CSA0961 – JAVA

PRACTISE 4_1

1. The formula for converting gallons to liters is: 1 US gallon = 3.785 liters. This program will convert a specific number of gallons (10) to liters and then display the output. The concepts in this practice will be explored in more detail throughout the course. Create a new project, package, and java class with a main method. Use the code below as a starting point and complete the code for the program. (Name your package galToLit and class GalToLit).

```
package galToLit;

 public class GalToLit {

public static void main(String[] args) {

 // declare variables double gallons=10;

double liters=0; // add your calculation here //output the result to user

System.out.println(gallons+" gallons equals "+liters+" liters"); } }
```

ANSWER :

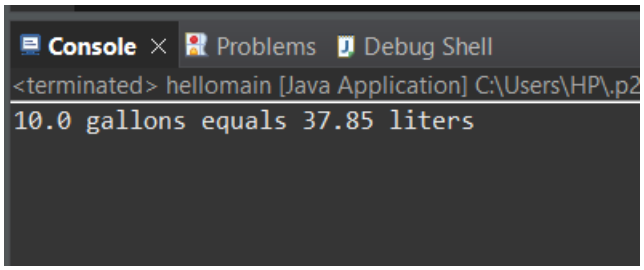
```
package helloworld;


public class hellomain {
    public static void main(String[] args) {
        // declare variables
        double gallons = 10;
        double liters = 0;


        // add your calculation here
        liters = gallons * 3.785; // 1 US gallon = 3.785 liters


        // output the result to user
        System.out.println(gallons + " gallons equals " + liters + " liters");
    }
}
```

OUTPUT :



2. The Scanner class can be used to accept input from the user. Modify the code written in step 2 to prompt a user for the number of gallons to compute. To declare an instance of the Scanner class, use the code below: Scanner in = new Scanner(System.in); Your Java IDE may prompt you to import the java.util.Scanner package, or you can manually enter the import statement between the package name and the class declaration as shown below:

package galToLit;

import java.util.Scanner;

public class GalToLit {

To get a decimal value from the user, use the in.nextDouble() method and assign to the gallons variable.

ANSWER :

package helloworld;

import java.util.Scanner;

public class hellomain {

```
    public static void main(String[] args) {
        // Create a Scanner object to read input
        Scanner in = new Scanner(System.in);

        // Declare variables
        double gallons = 0;
        double liters = 0;

        // Prompt the user for the number of gallons
        System.out.print("Enter the number of gallons: ");
```

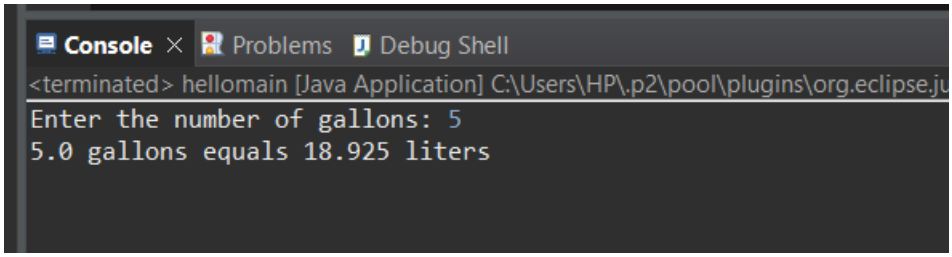
```
        // Get the number of gallons from user input
        gallons = in.nextDouble();

        // Perform the conversion
        liters = gallons * 3.785; // 1 US gallon = 3.785 liters

        // Output the result to the user
        System.out.println(gallons + " gallons equals " + liters + " liters");

        // Close the scanner
        in.close();
    }
}
```

OUTPUT :



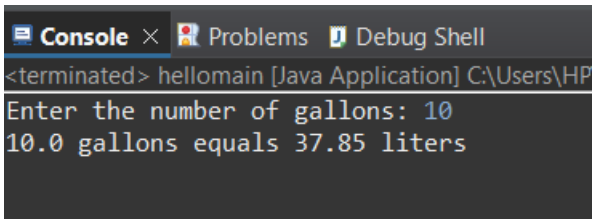
3.Describe three ways you can test the program that converts gallons to liters.

TESTING THE ABOVE PROGRAM WITH DIFFERENT INPUTS :

- **Example Inputs and Expected Outputs:**

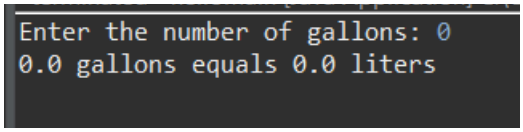
Input: 10 gallons

Expected Output: 10 gallons equals 37.85 liters



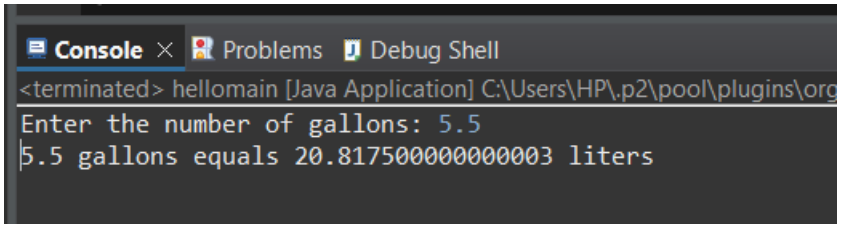
Input: 0 gallons

Expected Output: 0 gallons equals 0.0 liters



Input: 5.5 gallons

Expected Output: 5.5 gallons equals 20.8275 liters



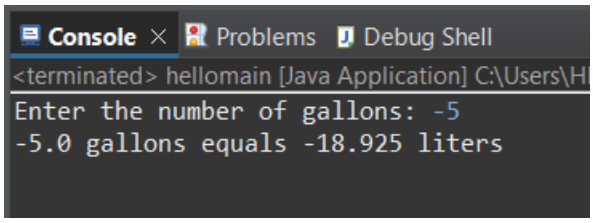
Verification: Compare the program's output against the expected results to ensure accuracy.

Rationale: This tests the core functionality of the conversion algorithm with a range of valid inputs.

Example Edge Cases:

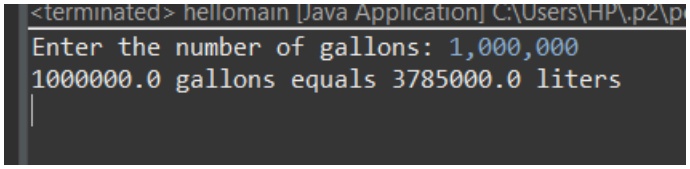
Negative Input: Input: -5 gallons

Expected Output: -5 gallons equals -18.925 liters (Verify the program handles negative values appropriately, or decide if negative inputs should be restricted.)



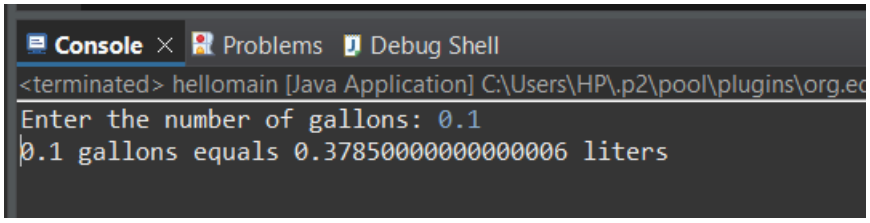
Large Input: Input: 1,000,000 gallons

Expected Output: 1,000,000 gallons equals 3,785,000 liters (Check if the program can handle very large numbers without performance issues or overflow.)



Decimal Input: Input: 0.1 gallons

Expected Output: 0.1 gallons equals 0.3785 liters (Ensure the program handles small decimal values accurately.)



Rationale: Testing edge cases helps ensure the program is robust and behaves as expected in less common scenarios.

Test for Invalid Inputs

Example Invalid Inputs:

Non-Numeric Input: Input: abc

Expected Behavior: The program should either handle the error gracefully (e.g., with an error message) or prompt the user to enter a valid number.