Java operators and their precedence and associativity

Assignment Solutions
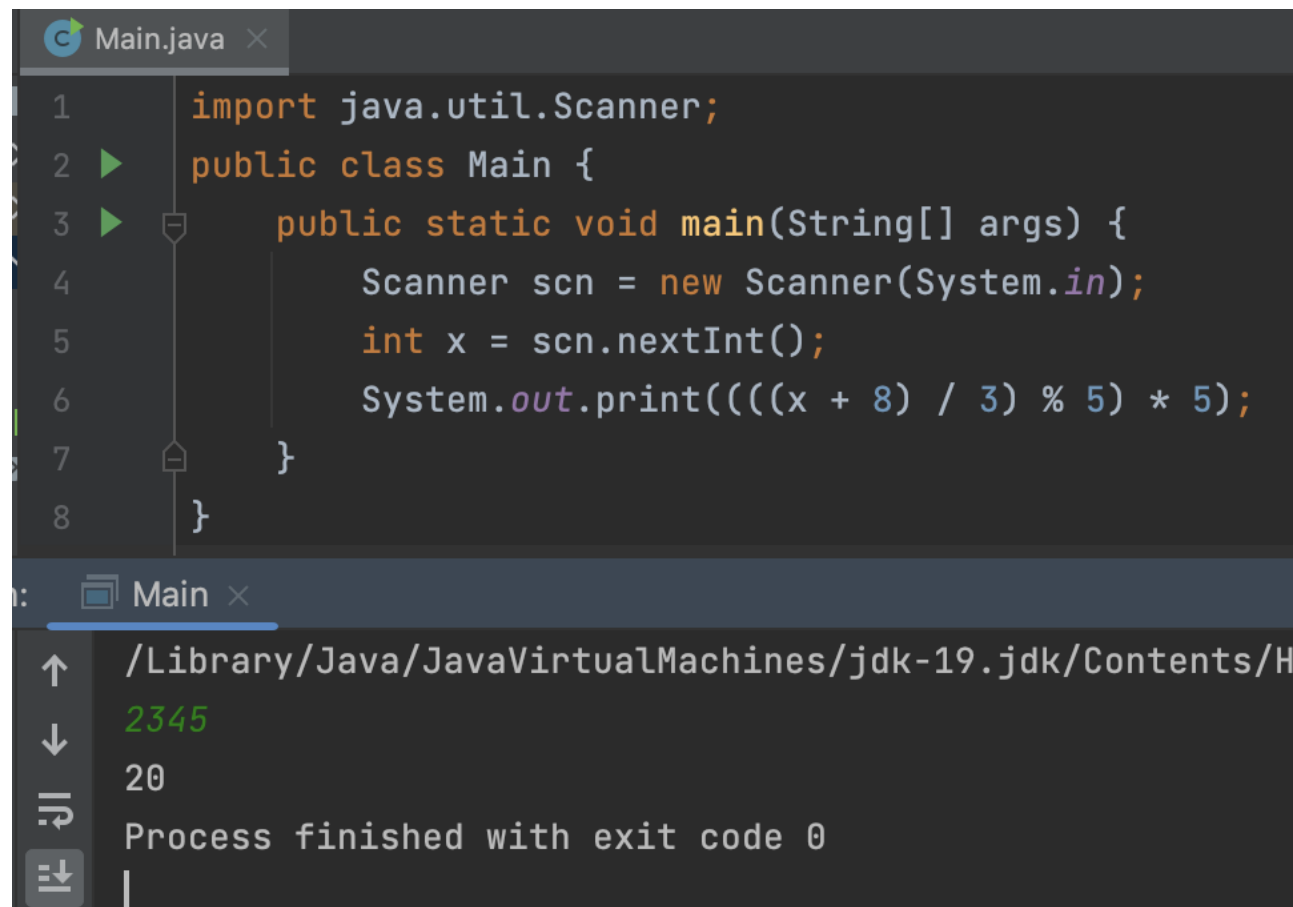
Q1 - Write a program to add 8 to the number x and then divide it by 3. Now, the modulus of the quotient is taken with 5 and then multiply the resultant value by 5. Display the final result.

Input: 2345
Output: 20

Code:
```java
import java.util.Scanner;
public class Main {
    public static void main(String[] args) {
        Scanner scn = new Scanner(System.in);
         int x = scn.nextInt();
        System.out.print((((x + 8) / 3) % 5) * 5);
    }
}
```

```
Main.java ✕
1       import java.util.Scanner;
2  ▶    public class Main {
3  ▶        public static void main(String[] args) {
4               Scanner scn = new Scanner(System.in);
5               int x = scn.nextInt();
6               System.out.print((((x + 8) / 3) % 5) * 5);
7           }
8       }
```

```
Main ✕
/Library/Java/JavaVirtualMachines/jdk-19.jdk/Contents/H
2345
20
Process finished with exit code 0
```
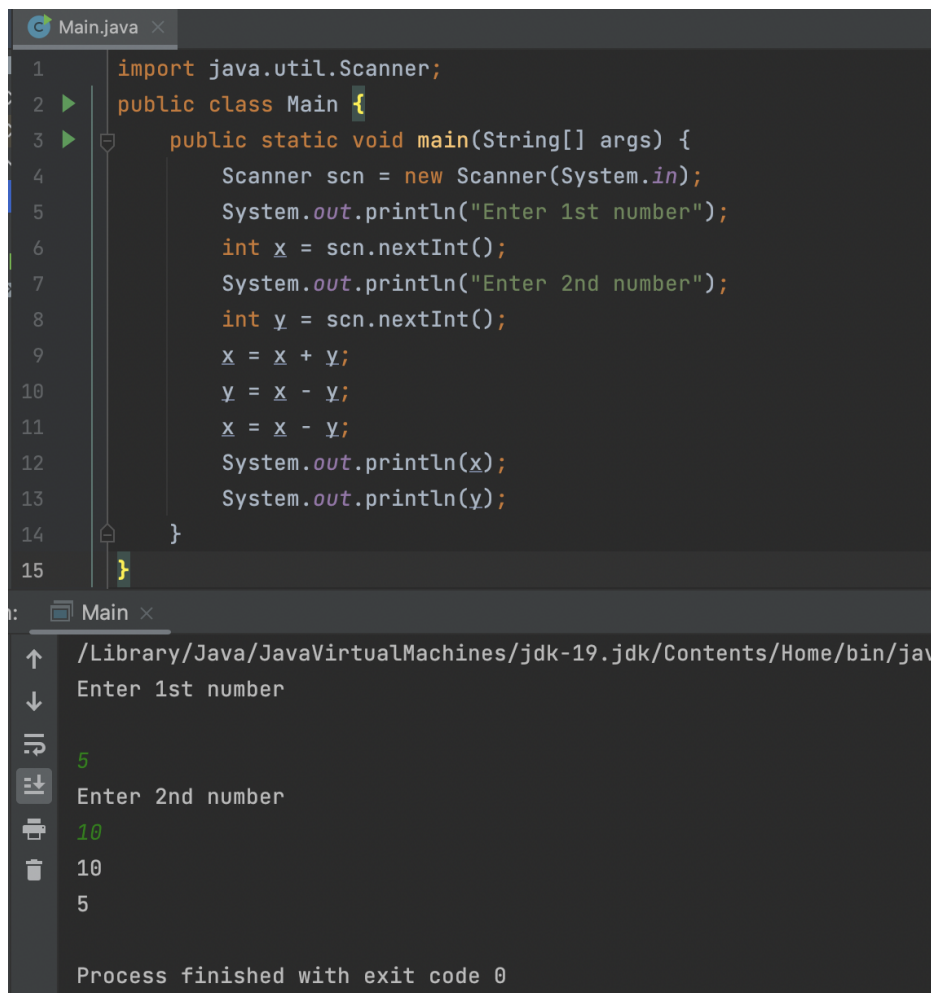
Q2 – Swap two numbers without the use of third variable.

Input: 5 10
Output: 10 5

Code:

```java
import java.util.Scanner;
public class Main {
    public static void main(String[] args) {
        Scanner scn = new Scanner(System.in);
        System.out.println("Enter 1st number");
        int x = scn.nextInt();
        System.out.println("Enter 2nd number");
        int y = scn.nextInt();
        x = x + y;
        y = x - y;
        x = x - y;
        System.out.println(x);
        System.out.println(y);
    }
}
```

```java
1    import java.util.Scanner;
2 ▶  public class Main {
3 ▶      public static void main(String[] args) {
4            Scanner scn = new Scanner(System.in);
5            System.out.println("Enter 1st number");
6            int x = scn.nextInt();
7            System.out.println("Enter 2nd number");
8            int y = scn.nextInt();
9            x = x + y;
10           y = x - y;
11           x = x - y;
12           System.out.println(x);
13           System.out.println(y);
14       }
15   }
```

Main ×

```
/Library/Java/JavaVirtualMachines/jdk-19.jdk/Contents/Home/bin/jav
Enter 1st number

5
Enter 2nd number
10
10
5

Process finished with exit code 0
```
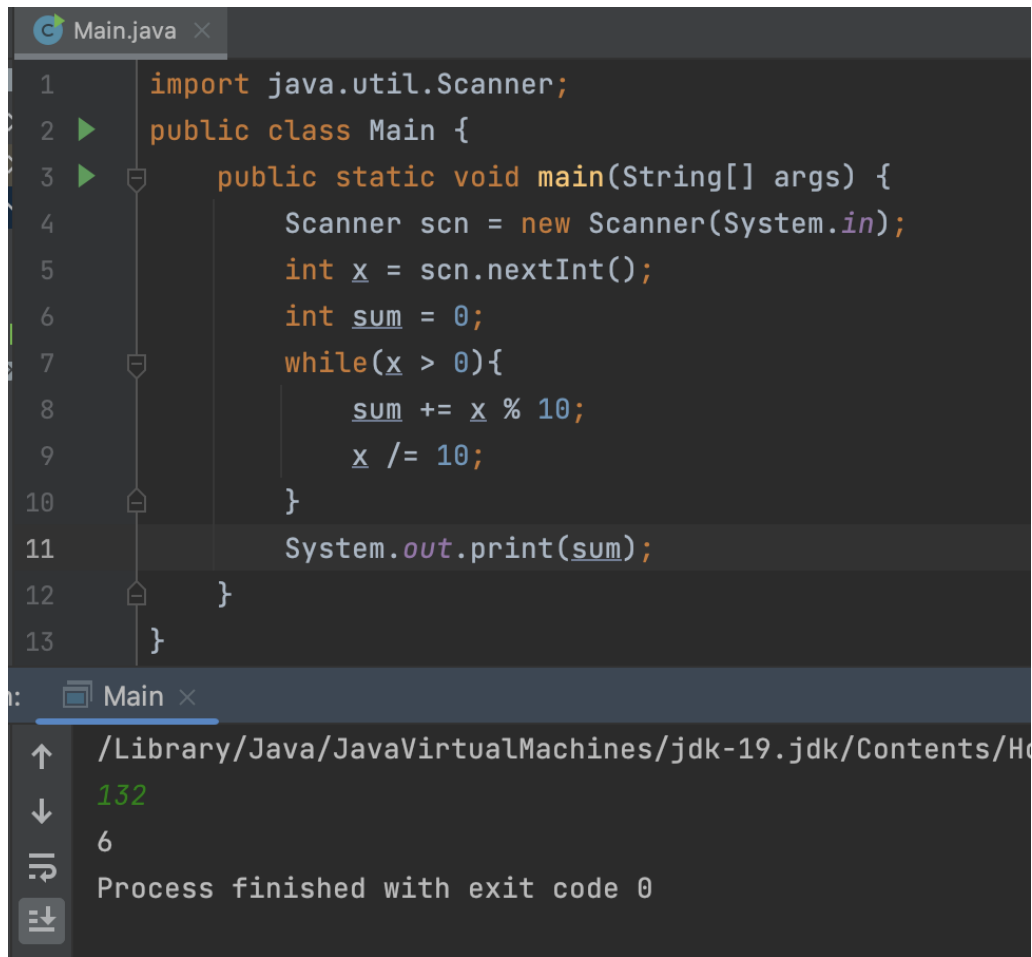
Q3 – Write a program to calculate the sum of the digits of a 3-digit number.

Input: 132
Output: 6

Code:

```java
import java.util.Scanner;
public class Main {
    public static void main(String[] args) {
        Scanner scn = new Scanner(System.in);
        int x = scn.nextInt();
        int sum = 0;
        while(x > 0){
            sum += x % 10;
            x /= 10;
}
        System.out.println(sum);
    }
}
```

```java
1       import java.util.Scanner;
2 ▶     public class Main {
3 ▶         public static void main(String[] args) {
4               Scanner scn = new Scanner(System.in);
5               int x = scn.nextInt();
6               int sum = 0;
7               while(x > 0){
8                   sum += x % 10;
9                   x /= 10;
10              }
11              System.out.print(sum);
12          }
13      }
```

```
Main ✕
↑   /Library/Java/JavaVirtualMachines/jdk-19.jdk/Contents/H
↓   132
    6
    Process finished with exit code 0
```
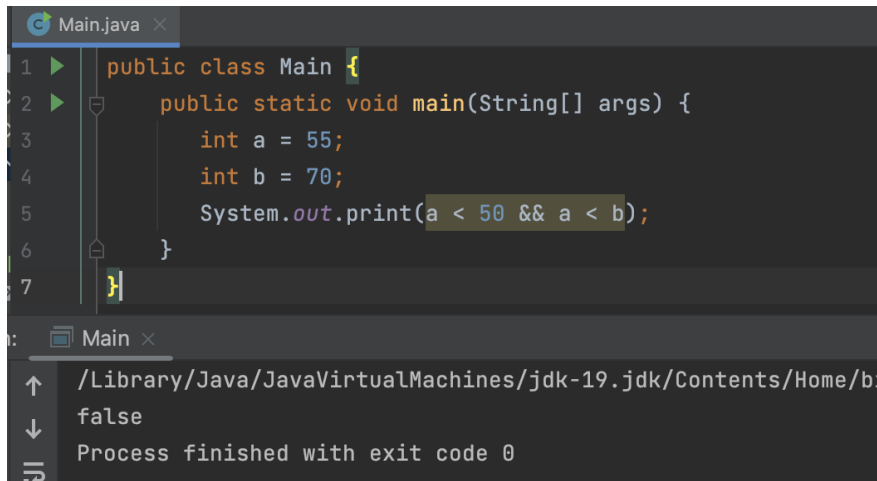
Q4 - Assign values of variables 'a' and 'b' as 55 and 70 respectively and then check if:

i) both the conditions 'a < 50' and 'a < b' are true.
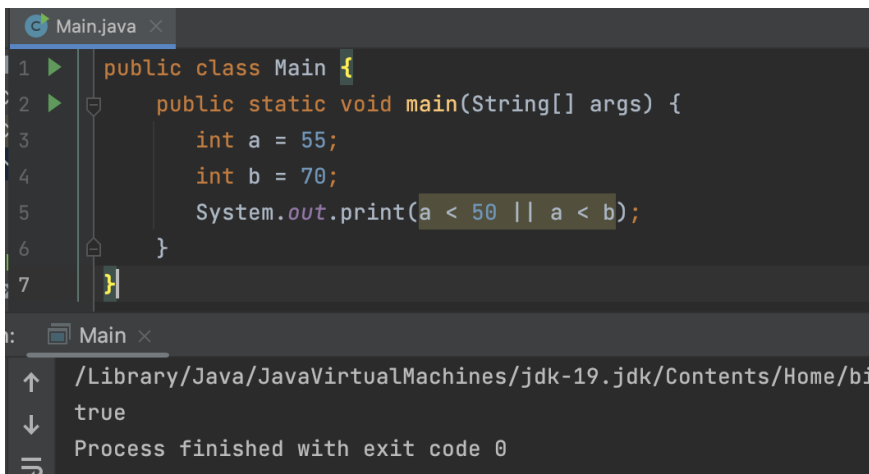ii) at least one of the conditions 'a < 50' or 'a < b' is true.

Code:

```java
public class Main {
    public static void main(String[] args) {
        int a = 55;
        int b = 70;
        System.out.print(a < 50 && a < b);
    }
}
```

```
Main.java
1  public class Main {
2      public static void main(String[] args) {
3          int a = 55;
4          int b = 70;
5          System.out.print(a < 50 && a < b);
6      }
7  }

Main
   /Library/Java/JavaVirtualMachines/jdk-19.jdk/Contents/Home/bi
   false
   Process finished with exit code 0
```

```java
public class Main {
    public static void main(String[] args) {
        int a = 55;
        int b = 70;
        System.out.print(a < 50 || a < b);
    }
}
```

```
Main.java
1  public class Main {
2      public static void main(String[] args) {
3          int a = 55;
4          int b = 70;
5          System.out.print(a < 50 || a < b);
6      }
7  }

Main
   /Library/Java/JavaVirtualMachines/jdk-19.jdk/Contents/Home/bi
   true
   Process finished with exit code 0
```

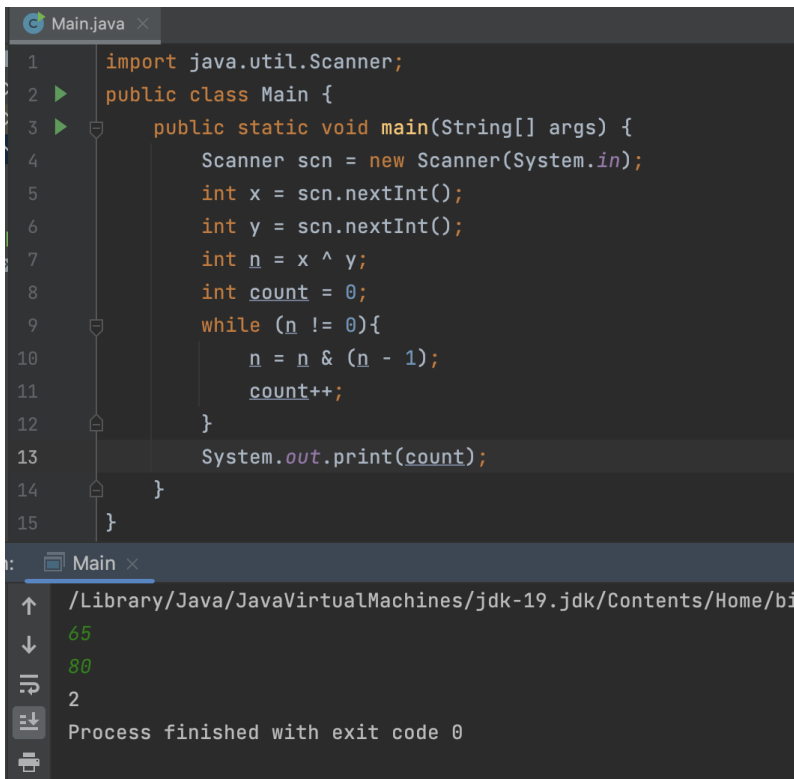**Q5 – Find the total number of bits needed to be flipped to convert x to y.**

Input: 65 80
Output: 2

The idea is to take XOR of the given two integers. After calculating the XOR, the problem will reduce to counting set bits in the XOR output using Brian Kernighan algorithm.

Code:

```java
import java.util.Scanner;
public class Main {
    public static void main(String[] args) {
        Scanner scn = new Scanner(System.in);
        int x = scn.nextInt();
        int y = scn.nextInt();
        int n = x ^ y;
        int count = 0;
        while (n != 0){
            n = n & (n - 1);
            count++;
        }
        System.out.print(count);
    }
}
```

```
Main.java
1      import java.util.Scanner;
2      public class Main {
3          public static void main(String[] args) {
4              Scanner scn = new Scanner(System.in);
5              int x = scn.nextInt();
6              int y = scn.nextInt();
7              int n = x ^ y;
8              int count = 0;
9              while (n != 0){
10                 n = n & (n - 1);
11                 count++;
12             }
13             System.out.print(count);
14         }
15     }

Main
/Library/Java/JavaVirtualMachines/jdk-19.jdk/Contents/Home/bi
65
80
2
Process finished with exit code 0
```