Problem Statement

Write code which accepts an integer from the user and prints out the number of digits in the number that have the value 5. For example, if the user inputs the number 5025036, the program should print out 2. If the user entered 743, the program would print out 0. (You may assume that the integer the user enters is non-negative.)
Idea:

- “Pull off” the right-most digit
- If it's a 5, increase our count, otherwise don't
- Keep “pulling off” digits until there are no more digits left in our number
<table>
<thead>
<tr>
<th>Number</th>
<th>Last Digit</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>5025036</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>502503</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>50250</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5025</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>502</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>50</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>0</td>
<td>5</td>
<td>2</td>
</tr>
</tbody>
</table>
Problem Decomposition

- Figure out small pieces to work on and then put the pieces together to make a complete solution
  - How to “pull off” a digit.
  - How to decrease original number
  - How to keep count if digit is 5.
  - How to repeat until there are no more digits left
Problem Decomposition

- Figure out small pieces to work on and then put the pieces together to make a complete solution
  - How to “pull off” a digit. %10
  - How to decrease original number /10
  - How to keep count if digit is 5.
  - How to repeat until there are no more digits left
Step 1

```java
import java.util.Scanner;

public class Digits {
    public static void main(String[] args) {
        Scanner in = new Scanner(System.in);
        System.out.print("Enter an integer number: ");
        int num = in.nextInt();

        System.out.println("Original number: "+ num);

        int digit = num % 10;
        System.out.println("Last digit: "+ digit);

        num /= 10;
        System.out.println("New number: "+ num);
    }
}
```
Problem Decomposition

- Figure out small pieces to work on and then put the pieces together to make a complete solution
- How to “pull off” a digit. \( \%10 \)
- How to decrease original number \( \div 10 \)
- How to keep count if digit is 5.
- How to repeat until there are no more digits left
Step 2

```java
import java.util.Scanner;

public class Digits {
    public static void main(String[] args) {
        Scanner in = new Scanner(System.in);
        System.out.print("Enter an integer number: ");
        int num = in.nextInt();
        System.out.println("Original number: "+ num);
        int digit = num % 10;
        System.out.println("Last digit: "+ digit);
        num /= 10;
        System.out.println("New number: "+ num);
        int count = 0;
        if (digit == 5) {
            count++;
        }
    }
}
```
Problem Decomposition

- Figure out small pieces to work on and then put the pieces together to make a complete solution
  - How to “pull off” a digit. \( \%10 \)
  - How to decrease original number \(/10\)
  - How to keep count if digit is 5.
  - How to repeat until there are no more digits left while loop
Step 3

```
import java.util.Scanner;

public class Digits {
    public static void main(String[] args) {
        Scanner in = new Scanner(System.in);
        System.out.print("Enter an integer number: ");
        int num = in.nextInt();

        System.out.println("Original number: " + num);

        while (num != 0) {
            int digit = num % 10;
            System.out.print("Last digit: "+ digit);
            num /= 10;
            System.out.println("New number: " + num);
            if (digit == 5) {
                ++count;
            }
        }
        System.out.println("The number 5 appeared " + count + " times.");
    }
}
```
Step 3: Refined

```java
import java.util.Scanner;

public class Digits {
    public static void main(String[] args) {
        Scanner in = new Scanner(System.in);
        System.out.print("Enter an integer number: ");
        int num = in.nextInt();

        System.out.println("Original number: "+ num);

        int count = 0;

        while (num != 0) {
            int digit = num % 10;
            System.out.println("Last digit: "+ digit);

            num /= 10;
            System.out.println("New number: "+ num);

            if (digit == 5) {
                count++;
            }
        }

        System.out.println("The number 5 appeared "+ count + " times.");
    }
}
```
What Happens If...?

```java
import java.util.Scanner;

public class Digits {
    public static void main(String[] args) {
        Scanner in = new Scanner(System.in);
        System.out.print("Enter an integer number: ");
        int num = in.nextInt();

        System.out.println("Original number: "+num);

        int count = 0;

        while (num != 0) {
            int digit = num % 10;
            System.out.println("Last digit: "+digit);
            num /= 10;
            System.out.println("New number: "+num);

            if (digit == 5) {
                count++;
            }
        }
        System.out.println("The number 5 appeared "+count+" times.");
    }
}```