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Test-Driven Development

Introduction

The purpose of this practical is to continue using Python to develop programs, using Object-Oriented Programming concepts. Don't forget that you are required to submit the indicated exercise through myLearn for assessment.

Test-Driven Development (TDD)

The idea of TDD is that you first create tests that specify what your program should do, then implement the code to make those tests pass. In class this week, we developed a program from scratch using TDD principles. Good testing gives you excellent assurance that your code is working correctly (provided your tests cover everything you need your program to do) and allows you to modify parts of your code without worrying that you are stopping another part of your code from working - as long as the tests still pass, your code should be working correctly.

Exercises

Use material from this week's lectures to perform the following exercises:

1. **[This exercise should be submitted through the Assessments section of MyLearn for Tutorial Exercise 10]** An online store requires a Python function to calculate the price of orders. The function should be called *calculate_price* and take the following two arguments (in order):
    - *price*: A dictionary mapping the name of each item sold by the store to the price of the item (in dollars)
    - *order*: A dictionary mapping the name of each item a customer wishes to buy to the quantity of that item they wish to purchase

    The function should iterate over each item in the order and add the price to buy the desired quantity of that item to the total cost of the order. If any item in the order does not have a corresponding price, your function should raise a *KeyError*.

    Once the cost of each item in the order has been calculated, the function should test to see if the overall cost for all items is greater than $100. If it is, a 10% discount should be applied to the overall cost. Otherwise, if the order is greater than $50, a 5% discount should be applied.

    The overall cost of the order (after any applicable discounts) should then be returned by the function.

    Write a function to meet these requirements.
2. Ensure you have completed all exercises from previous practicals. If anything is unclear, use the discussion forums!
3. Complete the program developed in lectures. Note: This is the tic-tac-toe/noughts and crosses code (which should be available through myLearn)

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