CIS 43 – Final Exam Lab

YOU MUST DO #2 AND #5. YOU MAY THEN PROCEEDED TO ALL OTHER PROGRAMS. DO ANY OF THE OTHERS THAT YOU WOULD LIKE TO DO FOR MAXIMUM CREDIT. WORK AT YOUR OWN PASTE.

1. (12pts)Write a class that writes an object to a file, and another one to read the object from the file. Both classes must work for full credit.
2. (20 pts){ 3, 5, 6, 10} { 4, 8, 9, 20} {30,40,40 80}

Write a class called ‘BuildArray’ using these three rows, show how you would initialize a two dimensional array. Show how you would fill the array with these values. Your class should have a method called ‘**fill’** that will initialize the array with values. Your program should also have a method called ‘**show**’ that will loop through the array and print all the elements in the array. Finally, you should have a method called sumMatrix declared as follows:

* public static double sumMatrix( int[][] m )

that will sum all the integers in the matrix of integers.

Use Exception Handling.

1. (6 pts) Write a class that adds and multiplies two numbers. Your methods in the class should ‘throw an exception if someone tries to divide by zero.
2. (8 pts) Write a class called MyRecursive that has a method to recursively compute the factorial of 4. Draw a simple UML digram to represent the class.
3. (20 pts)Write your own program that demonstrates the principals of object oriented programming in Java. This program should include as many of the object oriented concepts as possible. Please make sure that you comment your work, and use best practices by using lots of methods within your classes. For full points, you should include comments, validation and good object oriented design.
4. (6.pts) Write a program that passes a string to the main method and displays the number of uppercase letters in a string.
5. (10 pts.) (Writing /Reading Data) Write a program to create a file named ‘YourName-FinalExam’ if it does not exist. Write 100 integers created randomly into the file using text I/O. Integers are separated by spaces in the file. Read the data back from the file and display the Data. For an extra 2 points, display the sorted data.
6. (6pts.).Write a program that displays a diamond using asterisks.’\*’. If the user enters 5, then the diamond will have a maximum width of five.
7. (6 pts.) Write a program to GUIFY the program in #8 above, so that the diamond appears in a GUI.
8. (15 points). A little GYM has issues keeping track of members that have registered. If a member pays 150.00/month, they can attend 3 days out of the week. If they pay $120.00/month, they can attend only two times per week. $100.00 will let them go only once per week. Everytime the member goes to the gym, they must sign up. However the sign in sheet is cumbersome to keep track of. Therefore we need a computer program that will allow them to sign in. When the user gets to the sign in screen and types in their name, the program will verify that the user is a valid member. The program will look into a database(we will use a text file) to find out the user name and how much they have paid for the month. The program will then subtract the current day from the number of days left. It will say, “Welcome ‘Joe’”, you now have 2 days left this week—that is if joe had a 3 day per week membership and he just signed in for the day. If the user has already attended for the number of days they paid for, you should tell them that they have exceeded the maximum number of days.