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WIX1002 Fundamentals of Programming
Tutorial 7 File Input and Output

1. Write statements for each of the following
    a. Store ten random integers within 0 to 1000 to a text file name integer.txt.

```
Random rd = new Random();
try{
   PrintWriter outputStream = new PrintWriter(new FileOutputStream("integer.txt"));


   for (int i = 0; i < 10; i++) {
      outputStream.print(rd.nextInt(1001) + " ");
   }


   outputStream.close();
} catch (IOException e){
   System.out.println("Problem with file output");
}
```

    b. Read from the text file generated in a. Display all the integer and the largest integer.

```
int max = -1;
try{
   Scanner inputStream = new Scanner(new FileInputStream("integer.txt"));


   while (inputStream.hasNextInt()) {
      int number = inputStream.nextInt();
      max = Math.max(max, number);
      System.out.print(number + " ");
   }
   System.out.println("\nThe largest number is " + max);


   inputStream.close();
} catch (FileNotFoundException e){
   System.out.println("File was not found");
}
```

c. Store ten random integers within 0 to 1000 to a binary file name integer.dat.

```
Random rd = new Random();
try {
   ObjectOutputStream outputStream = new ObjectOutputStream(new
FileOutputStream("integer.dat"));
   for (int i = 0; i < 10; i++) {
      outputStream.writeInt(rd.nextInt(1001));
   }
   outputStream.close();
} catch (IOException e){
   System.out.println("Problem with file output");
}
```

d. Read from the binary file generated in a c. Display the all the integer and the average.

```
double sum = 0.0, avg = 0.0;
int n = 0;
try{
   ObjectInputStream inputStream = new ObjectInputStream(new
FileInputStream("integer.dat"));
   try{
      while (true) {
         int value = inputStream.readInt();
         System.out.print(value + " ");
         sum += value;
         n++;
      }
      } catch (EOFException e){
         avg = sum / n;
         System.out.println("\nThe average is " + avg);
      }
   inputStream.close();
```

```
} catch (FileNotFoundException e){
   System.out.println("File was not found");
} catch (IOException e){
   System.out.println("Problem with file input");
}
```

2. Correct the error for the following statements.
   a. PrintWriter out = new PrintWriter(new FileOutputStream ("d:\data\matrix.txt"));

```
PrintWriter out = new PrintWriter(new FileOutputStream("d:/data/matrix.txt"));
```

   b.

```
try {
  PrintWriter out = new PrintWriter(new FileOutputStream("data.txt"));
  out.close();
} catch (FileNotFoundException e) {
  System.out.println("Problem with file output");
}
```

```
try{
   PrintWriter out = new PrintWriter(new FileOutputStream("data.txt"));
   out.close();
} catch (IOException e){
   System.out.println("Problem with file output");
}
```

   c.

```
int num;
Scanner a = new Scanner(new FileInputStream("data.dat"));
num = a.readInt();
a.close();
```

```
int num;
ObjectInputStream a = new ObjectInputStream(new FileInputStream("data.dat"));
num = a.readInt();
a.close();
```

d.

```
ObjectOutputStream o = new ObjectOutputStream (new FileOutputStream("data.dat"));
o.print('A');
o.close();
```

```
ObjectOutputStream o = new ObjectOutputStream (new FileOutputStream("data.dat"));
o.writeChar('A');
o.close();
```

3. Write a program that convert a sentence into binary number (ASCII code 8 bit) and store it in a text file named data.txt. Then, read from the text file and display the sentence.

```
import java.io.EOFException;
import java.io.FileInputStream;
import java.io.IOException;
import java.io.FileOutputStream;
import java.io.FileNotFoundException;
import java.io.ObjectInputStream;
import java.io.PrintWriter;
import java.util.Scanner;

public class T7Q3 {
   public static void main(String[] args) {
      // Create a Scanner object to read input
      Scanner sc = new Scanner(System.in);

      // Prompt message
      System.out.print("Enter a sentence: ");
      String sentence = sc.nextLine();

      // Store the binary number in text file
      try{
         PrintWriter outputStream = new PrintWriter (new FileOutputStream("data.txt"));

         for (int i = 0; i < sentence.length(); i++) {
```

```
            char letter = sentence.charAt(i);
            String binary = Integer.toBinaryString(letter);
            int binary_number = Integer.parseInt(binary);
            outputStream.printf("%08d\n", binary_number);
        }

        outputStream.close();
    }catch (IOException e){
        System.out.println("Problem with file output");
    }

    // Read the text file and display the sentence
    try{
        Scanner inputStream = new Scanner(new FileInputStream("data.txt"));

        while(inputStream.hasNextLine()){
            String input = inputStream.nextLine();
            int binary_number = Integer.parseInt(input);

            int ascii = 0; // in decimal value
            for (int i = 0; i < 8; i++) {
                ascii += ((binary_number % 10)*(int)(Math.pow(2, i)));
                binary_number /= 10;
            }

            char letter = (char)ascii;
            System.out.print(letter);
        }

        System.out.println("");
        inputStream.close();
    } catch (FileNotFoundException e){
        System.out.println("File was not found");
    } catch (IOException e){
```

```
            System.out.println("Error reading from file");
        }


        sc.close();
    }
}
```