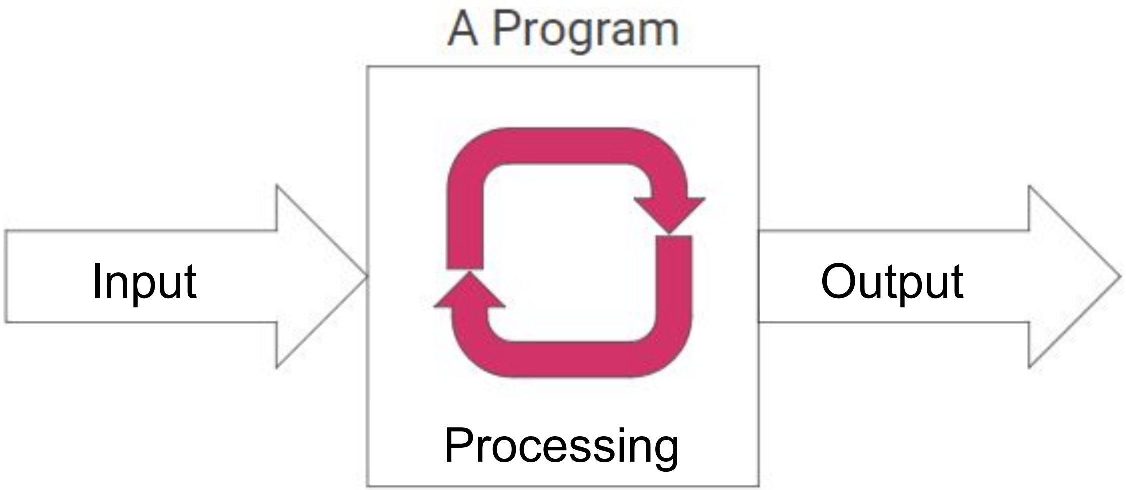
Review for Test #1

Topics for the Test

- How a program works
- Variables, expressions, statements
- Branching

How Programs Work



A Program

Input

Processing

Output

Some New Operators

```
int total = 10;

total = total + 50;     total += 50;
total = total * 2;      total *= 2;
total = total + 1;      total += 1;
                        total++;
total = total - 1;      total -= 1;
                        total--;
```

Statements

```
int number1 = Convert.ToInt32(textBox1.Text);
int number2 = Convert.ToInt32(textBox2.Text);
int newNumber = 13 + number1 * (number2 / 5);
if (newNumber > 5 && newNumber < 20)
{
    answer.Text = "The answer is " + newNumber;
}
```

Expressions

```
int number1 = Convert.ToInt32(textBox1.Text);
int number2 = Convert.ToInt32(textBox2.Text);
int newNumber = 13 + number1 * (number2 / 5);
if (newNumber > 5 && newNumber < 20)
{
    answer.Text = "The answer is " + newNumber;
}
```

Operators

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if (newNumber > 5 && newNumber < 20)
{
    answer.Text = "The answer is " + newNumber;
}
```

Operator Types

Arithmetic	Assignment	Comparison	Logical
+	=	==	&&
-		!=	||
*		<	!
/		<=	
%		>	
		>=	

Expressions

int answer = 42;   int score = 10;   int cost = 7;   string name = "Paul";

Expression	**Type**	**Value**
answer + 5	__________	_______________
13	__________	_______________
score – cost	__________	_______________
answer * score	__________	_______________
7 / 3	__________	_______________
7 % 3	__________	_______________
int total;	__________	_______________

Expressions

int answer = 42; int score = 10; int cost = 7; string name = "Paul";

Expression	Type	Value
"hello " + name		
score == 8		
cost != 8		
answer > 15		
cost > 5 && cost < 10		
score == 4 || cost == 7		
playerName + score		

Errors

- Syntax
  - Program won’t build - problem in C# code
- Run-time
  - Program crashes / fails while running
- Logical
  - Program runs but does the wrong thing

Variables

Four properties

- Name
- Type
- Value
- Scope

```
public partial class Form1 : Form
{
    private string name;
    private int myNumber;

...

    private void buttonStart_Click(object sender, EventArgs e)
    {
        Random random;
        random = new Random();
        myNumber = random.Next(100);
        name = textBox1.Text;
        message.Text = "All right, " + name + ", guess my number.";
    }

    private void buttonGuess_Click(object sender, EventArgs e)
    {
        int guess = Convert.ToInt32(textBox1.Text);
        if (guess < myNumber)
        {
            string m = "Sorry, " + name + ", that's too low.";
            message.Text = m;
        }
```

Variables

Four properties

- Name
- Type
- Value
- Scope

```
public partial class Form1 : Form
{
...
    private void buttonGuess_Click(object sender, EventArgs e)
    {
        int guess = Convert.ToInt32(textBox1.Text);
        if (guess < myNumber)
        {
            string m = "Sorry, " + name + ", that's too low.";
            message.Text = m;
        }
        else if (guess > myNumber)
        {
            string m = "Sorry, " + name + ", that's too high.";
            message.Text = m;
        }
        else
        {
            message.Text = name + " guessed my number!";
        }
    }
}
```

Variable Naming Rules

- Syntax rules (cause errors if not followed)
- Conventions (cause confusion if not followed)

a	playerName	toast	RemRolls
x5hDy2	3bonus	isSaved	height
textMessage	add_output	Count	total
numPnt$	value3	x	find
Money	hasPotion	livLeft	go-home

Branching

```
string s = "letters: ";
if (x < y)
{
  if (x > 5)
  {
    s += "A";
  }
  else if (y > 5)
  {
    s += "B";
  }
  else
  {
    s += "C";
  }
}
else
{
  if (x > 5)
  {
    s += "D";
  }
  if (y > 5)
  {
    s += "E";
  }
  else
  {
    s += "F";
  }
}
```

x = 10, y = 20

x = 20, y = 10

Test Helps

- Worksheets
- Assignments
- Study Guides
- Slides