Exercise 1: I/O Exceptions (Input Validation):

Write a Java program to calculate and display a customer water bill. Water costs more per gallon as use increases. Follow the following rules in the table for calculating the water bill.

Single-family and Duplex Water Rates

Single-family and duplex water rates have a base charge and three tiers.

Water		Single-Family	Duplex
Base Charge		$13.21	$15.51
Tier	Volume Charge per 1,000 Gallons		
1	0–7,000 Gallons	$2.04	
	0–9,000 Gallons		$1.97
2	7,001–13,000 Gallons	$2.35	
	9,001–13,000 Gallons		$2.26
3	Over 13,000 Gallons	$2.70	$2.60
Charges rounded to the nearest cent. Actual costs vary due to rounding.			

Note: Even though water rates are given as a rate per 1,000 gallons, the actual rates are still calculated on a per gallon rate. (i.e. for tier 1 the rate is $.00204 per gallon)

Use **JOptionPane** for all input and output.

Let's do some examples:

Single family, 9000 gallons

Water Bill = Base charge + 7000 * 2.04 /1000.0 + (9000 – 7000) * 2.35/ 1000.0

= 13.21 + 7000 * 0.00204 + 2000 * 0.00235

= 13.21 + 14.28 + 4.70

= 32.19

Duplex, 15000 gallons

Water Bill = Base charge + 9000 * 0.00197 + 4000 * 0.00226 + (15000-13000) * 0.00260

= 15.51 + 9000 * 0.00197 + 4000 * 0.00226 + 2000 * 0.00260

= 15.51 + 17.73 + 9.04 + 5.20

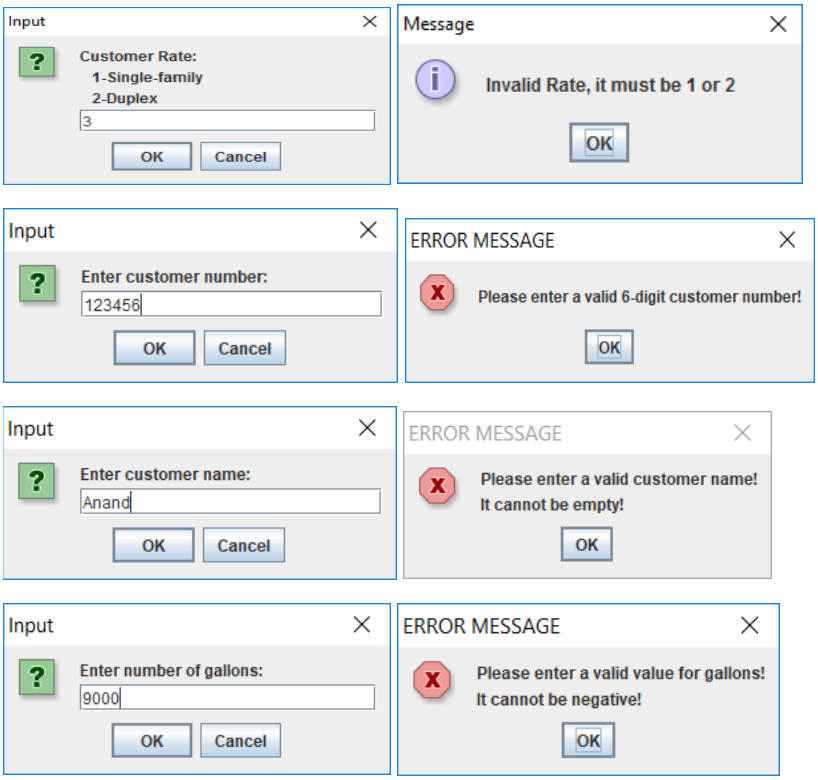
= 47.48

Program Data:

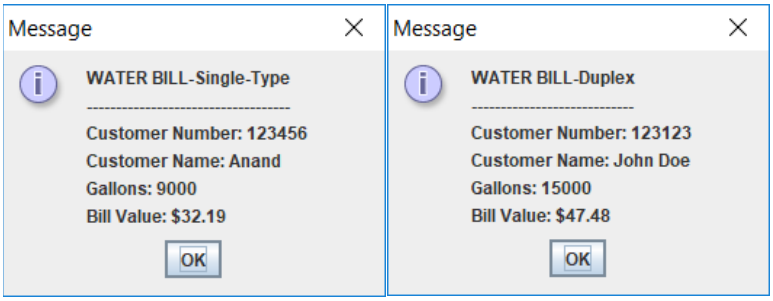
Customer Rate (1-Single-family, 2-Duplex): 1

Customer number: 223344 (**required input from a user and must be 6 digits**)
Customer Name: Michael Wells (**required input from a user, validation is required**)
Base charge: 16.33 (Must be a constant)
Volume charge, per 1,000 Gallons: 0.00253 (part of program data, can be a constant)
Number of gallons: 7000 (**required input from the user and must not be a negative**)

Program input sample: **ERROR MESSAGES(as required)**



Program output sample:



Instructions: Use the JOptionPane class for the program input and output, and if you need to format the program output

Use Try{} Catch {} for input validation. For some input validations, you can also use if-statement. No need to use loop statements for users to re-enter a correct data format. The floating-point numbers must be rounded to 2 decimal places.