**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:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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| **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:  *Input:* 1234 *Output:* 4321  *Input*: 1 *Output*: 1  *Input*: 100 *Output*: 1 | (25 points) |
| * 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) |

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| **Question 2** | **(20 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.  Write a function **is\_palindrome** that takes as input a positive integer **num** and returns **True** if **num** is a palindrome and **False** otherwise. | (10 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) |

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| **Question 3** | **(40 points)** |
| The **largest palindrome** made from the **product of two 2-digit numbers** is 9009 = 91 × 99 |  |
| Write a function **largest\_palindrome** that takes as input ***n*** and returns the largest palindrome made **from product of two *n*-digit numbers**. | (25 points) |
| * 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) |
| * Write at least 5 test cases, covering a diverse set of scenarios. | (5 points) |