CS5001 HW2

Instructions

- Write your name as well as your NU ID on your assignment. Please number your problems.
- Submit both results and your code.
- Give complete answers. Do not just give the final answer; instead, show steps you went through to get there and explain what you are doing. Do not leave out critical intermediate steps.
- This assignment must be submitted electronically through Gradescope by September 30th, 2024 (Monday) by 11:59 PM.
- All of your codes must be commented.

Written Questions

1. **Why do we need Anaconda?**
2. **What is a function?**
3. **What is a lambda function?**
4. **What convention should we follow when naming variables?**

Coding Questions

1. Reverse a String

Write a function that calls itself, which takes a string and returns it in reverse order.
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Example Output:

```
Hello, Alice! You are 21 years old.
dlo sraey 12 era uoY !ecilA ,olleH
```

Hint: Use the `print()` function to display the reversed string. You can approach this problem by first reversing the string character by character, using the function calling itself to process the string one character at a time.

2. More Practice to Use Lambda Functions

- Write a lambda function that takes a list of numbers and returns the smallest number in the list.
- Write a lambda function that takes an integer and returns its square.
- Write a lambda function that takes a float and returns it rounded to two decimal places.
- Write a lambda function that takes three numbers and returns the average of those numbers.
- Write a lambda function that takes a character and returns `True` if it is a vowel, otherwise returns `False`.
- Write a lambda function that takes a list of strings and returns the longest string.

3. Rock, Paper, Scissors Game

Write a program where the computer randomly selects either "rock," "paper," or "scissors." Ask the user to input their choice of "rock," "paper," or "scissors." Compare the user's choice with the computer's selection and determine the winner according to the rules of the game. Provide feedback to the user about the choices made and declare a winner.

Example Output:

```
Please enter your choice (rock, paper, scissors): rock
Computer selected: scissors
Congratulations! You win. Rock beats scissors.
```

Hint: Use the `random` module to generate a random choice for the computer. Utilize conditionals (if, elif, else) to compare the player's choice and the computer's selection to determine the outcome of the game.

4. Palindrome Checker

Write a function that calls itself to check if a given string is a palindrome. A palindrome is a word or phrase that reads the same forwards and backwards, ignoring spaces, punctuation, and case.

Example Output:

```
Please enter a string: A man, a plan, a canal, Panama
The string is a palindrome.
```

Hint: Use the `replace()` function to remove spaces and punctuation, and the `lower()` function to handle case insensitivity. Use a function calling it self to compare the first and last characters, moving inward.