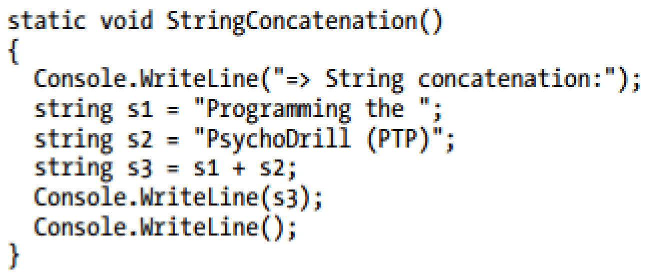
Strings

Working with strings

- System.String contains an enormous amount of options to work with strings
  - Length
  - Compare
  - Contains
  - Equals
  - Format
  - Insert
  - Trim
  - ToUpper
  - ToLower
  - Remove
  - Replace

String concatenation

- Strings can be concatenated using the + operator
  - Internally, this routes to the Concat() method



```
static void StringConcatenation()
{
  Console.WriteLine("=> String concatenation:");
  string s1 = "Programming the ";
  string s2 = "PsychoDrill (PTP)";
  string s3 = s1 + s2;
  Console.WriteLine(s3);
  Console.WriteLine();
}
```

Escape characters

- The escape character \ (a single backslash) signals to the compiler that the character following the backslash is not an normal character.

`\b`	**Backspace BS**
`\t`	**Horizontal tab HT**
`\n`	**Linefeed LF**
`\f`	**Form feed FF**
`\r`	**Carriage return CR**
`\"`	**Double quote "**
`\a`	**Alarm (beep)**
`\\`	**A single backslash \\**
`\0`	**null character**

Verbatim Strings

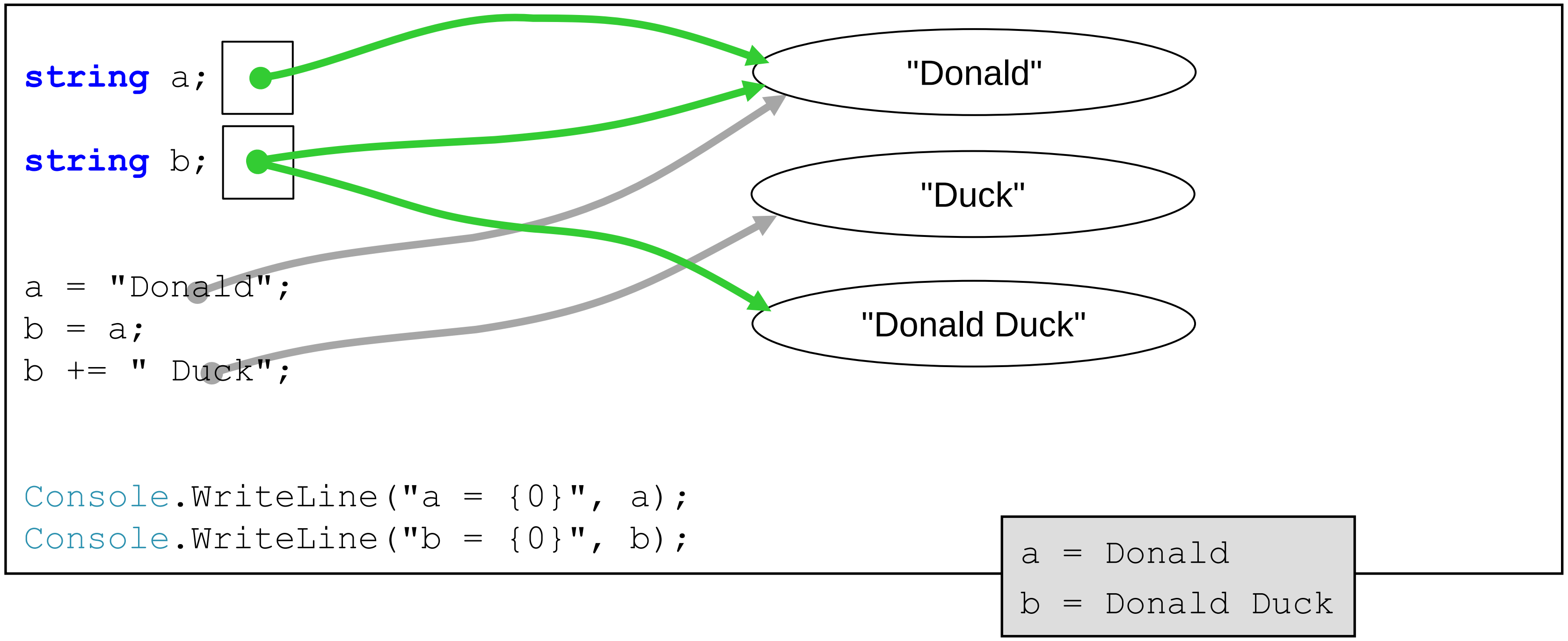
- @ tells the compiler that the following string should not be escaped
  - Meaning no special processing of the \ character

```
string a = @"c:\temp\newfile.txt";
    //versus

string b = "c:\\temp\\newfile.txt";
```

Comparing strings

- Strings are reference types
- BUT: == and != compare the references, not the values for reference types



```
string a;
string b;

a = "Donald";
b = a;
b += " Duck";

Console.WriteLine("a = {0}", a);
Console.WriteLine("b = {0}", b);
```

```
a = Donald
b = Donald Duck
```

Strings are immutable

- Strings can’t be changed…
  - All methods make copies of the string you’re working with, including +
  - We always get back a new string instance
- Net result: string manipulation using the string class can be very inefficient
  - Only use for “small” operations
  - Avoid doing heavy string work in loops!
- The solution…?

StringBuilder

- .NET provides the StringBuilder (System.Text)
- Works with the “real” string, doesn’t make a copy
- Defines many constructors

Practicing StringBuilder

- Build a string with a StringBuilder.