Programming Assignment – A

Team:
Ayisha S. R. Sowkathali
Sifaben Vahora

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1. Quadratic Equation

   We started out by creating 2 class, one for main and another for calculating the roots of the quadratic equation. In the Quadratic class, we created a method called calculate roots for finding the roots ‘p’ and ‘q’. The only issue we had while implementing this was figuring out how to output the ‘i’ (imaginary number) while computing the complex number.

2. Matrix Operations

We started out by creating two classes, one for main and other one for computing matrix operations. In main we took the size of the matrix as input from user and then we passed it as parameters to the methods of the matrix class. We then generated two matrix A and B with random values of same size. We then performed matrix addition and multiplications as needed. We outputted the result matrix using showMatrix method in matrix class. The only issue we had was when we tried to do the random generator for values it gave the same values for both matrices, to solve this problem we did we initialized random locally instead of globally.

3. Sorting

We started out by creating three classes, one class for performing quick sort which has 3 methods, to partition the array, to sort the array and to print the sorted list. One class for reading an input text file. And another class for main method. Using the read file class, we read the input text file, and stored the values from the file into the array to perform quick sort. We did not have much issues with this problem because we followed a pseudocode found online.

4. Numbers and Binary Strings

We created two classes, one for main, in which we created multiple private methods for generating strings of size n, in increasing order and to generate binary string of size without consecutive 1’s. Using another class, we took the input ‘n’ from the file and stored it in an array which we then passed it into methods as parameters to generate the different sizes of output strings. The only problem we had with this was when generating binary strings without consecutive 1’s as we had difficulties outputting the strings that didn’t have consecutive 1’s.

5. Dictionary

   For this problem, we managed using the public class alone in which we created a private method that returns a list which was created by throwing an exception of reading content from an input file. In that method, we read the data from input file using while loop and stored the content in an array of strings. We then created a linked list and stored the data from the array of string to the list so that we can output the corresponding meanings of the query entered by the user. We also created another private method that took the list as an argument and prompt the user to enter the query to check whether the list contains the query. The issue we had was that we first tried to read the input text file directly to the linked list, which we then figured out by adding the array of strings to the linked list.