Unit 8 Programming Problems Worksheet

Programming Problem 1 – Fraction

Consider the following class:

```
public  class Fraction{
            private int numerator;
            private int denominator;
            private static char slash = '/',
}
```

Write a program to instantiate an object of the Fraction class to test the class.. Add a constructor(s), set and get methods to the Fraction class appropriately. Using the Serializable Interface, instantiate and write three Fraction objects to a file called "SerialF.dat." A loop must be used when creating and writing the three objects to the file. You can select the values you wish to use for the denominator and numerator.

Directions

- Create the Fraction Class.
    - Add a constructor(s), set and get methods to the Fraction class appropriately.
    - Ensure the class is Serializable.
- Use a loop to create three Fraction objects.
    - Initialize the three objects,
    - Write each object to the file"SerialF.dat."
    - Display an appropriate message if an exception occurs.

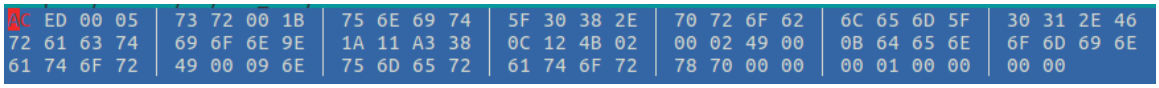
Grading Rubric

Task	Points
Fraction class implements Serializable	0.5
The main method throws an IOException	1
The file "SerialF.dat" is created properly	1
Loop used to instantiate objects	1
Objects are correctly written to file "SerialF.dat"	1
The file "SerialF.dat" is closed appropriately	0.5
Proper documentation	1

Program works effectively	1
Total	**7**

Screenshots

As stated in the assumptions in this problem, it does not produce output if all went well; so the screenshot is that of the SerialF.dat file viewed in mc's hex viewer.



Programming Problem 2 – ReadMe

The pledge of Allegiance states, "I pledge allegiance to the Flag of the United States of America, and to the Republic for which it stands: one Nation under God, indivisible, With Liberty and Justice for all." Save the pledge, 174 characters, to a text file. Use the RandomAccessFile class to access the file. Using Seek method, display the characters at positions 124 and 135 only.

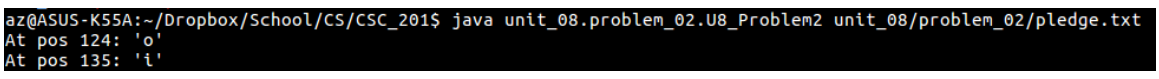
Directions

- Create a text file with the pledge of allegiance named Pledge.txt using notepad.
- Create a reference to the file, Pledge.txt, using the RandomAccessFile class.
- Use the Seek method to point at positions 124 and 135, then display the characters represented by the byte streams.
- Use try, catch and finally blocks for exception handling.

Grading Rubric

Task	Points
Throws clause added in main method of the ReadMe class	1
Create a reference of the RandomAccessFile class which points to Pledge.txt	1
Include try, catch and finally blocks for exception handling	1
Use the Seek method to point at positions 124 and 135, then display characters represented by the byte streams	1
Proper documentation	1
Program works effectively	1
Total	**6**

Screenshots



Programming Problem 3 – ReadWrite

Write an application which will write five student ID numbers and GPAs to a "rw" file called "Stu.dat" and then allow you to display the GPA of any student upon entering their ID number, for any number of students.

Directions

- Import the classes necessary to support your application.
- Create a class called ReadWrite. This class has no properties or behaviors.
- Create a main method which will include the following:
    - Add an appropriate throws statement in the main method.
    - Create a reference to a text file called "Stu.dat" with "rw" access.
    - Include try and catch blocks for exception handling.
    - Use a loop to interactively assign student ID numbers and their GPA scores.
    - With the use of a second loop, display the GPA for specific student ID numbers.
    - Use a sentinel to determine when you wish to stop the program.
    - Include a finally block within your program.

Note: User defined methods are not required but may be used if you prefer.

Grading Rubric

Task	Points
Throws clause added in main method	0.25
Create a reference to the RandomAccessFile class	1
Include try and catch blocks for exception handling	1
Use a loop to interactively assign student ID numbers and their GPA scores	1
Use of a second loop to display the GPA for specific student ID numbers	1
Use of a sentinel to determine when you wish to stop the program	0.25
Include a finally block within your program	0.5
Proper documentation	1
Program works effectively	1

Total	7

Screenshots

```
Add students
Enter id <= 0 to fininsh input
Enter an id(int) and a gpa(double): 1 4.0
Enter an id(int) and a gpa(double): 2 3.1
Enter an id(int) and a gpa(double): 3
2
Enter an id(int) and a gpa(double): 6 1.1
Enter an id(int) and a gpa(double): 0
Enter a student ID(<=0 to quit): 5
no student with id 5 exists
Enter a student ID(<=0 to quit): 6
gpa for student with id 6: 1.10
Enter a student ID(<=0 to quit): 1
gpa for student with id 1: 4.00
Enter a student ID(<=0 to quit): -99
```