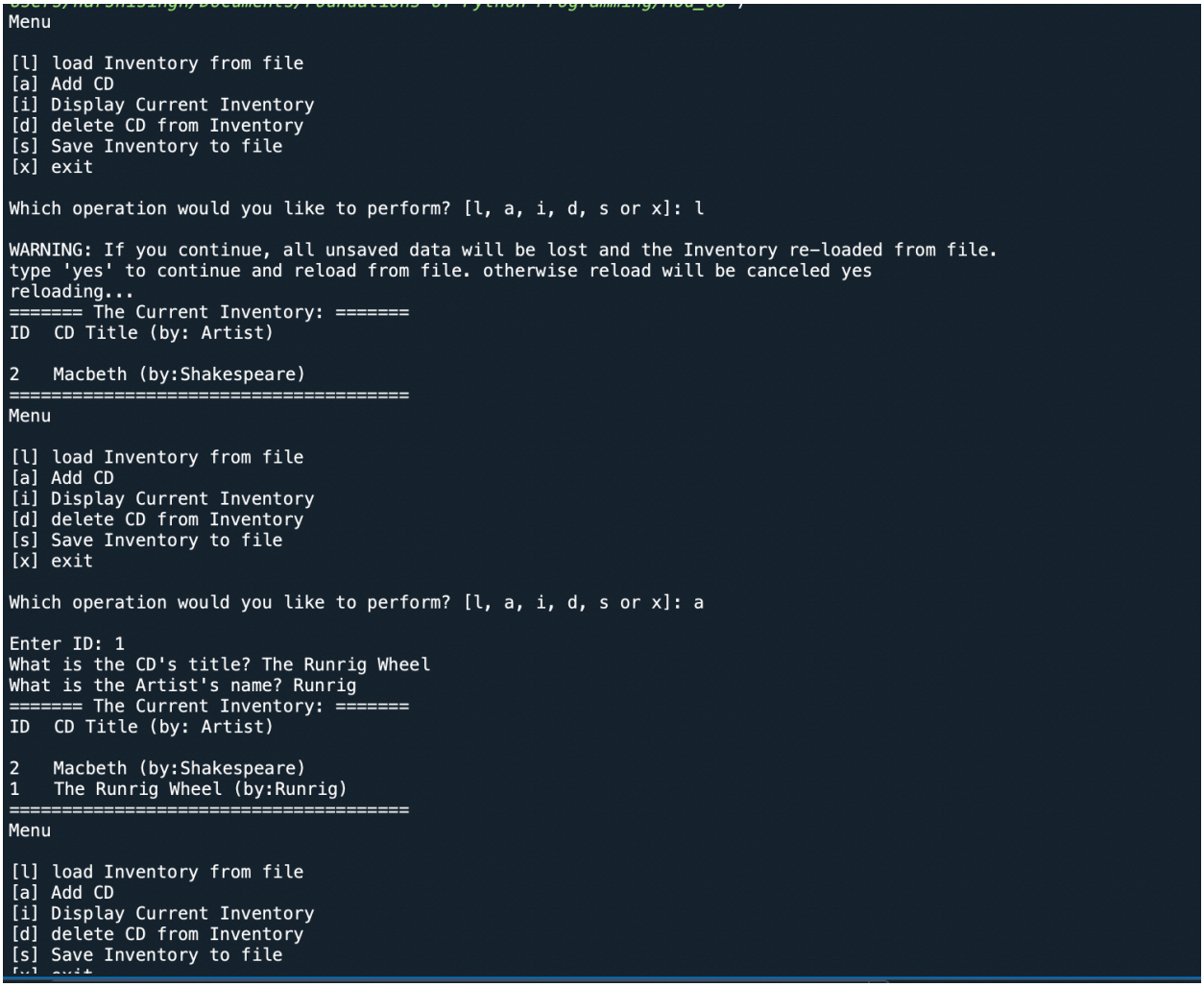
```
Basic Math Script. Calculating the Sum, Difference, Product and Quotient of two Numbers.

Please enter the 1st number: 2
Please enter the 2nd number: 2
The script calculated using the Numbers 2 and 2

The Results are:
Sum:              4.0
Difference:       4.0
Product:          4.0
Quotient:         1.0
```

This script is an example of how to use classes and static methods for the basic math operations and return the values. We have defined a couple of functions : get_sum() to add the two user input's numbers and return the sum. get_diff() to return the difference of the two user input's numbers. get_prod() to return the product of the two user input's numbers and get_quo() to return the quotient of two user input's numbers. For the last function get_quo(), we would need to handle and edge case if the second number is

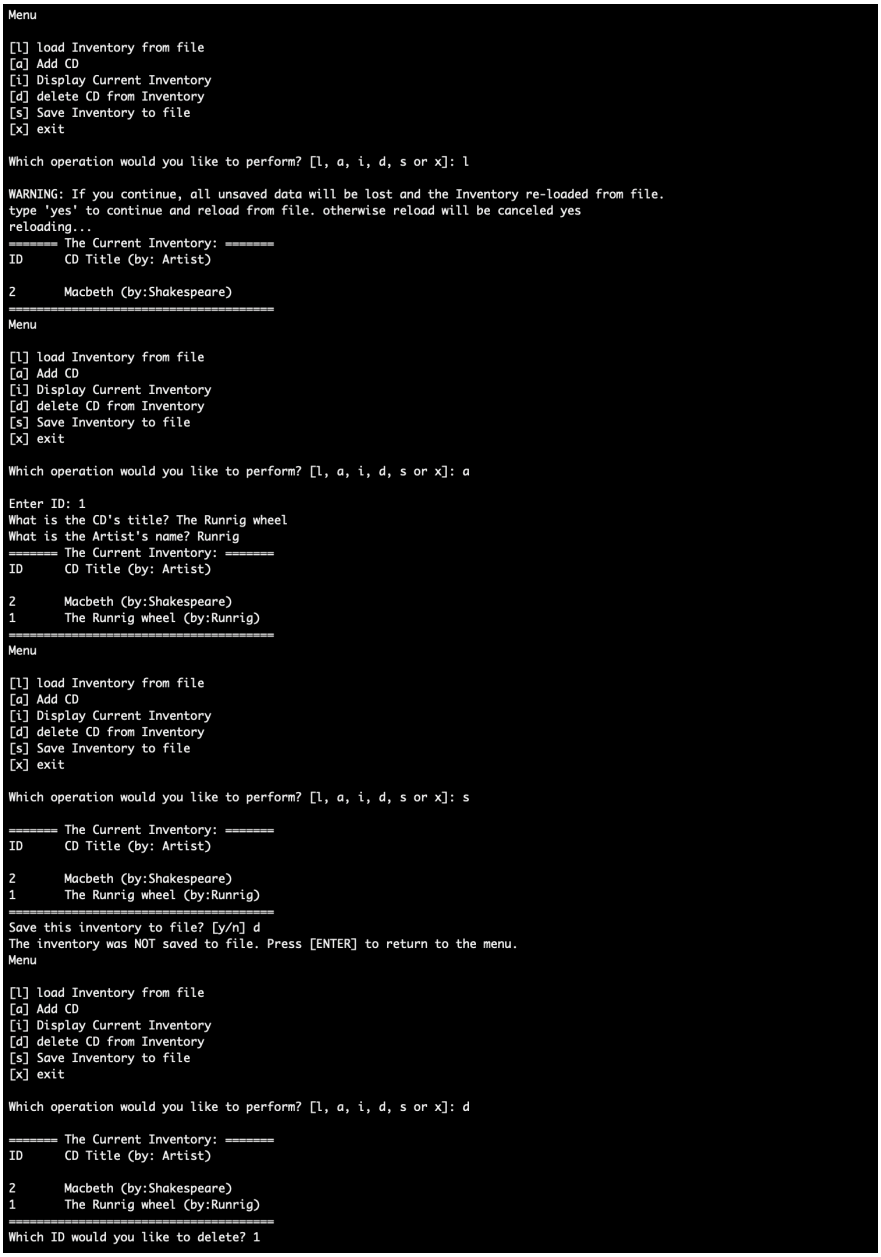
zero, then return 0 to avoid the dividebyzero error. Afterwards we are displaying the results on the console in the expected way.

4. Assignment

Spyder output



Terminal Output



In this exercise we are working with a user menu that includes 6 options as described in the screenshot above.

If the user enters ‘l’, we load the existing data from file into the list of dicts. We are basically initializing our list of dicts from the inventory data in the file.
If the user enters ‘a’, the user is asked to enter values for ID, CD Title and Artist Name. Then we append these values first by storing in a dict and then to the list of dicts.
If the user enters ‘i’, we display the current data from the inventory file to the user.

If the user enters ‘d’, the user is given a prompt to enter a key value/ CD ID that he/she wants to delete. Then we iterate over the list of dicts, look for the key that matches with the user input. If there is a match, we store the position of that row and then delete it from the list. An important thing to note here is that file will still contain the corresponding row until the user enters ’s’ to save the data. This is done in order to avoid any data loss if user removed it by mistake.
If the user enters ’s’, this means we are saving the data/inventory to the file.
If the user enters ‘x’, this means he is exiting from the program and comes out of the loop.

We are extending what we have learnt in the previous assignment by embedding these file processing and data processing steps into separate functions with the help of some classes.

Summary

We covered the concept of functions, arguments, classes and docstrings.

```
Choose from the following options in the Menu:
1 = Add CD
2 = Display Current Inventory
3 = Save Inventory to file
4 = Exit
Enter an input: 1
Enter an id: 3
Enter the CD Title: Bad
Enter the Artist Name: Michael Jackson
===========================
Choose from the following options in the Menu:
1 = Add CD
2 = Display Current Inventory
3 = Save Inventory to file
4 = Exit
Enter an input: 2
 ID  | CD Title           | Artist Name        |

 1   | The Big Wheel      | Runrig             |

 3   | Bad                | Michael Jackson    |
===========================
Choose from the following options in the Menu:
1 = Add CD
2 = Display Current Inventory
3 = Save Inventory to file
4 = Exit
Enter an input: 3
Writing contents to the file
===========================
Choose from the following options in the Menu:
1 = Add CD
2 = Display Current Inventory
3 = Save Inventory to file
4 = Exit
Enter an input: 4
```