CT3535 Assignment 3

Question 1:

Code:

Library1:

```
import java.util.ArrayList;

public class Library1 {
        //initialising variables
        String name;
        ArrayList<Book1> bookList = new ArrayList<Book1>();

        //constructor
        public Library1(String name) {
                this.name = name;
        }

        //accesors
        public String getName() {
                return name;
        }

        public ArrayList<Book1> getBooks(){
                return bookList;
        }


        //add & remove functions
        public void addBook(Book1 tome) {
                bookList.add(tome);
        }

        public void removeBook(Book1 tome) {
                bookList.remove(tome);
        }

        //toString method
        public String toString() {
                return "Name: " + name + "\n" + "Book List: " + bookList +
"\n";
        }

}
```

Book1:

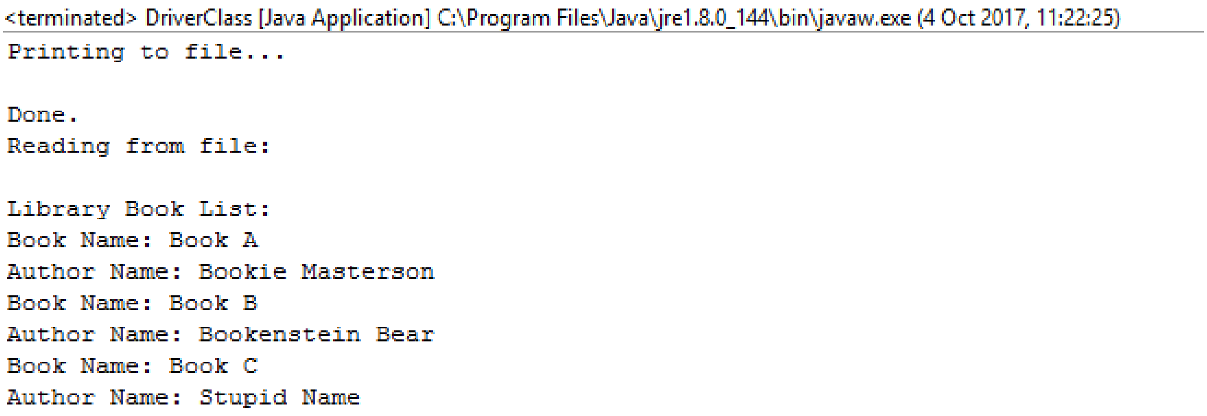
```
public class Book1 {
        //variables initialisation
        private String title;
        private String author;

        //constructor
        public Book1(String title, String author) {
                this.title = title;
                this.author = author;
        }
```

```
      //accessors
      public String getTitle() {
            return title;
      }
      public String getAuthor() {
            return author;
      }

      //mutators
      public void setTitle(String title) {
            this.title= title;
      }
      public void setAuthor(String author) {
            this.author = author;
      }

      //toString method
      public String toString() {
            return "Title: " + title + ", Author: " + author +"\n";
      }
}
```

DriverClass:

```
import java.io.*;
import java.util.List;

public class DriverClass {
      public static void main(String[] args) {

            //intialising variables
            Library1 library = new Library1("Local Library");
            Book1 bookA = new Book1("Book A", "Bookie Masterson");
            Book1 bookB = new Book1("Book B", "Bookenstein Bear");
            Book1 bookC = new Book1("Book C", "Stupid Name");


            //Adding book instances to library instance ArrayList
            library.addBook(bookA);
            library.addBook(bookB);
            library.addBook(bookC);


            //calling the functions below
            writeToFile(library.bookList);
            readFromFile(library.bookList);

      }

      public static void writeToFile(List<Book1> list) {
            //writes the content of the bookList to the LibraryBookList.txt
file
            System.out.println("Printing to file...\n");
            try {
                  FileWriter fileWriter = new
FileWriter("LibraryBookList.txt");
                  BufferedWriter writer = new BufferedWriter(fileWriter);

                  writer.write("Library Book List: \n");
                  //writes each elemet of list into the file
                  for(Book1 element:list) {
                        writer.write("Book Name: " + element.getTitle() +
"\n");

                        writer.write("Author Name: " + element.getAuthor()
+ "\n");
                  }


                  writer.close();
            } catch (IOException e) {
                  e.printStackTrace();
            }
            System.out.println("Done.");
      }

      public static void readFromFile(List<Book1> list) {
            //reads out the content of the .txt file
            System.out.println("Reading from file: \n");
            try {
                      File bookListFile = new File("LibraryBookList.txt");

                      FileReader fileReader = new FileReader(bookListFile);

                      BufferedReader reader = new
BufferedReader(fileReader);

                      String line = null;

                      while ((line = reader.readLine()) != null){
                        System.out.println(line);
                      }

                      reader.close();


            }catch (IOException e) {
                  e.printStackTrace();
            }

      }

}
```

Output:



```
<terminated> DriverClass [Java Application] C:\Program Files\Java\jre1.8.0_144\bin\javaw.exe (4 Oct 2017, 11:22:25)
Printing to file...

Done.
Reading from file:

Library Book List:
Book Name: Book A
Author Name: Bookie Masterson
Book Name: Book B
Author Name: Bookenstein Bear
Book Name: Book C
Author Name: Stupid Name
```

Question 2:

Code:

SerialLibrary1:

```
import java.io.Serializable;
import java.util.ArrayList;

public class SerialLibrary1 implements Serializable{

        private static final long serialVersionUID = 1L;
        //initialising variables
        String name;
        ArrayList<SerialBook1> bookList = new ArrayList<SerialBook1>();

        //constructor
        public SerialLibrary1(String name) {
                this.name = name;
        }

        //accesors
        public String getName() {
                return name;
        }

        public ArrayList<SerialBook1> getBooks(){
                return bookList;
        }


        //add & remove functions
        public void addBook(SerialBook1 tome) {
                bookList.add(tome);
        }

        public void removeBook(SerialBook1 tome) {
                bookList.remove(tome);
        }

        //toString method
        public String toString() {
                return "Name: " + name + "\n" + "Book List: " + bookList +
"\n";
        }

}
```

SerialBook1:

```
import java.io.Serializable;

public class SerialBook1 implements Serializable{

        private static final long serialVersionUID = 1L;
        //variables initialisation
        private String title;
        private String author;
```

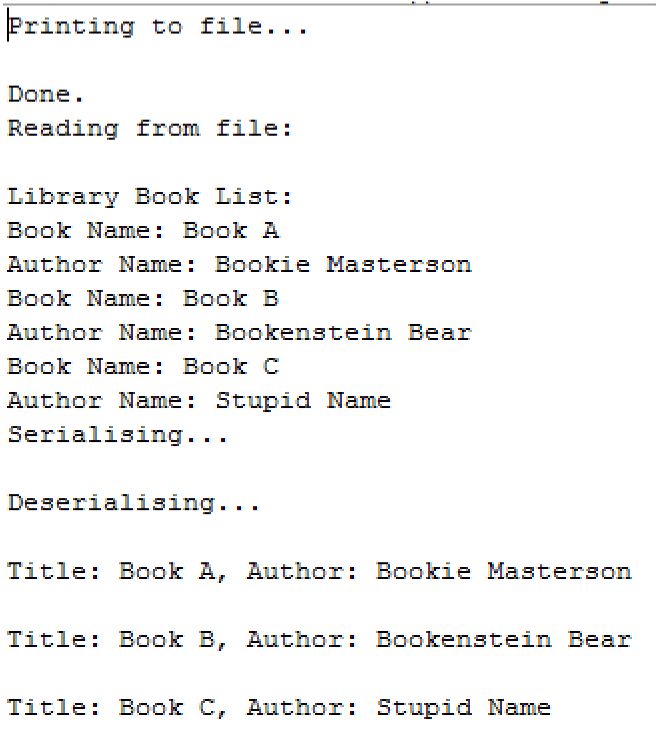
```
      //constructor
      public SerialBook1(String title, String author) {
            this.title = title;
            this.author = author;
      }

      //accessors
      public String getTitle() {
            return title;
      }
      public String getAuthor() {
            return author;
      }

      //mutators
      public void setTitle(String title) {
            this.title= title;
      }
      public void setAuthor(String author) {
            this.author = author;
      }

      //toString method
      public String toString() {
            return "Title: " + title + ", Author: " + author +"\n";
      }
}
```

SerialDriver:

```
import java.io.*;
import java.util.List;

public class SerialDriverClass {
      public static void main(String[] args) {

            //intialising variables
            SerialLibrary1 library = new SerialLibrary1("Local Library");
            SerialBook1 bookA = new SerialBook1("Book A", "Bookie
Masterson");
            SerialBook1 bookB = new SerialBook1("Book B", "Bookenstein
Bear");
            SerialBook1 bookC = new SerialBook1("Book C", "Stupid Name");


            //Adding book instances to library instance ArrayList
            library.addBook(bookA);
            library.addBook(bookB);
            library.addBook(bookC);


            //calling the functions below
            writeToFile(library.bookList);
            readFromFile(library.bookList);
            serialise(library.bookList);
            deserialise(library.bookList);

      }
    public static void serialise(List<SerialBook1> list){
      System.out.println("Serialising... \n");
        try {
            // create a connection stream (to write bytes)
            FileOutputStream fileStream = new
FileOutputStream("LibraryBookList.dat");
            // create a chain stream (turns objects into data that can be
written to a stream)
            ObjectOutputStream os = new ObjectOutputStream(fileStream);
            // call writeObject() on the Object stream
            os.writeObject(list);

            os.close();
      }catch (Exception e) {
          e.printStackTrace();
            }

    }

      @SuppressWarnings("unchecked")

    public static void deserialise(List<SerialBook1> list){
      System.out.println("Deserialising... \n");
      try{
          FileInputStream fileStream = new
FileInputStream("LibraryBookList.dat");

          ObjectInputStream os = new ObjectInputStream(fileStream);

          List<SerialBook1> emp = (List<SerialBook1>)os.readObject();

            for (SerialBook1 element:emp){
                System.out.println(element.toString());
            }
            os.close();

      } catch (Exception e) {
            e.printStackTrace();
      }

    }  // end deserialise method


      public static void writeToFile(List<SerialBook1> list) {
            //writes the content of the bookList to the LibraryBookList.txt
file
            System.out.println("Printing to file... \n");
            try {
                  FileWriter fileWriter = new
FileWriter("LibraryBookList.txt");
                  BufferedWriter writer = new BufferedWriter(fileWriter);

                  writer.write("Library Book List: \n");

                  //writes each elemet of list into the file
                  for(SerialBook1 element:list) {
                        writer.write("Book Name: " + element.getTitle() +
"\n");
                        writer.write("Author Name: " + element.getAuthor()
+ "\n");
                  }


                  writer.close();
            } catch (IOException e) {
```

```
                        e.printStackTrace();
                }
                System.out.println("Done.");


        }

        public static void readFromFile(List<SerialBook1> list) {
                //reads out the content of the .txt file
                System.out.println("Reading from file: \n");
                try {
                                File bookListFile = new File("LibraryBookList.txt");

                                FileReader fileReader = new FileReader(bookListFile);

                                BufferedReader reader = new
BufferedReader(fileReader);

                                String line = null;

                                while ((line = reader.readLine()) != null){
                                  System.out.println(line);
                                }

                                reader.close();


                }catch (IOException e) {
                        e.printStackTrace();
                }


        }

}
```

Output:



```
Printing to file...

Done.
Reading from file:

Library Book List:
Book Name: Book A
Author Name: Bookie Masterson
Book Name: Book B
Author Name: Bookenstein Bear
Book Name: Book C
Author Name: Stupid Name
Serialising...

Deserialising...

Title: Book A, Author: Bookie Masterson

Title: Book B, Author: Bookenstein Bear

Title: Book C, Author: Stupid Name
```