Lab: Methods

Problems for in-class lab for the "C# Fundamentals" course @ SoftUni

You can check your solutions in Judge

I. Declaring and Invoking Methods

1. Sign of Integer Numbers

Create a method that prints the **sign** of an integer number **n**:

Examples

Input	Output
2	The number 2 is positive.
-5	The number -5 is negative.
0	The number 0 is zero.

2. Grades

Write a method that **receives a grade** between **2.00** and **6.00** and **prints the corresponding grade in words**

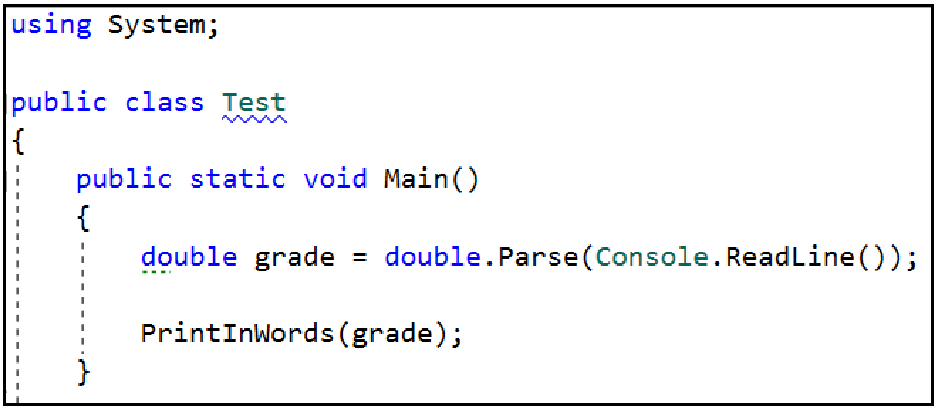
- 2.00 – 2.99 - "Fail"
- 3.00 – 3.49 - "Poor"
- 3.50 – 4.49 - "Good"
- 4.50 – 5.49 - "Very good"
- 5.50 – 6.00 - "Excellent"

Examples

Input	Output
3.33	Poor
4.50	Very good
2.99	Fail

Hints

1. Read the grade from the console and pass it to a method

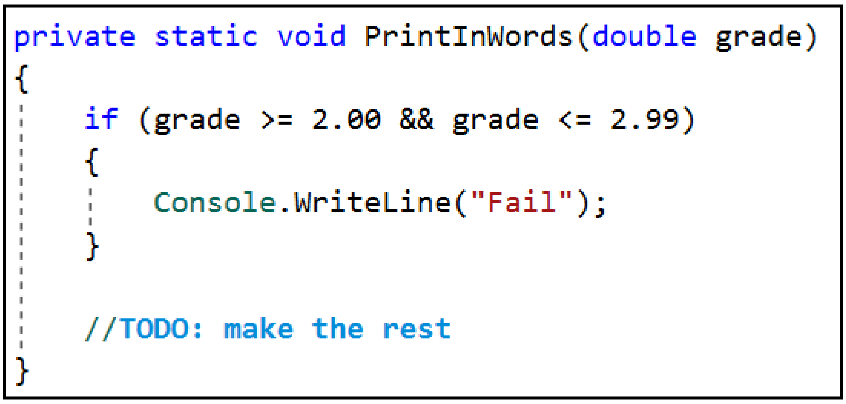


```
using System;

public class Test
{
    public static void Main()
    {
        double grade = double.Parse(Console.ReadLine());

        PrintInWords(grade);
    }
```

2. Then create the method and make the if statements for each case



```
private static void PrintInWords(double grade)
{
    if (grade >= 2.00 && grade <= 2.99)
    {
        Console.WriteLine("Fail");
    }

    //TODO: make the rest
}
```

3. Calculations

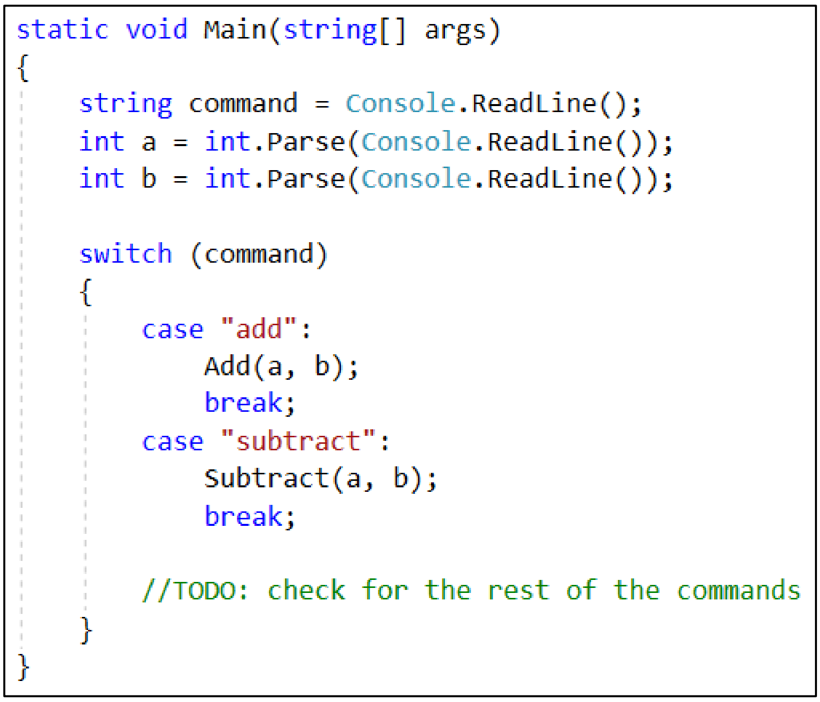
Write a program that receives a string on the first line (add, multiply, subtract, divide) and on the next two lines receives two numbers. Create four methods (for each calculation) and invoke the right one depending on the command. The method should also print the result (needs to be void)

Example

Input	Output
subtract 5 4	1
divide 8 4	2

Hints

1. Read the command on the first line and the two numbers, and then make an if/switch statement for each type of calculation

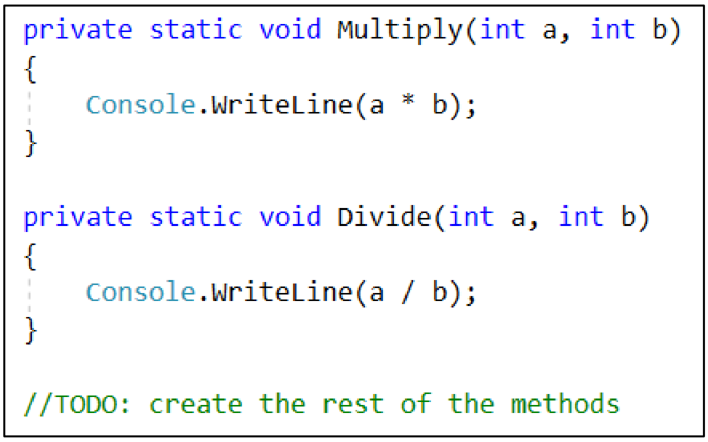


```
static void Main(string[] args)
{
    string command = Console.ReadLine();
    int a = int.Parse(Console.ReadLine());
    int b = int.Parse(Console.ReadLine());

    switch (command)
    {
        case "add":
            Add(a, b);
            break;
        case "subtract":
            Subtract(a, b);
            break;

        //TODO: check for the rest of the commands
    }
}
```

2. Then create the four methods and print the result



```
private static void Multiply(int a, int b)
{
    Console.WriteLine(a * b);
}

private static void Divide(int a, int b)
{
    Console.WriteLine(a / b);
}

//TODO: create the rest of the methods
```

4. Printing Triangle

Create a method for printing triangles as shown below:

Examples

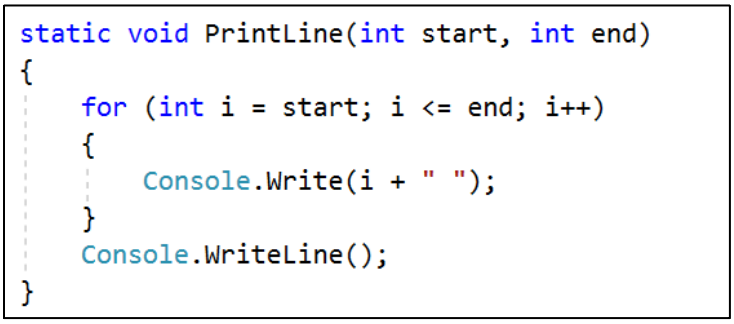
Input	Output

3	1
	1 2
	1 2 3
	1 2
	1

4	1
	1 2
	1 2 3
	1 2 3 4
	1 2 3
	1 2
	1

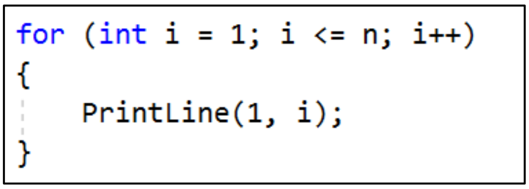
Hints

1. After you read the input
2. Start by creating a method **for printing a single line** from a **given start** to a **given end**. Choose a **meaningful name** for it, describing its purpose:



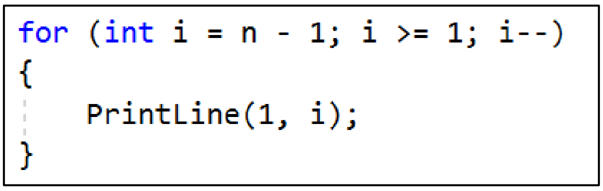
```
static void PrintLine(int start, int end)
{
    for (int i = start; i <= end; i++)
    {
        Console.Write(i + " ");
    }
    Console.WriteLine();
}
```

3. Create another method for printing the whole triangle. Again choose a **meaningful name** for it, describing its purpose.
4. Think how you can use the **PrintLine()** method to solve the problem
5. After you spent some time thinking, you should have come to the conclusion that you will need two loops
6. In the first loop you can print the first half of the triangle:



```
for (int i = 1; i <= n; i++)
{
    PrintLine(1, i);
}
```

7. In the second loop you can print the second half of the triangle:



```
for (int i = n - 1; i >= 1; i--)
{
    PrintLine(1, i);
}
```

5. Orders

Write a method that calculates the total price of an order and prints it on the console. The method should receive one of the following products: coffee, coke, water, snacks; and a quantity of the product. The prices for a single piece of each product are:

- coffee – 1.50
- water – 1.00
- coke – 1.40
- snacks – 2.00

Print the result formatted to the second decimal place

Example

Input	Output
water 5	5.00
coffee 2	3.00

Hints

1. Read the first two lines
2. Create a method the pass the two variables in
3. Print the result in the method

II. Returning Values and Overloading

6. Calculate Rectangle Area

Create a method that calculates and **returns** the area of a rectangle by given width and height:

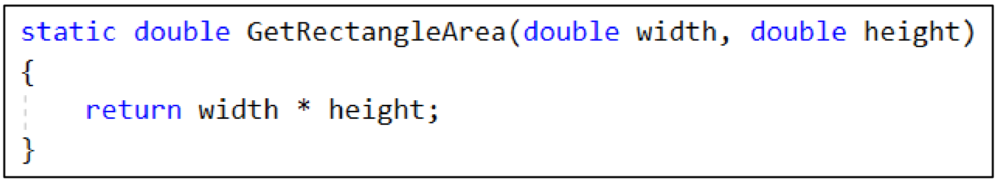
Examples

Input	Output
3	12

4	
6 2	12

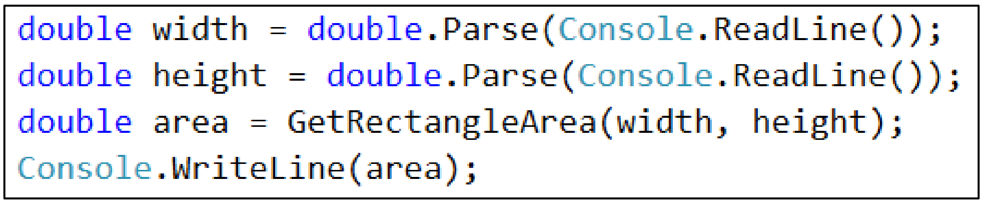
Hints

1. After reading the input
2. Create a method, but this time **instead** of typing **"static void"** before its name, type **"static double"** as this will make it to **return a value of type double**:



```
static double GetRectangleArea(double width, double height)
{
    return width * height;
}
```

3. **Invoke** the method in the main and **save the return value in a new variable**:



```
double width = double.Parse(Console.ReadLine());
double height = double.Parse(Console.ReadLine());
double area = GetRectangleArea(width, height);
Console.WriteLine(area);
```

7. Repeat String

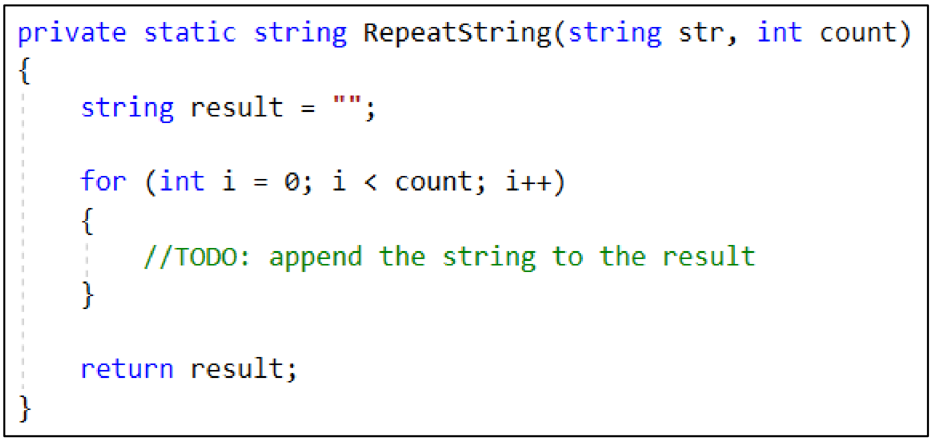
Write a method that receives a string and a repeat count n (integer). The method should return a new string (the old one repeated n times)

Example

Input	Output
abc 3	abcabcabc
String 2	StringString

Hints

1. Firstly read the **string** and the repeat count **n**
2. Then create the method and pass it the variables



```
private static string RepeatString(string str, int count)
{
    string result = "";

    for (int i = 0; i < count; i++)
    {
        //TODO: append the string to the result
    }

    return result;
}
```

3. In the main method, print the result

8. Math Power

Create a method that calculates and returns the value of a number raised to a given power:

Examples

Input	Output
2 8	256
3 4	81

Hints

1. As usual, read the input
2. Create a method which will have two parameters - the number and the power, and will return a result of type double:

```
static double RaiseToPower(double number, int power)
{
    double result = 0d;

    // TODO: Calculate result (use a loop, or Math.Pow())

    return result;
}
```

3. Print the result

9. Greater of Two Values

Create a method **GetMax()** that **returns the greater** of two values (the values can be of type **int**, **char** or **string**)

Examples

Input	Output
int 2 16	16
char a z	z
string aaa bbb	bbb

10. Multiply Evens by Odds

Create a program that **multiplies the sum** of **all even digits** of a number **by the sum of all odd digits** of the same number:

- Create a method called **GetMultipleOfEvenAndOdds()**
- Create a method **GetSumOfEvenDigits()**
- Create **GetSumOfOddDigits()**
- You may need to use **Math.Abs()** for negative numbers

Examples

Input	Output	Comment
-12345	54	Evens: 2 4 Odds: 1 3 5 Even sum: 6 Odd sum: 9 6 * 9 = 54

11. Math operations

Write a method that receives two number and an operator, calculates the result and returns it. You will be given three lines of input. The first will be the first number, the second one will be the operator and the last one will be the second number. The possible operators are: / * + -

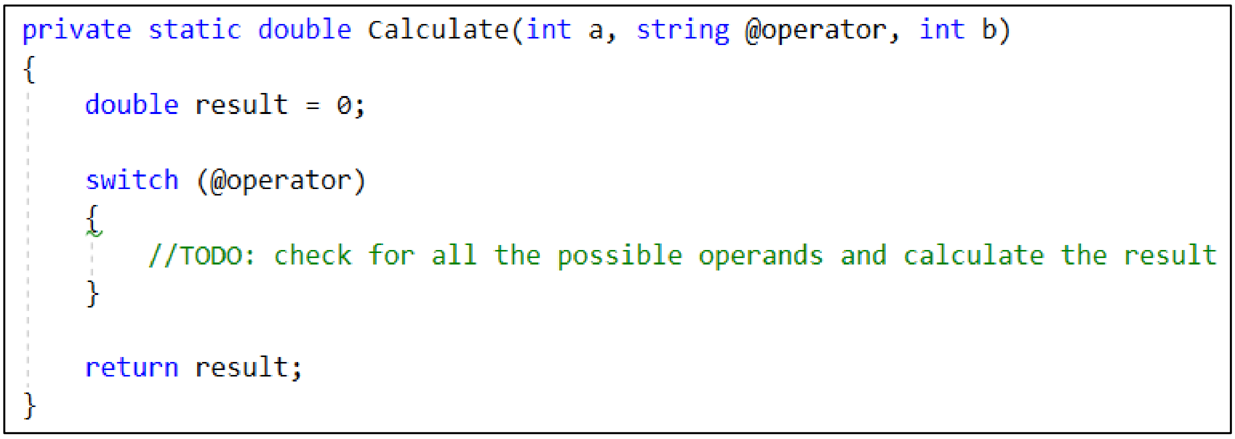
Print the result rounded up to the second decimal point.

Example

Input	Output
5 * 5	25
4 + 8	12

Hint

1. Read the inputs and create a method that returns a double (the result of the operation)



```
private static double Calculate(int a, string @operator, int b)
{
    double result = 0;

    switch (@operator)
    {
        //TODO: check for all the possible operands and calculate the result
    }

    return result;
}
```