

## Exercise 2: Loops and Arrays:

Write a Java program that calculates 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.

At program start, the program must (FIRST) ask the user for the number of customers, such as n customers. Then the program creates five arrays of size n to store

- customer type (**String[] custTypeArr**),
- customer names (**String [] custNameArr**),
- customer numbers (**int [] custNumArr**),
- number of gallons (**double [] gallonsArr**) and
- bill values (**double [] billArr**).

For each customer, store the customer type, number, name, gallons, and bill values into the **corresponding** arrays, at index (0, 1, 2, 3, ..., n), respectively.

### 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		
	0–7,000 Gallons	\$2.04	
1	0–9,000 Gallons		\$1.97
	7,001–13,000 Gallons	\$2.35	
2	9,001–13,000 Gallons		\$2.26
	Over 13,000 Gallons	\$2.70	\$2.60
3			
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.

**Program input sample:**

**ERROR MESSAGES(as required)**

Input

?

Enter number of customers:

2

OK Cancel

Message

i

Invalid Value!  
Enter a valid number of customers.  
Ex:2

OK

Input

?

Customer Rate:  
1-Single-family  
2-Duplex

3

OK Cancel

Message

i

Invalid Rate, it must be 1 or 2

OK

Input

?

Enter customer number:

123456

OK Cancel

ERROR MESSAGE

x

Please enter a valid 6-digit customer number!

OK

Input

?

Enter customer name:

Anand

OK Cancel

ERROR MESSAGE

x

Please enter a valid customer name!  
It cannot be empty!

OK

Input

?

Enter number of gallons:

9000

OK Cancel

ERROR MESSAGE

x

Please enter a valid value for gallons!  
It cannot be negative!

OK

**Program output sample:**

WATER BILL CALCULATOR

i

WATER BILL

NUMBER	NAME	TYPE	GALLON	BILL VALUE
520124	Anand	Single	9650.0	\$33.72
425301	Bobby	Duplex	8500.0	\$32.26

OK

**Instructions:** Use the JOptionPane class for the program input and output, and if you need to format the program output, use the **String formatValue = String.format("%.2f", value)** or any Java utility class to format the output.

**Also,** the program must not crash on an invalid user input format. Hence, use try-catch statements to handle a user's invalid inputs.