**++CS512 – Assignment 1**

1. **Write a Python program that creates a matrix of 10 by 10 using the Data provided below.** 
   1. **Place the following data into a file and read the data into the matrix from a file called “Data.txt”**
   2. **Use random number to select three columns (ex: columns 3, 5, and 9) sort each column in ascending order and make a matrix of 10 by 3 using these three columns**
   3. **Use random number to select another distinct set of three columns (ex: columns 4, 8, 1). sort each column in descending order and make a matrix of 10 by 3 using these three columns - Call it matrix2. Note that the columns in Matrix 1 should not include any of the columns in Matrix 2**
   4. **Add the two matrices to each other and put the result into another 10 by 3 matrix call it matrix3**
   5. **Add the content of each row of Matrix 3 and put it into a new 10 by 1 matrix call it Matrix 4.**
   6. **Sort Matrix4 in Ascending order**

**You can use the following 10 by 10 in a file to get started:**

**26 8 2 12 67 89 8 78 56 7**

**13 9 57 11 10 99 15 90 88 15**

**6 23 28 32 53 59 48 41 60 62**

**17 6 93 95 20 25 29 31 71 30**

**16 13 26 22 14 66 71 5 2 91**

**40 53 22 18 44 73 77 84 89 88**

**34 54 89 8 65 74 96 3 1 80**

**14 28 39 44 86 88 75 77 93 4**

**65 66 82 97 51 41 28 33 55 79**

**13 48 71 98 26 38 55 59 7 19**

**Your output should be as follows:**

**The original matrix is as follows:**

**26 8 2 12 67 89 8 78 56 7**

**13 9 57 11 10 99 15 90 88 15**

**6 23 28 32 53 59 48 41 60 62**

**17 6 93 95 20 25 29 31 71 30**

**16 13 26 22 14 66 71 5 2 91**

**40 53 22 18 44 73 77 84 89 88**

**34 54 89 8 65 74 96 3 1 80**

**14 28 39 44 86 88 75 77 93 4**

**65 66 82 97 51 41 28 33 55 79**

**13 48 71 98 26 38 55 59 7 19**

**Suppose your first three random numbers are 3, 1, and 9. So you your out should prints:**

**The first three random numbers are 3, 1, and 9 which makes Matrix 1 as follows:**

**2 26 56**

**57 13 88**

**28 6 60**

**93 17 71**

**26 16 2**

**22 40 89**

**89 34 1**

**39 14 93**

**82 65 55**

**71 13 7**

**Adding Matrix1 and Matrix2 gives Martix3 which is:**

**Suppose the next first three random numbers are 3, 1, and 9. So you your out should prints:**

**The first three random numbers are 3, 1, and 9 which makes Matrix 1 as follows:**

**2 26 56**

**57 13 88**

**28 6 60**

**93 17 71**

**26 16 2**

**22 40 89**

**89 34 1**

**39 14 93**

**82 65 55**

**71 13 7**

**The sorted version of Matrix1 is :**

**2 6 1**

**22 13 2**

**26 13 7**

**28 14 55**

**39 16 56**

**57 17 60**

**71 26 71**

**82 34 88**

**89 40 89**

**93 65 93**

**Suppose the next set of three random numbers are 5, 2, and 7. So you your output should prints:**

**The second set of three random numbers are 5, 2, and 7 which makes Matrix 2 as follows:**

**67 8 8**

**10 9 15**

**53 23 48**

**20 6 29**

**14 13 71**

**44 53 77**

**65 54 96**

**86 28 75**

**51 66 28**

**26 48 55**

**Sorting Matrix 2 in descending order we get:**

**86 66 96**

**67 54 77**

**65 53 75**

**53 48 71**

**51 28 55**

**44 23 48**

**26 13 29**

**20 9 28**

**14 8 15**

**10 6 8**

**Adding the contents of the Matrix1 and Matrix2, and put the result in one column Matrix called Matrix 3**

**Matrix 1: Matrix 2 Matrix 3**

**2 26 56 86 66 96 332**

**57 13 88 67 54 77 356**

**28 6 60 65 53 75 287**

**93 17 71 53 48 71 353**

**26 16 2 51 28 55 178**

**22 40 89 44 23 48 266**

**89 34 1 26 13 29 192**

**39 14 93 20 9 28 203**

**82 65 55 14 8 15 239**

**71 13 7 10 6 8 115**

**After Sorting Matrix 3 you get:**

**115**

**178**

**192**

**203**

**239**

**266**

**287**

**332**

**353**

**356**

**main program should look as follows:**

* **OriginalMatrix = A1Object.getDataFromDataFile()**
* **#Printing(OriginalMatrix)**
* **ColA, ColB, ColC = GetThreeRandomNumber(OriginalMatrix)**
* **Matrix1 = MakeMatrix(OrioginalMatrix, ColA, ColB, ColC)**
* **#Printing(Matrix1)**
* **ColD, ColE, ColF = GetThreeRandomNumber(OriginalMatrix, ColA, CoilB, ColC)**
* **Matrix2 = MakeMatrix(OrioginalMatrix, ColD, ColE, ColF)**
* **#Printing(Matrix2)**
* **Matrix3 = AddingMatrices(Matrix1, Matrix2)**
* **#Printing(Matrix3)**
* **Matrix4 = AddingContentOfEachRow(Matrix3)**
* **#Printing(Matrix4)**
* **0Matrix5 = Sorting(Matrix4)**
* **#Printing(Matrix5)**
* **PrintOutput (OriginalMatrix, Matrix1, Matrix2, Matrix3, Matrix4, Matrix5)**