Intro to Java Programming

Calculating with Numbers

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Outline

Topic

Calculating with Numbers

Precedence and Parenthesis

Parenthesis are an easy way to control flow of operations

Code

```
1 int calculationWithParens = (1 + 1) + 3 * (2 + 5);
2 System.out.println(calculationWithParens);
3
4 int calculationWithoutParens = 1 + 1 + 3 * 2 + 5;
5 System.out.println(calculationWithoutParens);
```

```
> 23
> 13
```

Results

Programming Exercise - Seconds in a day

Part01_16.SecondsInADay

In the exercise template, implement a program that asks the user for the number of days. After that, the program prints the number of seconds in the given number of days.

Code

```
1  import java.util.Scanner;
2
3  public class SecondsInADay {
4
5      public static void main(String[] args) {
6          Scanner scanner = new Scanner(System.in);
7
8          // Write your program here
9
10     }
11 }
```

Desired Output

```
> How many days would you
      like to convert to
      seconds?
> 1
> 86400
```

Results

Desired Output

```
> How many days would you
      like to convert to
      seconds?
> 3
> 259200
```

Results

Expressions and Statements

```
int calculationWithoutParentheses = 1 + 1 + 3 * 2 + 5;
```

```
double value = Double.valueOf(scanner.nextLine());
```

Performing Math in Print statements

Code

```
1 String sampleString = "The answer to everything is " + 42;
2 System.out.println(sampleString);
```

```
> The answer to everything is 42
```

Results

Performing Math in Print statements

Code

```
1 String sampleString = "The answer to everything is " + 42;
2 System.out.println(sampleString);
```

```
> The answer to everything is 42
```

Results

Code

```
1 System.out.println("Four: " + (2 + 2));
2 System.out.println("But! Twenty-two: " + 2 + 2);
```

```
> Four: 4
> But! Twenty-two: 22
```

Results

Programming Exercise - Sum of Two Numbers

Part01_17.SumOfTwoNumbers

Write a program that asks the user for two numbers. After this, the program prints the sum of the numbers given by the user. When you ask for multiple numbers, create a separate variable for each:

Code

```
1  import java.util.Scanner;
2
3  public class SumOfTwoNumbers {
4
5      public static void main(String[] args) {
6          Scanner scanner = new Scanner(System.in);
7
8          // Write your program here
9
10     }
11 }
```

Desired Output

```
> Give the first number:
> 8
> Give the second number:
> 3
> The sum of the numbers is
      11
```

Results

Programming Exercise - Sum of three numbers

Part01_19.SumofThreeNumbers

Write a program that asks the user for three numbers. After this the program prints the sum of the numbers given by the user.

Code

```
1  import java.util.Scanner;
2
3  public class SumOfThreeNumbers {
4
5      public static void main(String[] args) {
6          Scanner scanner = new Scanner(System.in);
7
8          // Write your program here
9
10     }
11 }
```

Desired Output

```
> Give the first number:
> 8
> Give the second number:
> 3
> Give the third number:
> 3
> The sum of the numbers is
      14
```

Results

Programming Exercise - Addition formula

Part01_19.AdditionFormula

Create a program that can be used to add two integers together. In the beginning, the user is asked to give two integers that are to be summed. The program then prints the formula that describes the addition of the numbers.

Code

```
1  import java.util.Scanner;
2
3  public class AdditionFormula {
4
5      public static void main(String[] args) {
6          Scanner scanner = new Scanner(System.in);
7
8          // write your program here
9
10     }
11 }
```

Desired Output

```
> Give the first number:
> 5
> Give the second number:
> 4
> 5 + 4 = 9
```

Results

Programming Exercise - Multiplication Formula

Part01_20.MultiplicationFormula

Similar to the previous exercise, create a program that

multiplies the values stored in two integer variables.

Code

```
1  import java.util.Scanner;
2
3  public class MultiplicationFormula {
4
5      public static void main(String[] args) {
6          Scanner scanner = new Scanner(System.in);
7
8          // Write your program here
9
10     }
11 }
12
```

Desired Output

```
> Give the first number:
> 2
> Give the second number:
> 8
> 2 * 8 = 16
```

Results

Division

Integer dividend and divisor result in integer quotients

Integer divided by integer results in an integer

Code

```
1 int result = 3 / 2;
2 System.out.println(result);
```

```
> 1
```

Results

Code

```
1 int dividend = 2;
2 int divisor = 3;
3 double quotient = divisor / dividend;
4 System.out.println(quotient);
```

```
> 1.0
```

Results

Narrative

Division of integers is slightly trickier. If all the variables in the division expression are integers, then the resulting value will be an

Greater Division Accuracy

A double results in greater precision

Code

```
1 double dividend = 2.0;
2 int divisor = 3;
3 double quotient = divisor / dividend;
4 System.out.println(quotient);
```

```
> 1.5
```

Results

Casting

Code

```
1 int divisor = 3;
2 int dividend = 2;
3
4 double result1 = (double) divisor / dividend;
5 System.out.println(result1);
6 double result2 =  divisor / (double) dividend;
7 System.out.println(result2);
8 double result3 = (double) (divisor /
↪  dividend);
9 System.out.println(result3);
```

```
> 1.5
> 1.5
> 1.0
```

Results

Code

```
1 int dividend = 3;
2 int divisor = 2;
3
4 double result = 1.0 * dividend / divisor;
5 System.out.println(result);
```

```
> 1.5
```

Results

Code

```
1 int dividend = 3;
2 int divisor = 2;
3
4 double result = dividend / divisor * 1.0;
5 System.out.println(result);
```

```
> 1.0
```

Results

Programming Exercise - Average of Two Numbers

Part01_21.AverageOfTwoNumbers

Write a program that asks the user for two integers and prints their average.

Code

```
1  import java.util.Scanner;
2
3  public class AverageOfTwoNumbers {
4
5      public static void main(String[] args) {
6          Scanner scanner = new Scanner(System.in);
7
8          // Write your program here
9
10     }
11 }
12
```

Desired Output

```
> Give the first number:
> 8
> Give the second number:
> 2
> The average is 5.0
```

Results

Programming Exercise - Average of Three Numbers

Part01_22.AverageofThreeNumbers

Write a program that asks the user for three integers and

prints their average.

Code

```
1  import java.util.Scanner;
2
3  public class AverageOfThreeNumbers {
4
5      public static void main(String[] args) {
6          Scanner scanner = new Scanner(System.in);
7
8          // Write your program here
9
10     }
11 }
12
```

Desired Output

```
> Give the first number:
> 8
> Give the second number:
> 2
> Give the third number:
> 3
> The average is
      4.333333333333333
```

Results

Programming Exercise - Simple Calculator

Part01_23.SimpleCalculator

Write a program that asks the user for two numbers and prints their sum, difference, product, and quotient. Two examples of the execution of the program are given below.

Code

```
1  import java.util.Scanner;
2
3  public class SimpleCalculator {
4
5      public static void main(String[] args) {
6          Scanner scanner = new Scanner(System.in);
7
8          // Write your program here
9
10     }
11 }
```

Desired Output

```
> Give the first number:
> 8
> Give the second number:
> 2
> 8 + 2 = 10
> 8 - 2 = 6
> 8 * 2 = 16
> 8 / 2 = 4.0
```

Results