**Question**

Write a Java program to input a binary number and print it’s equivalent decimal number

Classname: BtoD

Instance variables:

int bin : to store the binary number

int dec: to store decimal number equivalent

Member methods:

BtoD() – Parameterized constructor to initialize the data members with user defined value and dec with default value .

void convert() – convert binary number into equivalent decimal form.

void display() – display the original number and it’s decimal form.

Write a main method to create an object of the class and invoke the above methods .

**Algorithm**

1. Start

2. Define a class `btoD` with two instance variables:

- `bin` of type `int` to store the binary number.

- `dec` of type `int` to store the decimal number equivalent.

3. Define a parameterized constructor for the class `btoD`:

- Accept an integer `binaryNumber` as a parameter.

- Initialize `bin` with `binaryNumber`.

- Initialize `dec` with 0.

4. Define a method `convert()` to convert the binary number into its decimal equivalent:

- Initialize a temporary variable `temp` with the value of `bin`.

- Initialize a variable `power` with 0.

- While `temp` is greater than 0:

- Calculate `lastDigit` as `temp % 10`.

- Update `dec` by adding `lastDigit \* Math.pow(2, power)`.

- Divide `temp` by 10 to remove the last digit.

- Increment `power` by 1.

5. Define a method `display()` to display the original binary number and its decimal form:

- Print the binary number stored in `bin`.

- Print the decimal number stored in `dec`.

6. In the main method:

- Create a `Scanner` object to read input from the user.

- Prompt the user to enter a binary number.

- Read the binary number into an integer variable `binaryNumber`.

- Create an object of the class `btoD` with `binaryNumber`.

- Call the `convert()` method on the object to convert the binary number to decimal.

- Call the `display()` method on the object to print the binary and decimal numbers.

- Close the `Scanner` object.

7. End

**Variable Description Table**

|  |  |  |
| --- | --- | --- |
| Variable Name | **Data Type** | **Description** |
| bin | int | Stores the binary number input by the user. |
| bin | int | Stores the decimal equivalent of the binary number. |
| binaryNumber | int | Temporarily stores the binary number input by the user in the main method. |
| temp | int | Temporary variable used in the convert() method to process the binary number. |
| power | int | Used in the convert() method to keep track of the power of 2 for conversion. |
| lastDigit | int | Stores the last digit of the binary number during conversion in the convert method. |
| scanner | Scanner | Scanner object used to read input from the user in the main method |