Fall 2022

CSC-121

Introduction to Computer Programming

Exam-2

Friday, October 14th 2022

Instructions:

- Phones turned off and, on your desk, facing down.
- You can only use concepts covered in class.
  - You cannot use strings or any string operations.
- You are free to define and use any functions
- You can call any functions defined in any another question of this exam.

By signing below, I certify that the work on this exam is my own

Printed Name: _____

Signature: _____

Question 1 **(40 points)**

Write a function **`reverse`** that takes as input a *positive integer* **`n`** and returns a (number with digits of **`n`** reversed. Examples: (25 points)

Input: 1234	*Output:* 4321
Input: 1	*Output*: 1
Input: 100	*Output*: 1

- If no inputs are passed, return 0. (5 points)
- Raise relevant errors for invalid input types and values, with informative error messages. (5 points)
- Write at least 5 test cases, covering a diverse set of scenarios. (5 points)

Question 2 **(25 points)**

Write a function **`is_palindrome`** that takes as input a *positive integer* **`num`** and returns **`True`** if **`num`** is a palindrome and **`False`** otherwise. (15 points)

A number is said to be a **Palindrome** if it reads the same backward as forward. For example, 101, 99 and 5 are all palindromic numbers.

- Raise relevant errors for invalid input types and values, with informative error messages. (5 points)
- Write at least 5 test cases, covering a diverse set of scenarios. (5 points)

Question 3 **(35 points)**

Write a function **`largest_palindrome`** that takes as input *a positive integer* ***n*** and returns the largest palindrome made **from product of two *n*-digit numbers**. (25 points)
For example,

For n=**1**, the largest palindrome made from the product of two **1**-digit numbers is 9 = 1 × 9
For n=**2**, the largest palindrome made from the product of two **2**-digit numbers is 9009 = 91 × 99
For n=**3**, the largest palindrome made from the product of two **3**-digit numbers is 906609 = 913 × 993
For n=**4**, the largest palindrome made from the product of two **4**-digit numbers is 99000099 = 9901 × 9999

- If no inputs are passed, use default value of 2 for ***n***. (5 points)
- Raise relevant errors for invalid input types and values, with informative error messages. (5 points)