1.a.

```
import java.util.Scanner;
public class ReadInteger {
   public static void main(String[] args) {
     Scanner scanner = new Scanner(System.in);
     System.out.print("Enter an integer: ");
      int enteredInteger = scanner.nextInt();
      System.out.println("You entered: " + enteredInteger);
      scanner.close();
   }
}
```

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1.b.

```
import java.util.Scanner;

public class CalculateAverage {
   public static void main(String[] args) {
       Scanner scanner = new Scanner(System.in);
       System.out.print("Enter the first floating-point number: ");
       double num1 = scanner.nextDouble();

       System.out.print("Enter the second floating-point number: ");
       double num2 = scanner.nextDouble();

        double average = (num1 + num2) / 2;

       System.out.printf("The average is: %.2f%n", average);
       scanner.close();
   }
}
```

---

2.

```
import java.util.Scanner;

public class BasicCalculator {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        System.out.println("Welcome to the Basic Calculator!");
        System.out.print("Enter the first number: ");
        double num1 = scanner.nextDouble();

        System.out.print("Enter the second number: ");
        double num2 = scanner.nextDouble();

        System.out.print("Enter the operator (+, -, *, /): ");
        char operator = scanner.next().charAt(0);

        double result;

        switch (operator) {
            case '+':
                result = num1 + num2;
                System.out.println("Result: " + result);
                break;
            case '-':
                result = num1 - num2;
                System.out.println("Result: " + result);
                break;
            case '*':
                result = num1 * num2;
                System.out.println("Result: " + result);
                break;
            case '/':
```

```
            if (num2 != 0) {
                result = num1 / num2;
                System.out.println("Result: " + result);
            } else {
                System.out.println("Error: Cannot divide by zero!");
            }
            break;
        default:
            System.out.println("Error: Invalid operator!");
    }

    scanner.close();
  }
}
```

---

3.

```
import java.util.HashSet;
import java.util.Set;

public class HappyNumber {
  public static void main(String[] args) {
    int n = 19; // You can change this to test other numbers
    System.out.println(isHappy(n));
  }

  public static boolean isHappy(int n) {
    Set<Integer> seen = new HashSet<>();

    while (n != 1 && !seen.contains(n)) {
      seen.add(n);
      n = getNextNumber(n);
    }
```

```
        return n == 1;
    }

    private static int getNextNumber(int n) {
        int sum = 0;
        while (n > 0) {
            int digit = n % 10;
            sum += digit * digit;
            n /= 10;
        }
        return sum;
    }
}
```