CS 501B – Introduction to JAVA Programming
Fall 2023 Semester
Due: 11/10/2023 Friday at 11:59 PM

Instructions:

1. You are not allowed to use any package/library unless stated otherwise.
2. A skeleton Assignment7.java file is attached as a stub of code.
3. You are required to make the necessary changes in the Assignment7.java file.
4. We will be testing your code on hidden test cases.
5. Test your code with your own test cases.
6. Please comment your name and CWID in the first two lines of the Assignment1.java file.
7. Add comments in your code about what you are doing.
8. You are required to zip only Assignment7.java file as FirstName_LastName_Assignment#.zip (Ex: Roushan_Kumar_Assignment1.zip).
9. This assignment covers topics from week 9.
10. Students are not allowed to collaborate with classmates and any other people outside. All work must be done individually. Any work having evidence of showing academic dishonesty violation is subjected to zero for the assignment.

Penalty:

1. 10 marks will be deducted for invalid format of file / assignment submission.
2. If you submit after the due date then 10 marks will be deducted for every day after the due day.
3. If you submit an assignment after two weeks from the due date then you will get zero marks.

Questions:
Each question carries **25** points and total points is **100.**

1. Complete the method **`copyBinaryFile(String sourcePath, String destinationPath)`** that copies a binary file from the specified source path to the specified destination path. Handle any IOExceptions appropriately and ensure all file streams are closed properly.

   Example :
   copyBinaryFile("path/to/sourceFile.bin", "path/to/destinationFile.bin");
   Expected Output: A copy of **`sourceFile.bin`** at **`destinationFile.bin`**.

2. Complete the methods **`textToBinaryFile(String textFilePath, String binaryFilePath)`** and **`binaryToTextFile(String binaryFilePath, String textFilePath)`** for converting a

text file to a binary file and a binary file back to a text file, respectively. Handle character encoding and IOExceptions properly.

Example 1:
textToBinaryFile("path/to/textFile.txt", "path/to/binaryFile.bin");
Expected Output: A binary file `**binaryFile.bin**` created from `**textFile.txt**`.

binaryToTextFile("path/to/binaryFile.bin", "path/to/convertedTextFile.txt");
Expected Output: A text file `**convertedTextFile.txt**` created from `**binaryFile.bin**`.

3. Complete the method `**power(double base, int exponent)**` that calculates the power of a given number using recursion. If the exponent is negative, return 0. Optimize your solution for even exponents..

   Example 1:
   double result = power(2, 3);
   System.out.println(result); // Output: 8.0

   Example 2:
   double result = power(5, -2);
   System.out.println(result); // Output: 0.0

   Example 3:
   double result = power(3, 4);
   System.out.println(result); // Output: 81.0

4. Complete the method `**isPalindrome(String inputString)**` that checks if a given string is a palindrome using recursion. The method should return a boolean value. A palindrome is a string that reads the same forwards and backwards, ignoring spaces, punctuation, and case.

   Example 1:
   boolean result = isPalindrome("A man, a plan, a canal, Panama");
   System.out.println(result); // Output: true

   Example 2:
   boolean result = isPalindrome("Hello, World!");
   System.out.println(result); // Output: false