CSE 1321L: Programming and Problem Solving I Lab

Fall 2025

Assignment 4

Module 3

What students will learn

- Structure program to include methods.
- Understand method parameter and metho call arguments.
- Understand methods that return value

Content

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Overview

For this assignment, you are going to practice implementing functions/methods in your solution. Some of the key concepts you will have to learn and understand are the scope of variables, parameters and arguments, the return statement, and function calls.

Final note: ***Do not cheat***
If your temptation is to look online, don't. Come see us instead and ask questions – we are here to help. Remember, you are going to have to write code in your future job interviews, so learn it now to secure a high-paying job later.

Lastly, make sure you review the sample output and make sure the output of your program follows the exact same format including the input statements, print statement, etc. As always, user input is shown in **red** and **bold**.

Assignment4A: Pascal Case Conversion

Write a Python program that converts a given text into **Pascal Case** by implementing two functions:
format_word(word) – This function should take a single word as input, capitalize its first letter, and convert the rest of the letters to lowercase.Finally this function will return the converted/formatted word.
convert_to_pascal_case(text) – This function should iterate through the entire string. When it encounters a space character, it should treat the collected word as complete and call another function to convert that word to Pascal Case. Once the full string is processed, it should return the final Pascal Case string.

Requirements

- Write main function to take user input as text and in this main function you will be just calling another function i.e. convert_to_pascal and will display the returned cases in main function.
- The program should handle multiple spaces between words.
- The final output should not contain any space.
- You are not allowed to use arrays/lists.
- You can use str.capitalize() to convert first letter to capital.

Example runs are shown below. The user input is shown in **red**

Sample Output #1

```
Enter a string: this is pascal case
Pascal Case: ThisIsPascalCase
```

Sample Output #2

```
Enter a string: convert this to pascal case
Pascal Case: ConvertThisToPascalCase
```

Sample Output #3

```
Enter a string: first letter of each word is captital
Pascal Case: FirstLetterOfEachWordIsCaptital
```

Sample Output #4

```
Enter a string: FiRST letter OF Each WORD IS CAPITAL
Pascal Case: FirstLetterOfEachWordIsCapital
```

Assignment 4B: Coffee Shop

You have been asked by a local coffee shop to develop a point-of-sale terminal for them. The program is simple; it starts by displaying all the items that the coffee shop sells which the user will be able to select and check out.

Owl About Coffee sells these items:

- Espresso $3.00
- Latte $4.00
- Cappuccino $4.00
- Tea $2.00

Requirements

- Your solution must implement the following functions:
    - **printMenu():** This function does not take any parameters and does not return any value. The function should just print all the menu items and the option for the user to exit and checkout.
    - **getChoice():** This function does not take any parameters but does return a value. The function should start by getting a user input (the user's choice) and check if the value input is valid (only integers from 1 to 5). If the input value is valid, it should return an integer value equivalent to the user selection. Else, it should return -1.
    - **processOrder():** This function takes one parameter which will be the user selection. This parameter will be an integer, and its value will range from 1 to 4. Moreover, based on the selection, the function should ask the user how many of the selected items they want to order then print the user's order. Based on the choice and the amount the user input, calculate the corresponding price value and return it.
    - **getTotal():** This function takes one parameter which will represent the subtotal value of what the user will pay. The function should check if the passed parameter contains a value greater than 0, if so, calculate the tax (6%) and the total and print them. If not, the function should do nothing.
- The main program should start by initializing a variable to track the subtotal.
- Start a loop where the program uses the functions defined above to print the menu, get the users choice, and print the total once the user decides to exit and checkout.
- The loop should also evaluate the choice. If **getChoice()** return **-1**, print an error message (the user made the wrong selection). Otherwise, it should start processing the order by calling the appropriate function.

Sample Output #1

```
[Owl About Coffee]
1. Espresso     - $3.00
2. Latte        - $4.00
3. Cappuccino   - $4.00
4. Tea          - $2.00
5. Exit and Checkout
> 3
```

```
How many Cappuccino(s) would you like? 4
Added 4 Cappuccino(s) - $16.00

1. Espresso     - $3.00
2. Latte        - $4.00
3. Cappuccino   - $4.00
4. Tea          - $2.00
5. Exit and Checkout
> 8

Invalid choice, please select one of options displayed.

1. Espresso     - $3.00
2. Latte        - $4.00
3. Cappuccino   - $4.00
4. Tea          - $2.00
5. Exit and Checkout
> 1

How many Expresso(s) would you like? 1
Added 1 Espresso(s) - $3.00

1. Espresso     - $3.00
2. Latte        - $4.00
3. Cappuccino   - $4.00
4. Tea          - $2.00
5. Exit and Checkout
> 5

Subtotal: $19.00
Tax (6%): $1.14
Total: $20.14
[Program Terminated]
```

Assignment4C: Caesar Cipher

One of the simplest methods to encrypt a message is to “shift” the letters by a literal value. For example, if we take the letter ‘A’ and shift it by 2, we get ‘C’. This “substitution cipher” gets its name from the Roman emperor Julius Caesar, who was one of the first person known to encode secret messages this way.

For this assignment, you will create a program that prompts the user for a message to encode, as well as an offset to encrypt it with.

Requirements

- Your solution must implement the following functions:
  - **validate()**: This function takes in the message (as a string) and the offset integer entered by the user. The method should return “true” if the offset is between 0 and 26 inclusively and the message contains only letters and spaces. If it fails either criteria, it should return “false”.
  - **encrypt()**: This function also takes in the message (as a string) and the offset integer entered by the user. It should convert the message to UPPERCASE, encrypt every letter in the message, and leave the spaces as they were. It should then return the encrypted message.
- In your main program, start a loop where the user will be able to input a message and an offset.
- Call the functions defined above to validate and encrypt the user message.
- If the message fails the validation, output the corresponding error message.
- Use the return value of the **encrypt()** function call.
- Prompt the user if they want to encrypt another message.

Hint

- The ord() function will give us the ASCII integer value of a particular letter, and the chr() function will convert a number to a string. How could we use these functions in this assignment?
- What happens if our offset makes the letter go past ‘Z’? There are several ways to deal with this – we can either use the modulus operator creatively, or use a loop to add the offset value one at a time. In the latter case, if the letter becomes greater than ‘Z’ (note the single quotes), we can reset it back to ‘A’ and keep going.

Sample Output #1

```
Enter your message:
Hello World
Enter the offset value: 27

Sorry, we can only process messages with letters and spaces, and the
offset must be between 0 and 26.

Do you want to encrypt another message? (Y/N): Y

Enter your message:
Hello World!!
```

```
Enter the offset value: 3

Sorry, we can only process messages with letters and spaces, and the
offset must be between 0 and 26.

Do you want to encrypt another message? (Y/N): Y

Enter your message:
Hello World
Enter the offset value: 3

Your secret message is...
KHOOR ZRUOG

Do you want to encrypt another message? (Y/N): N

Closing out...
```