Intro to C#

- In VS, a solution is a collection of projects
- Within one namespace, all classes must be uniquely named
- Bin stands for binary
- Sln files are written in XML
- XML contains metadata
- It is proper that private fields use an underscore for variable names
- Console commands come under the System namespace
- C# has implicit usings in the XML now
- Refactoring is making a program more legible and increasing its potential for extension
- Single Responsibility Principle = one unit of code (methods/classes) is only supposed to have one purpose
- Strongly typed languages mean you aren't able to change the type of a variable at runtime. This is not the case with dynamically typed languages. Strongly typed languages are more memory safe

Tests

- Arrange, Act, Assert are the three As of test structure
- There should be no logic in your tests–no logic, no conditions–just a single input/output block
- You can assert multiple times in a single test block
- You want to make tests that pass rather than fail, i.e. you want a test that has a successful, desirable outcome
- Equivalence partitions = the range in between the boundaries
- Boundary value analysis = find out where the boundaries of a program are and which you need to test
- Test Driven Development is a philosophy where code must be considered for testing before the code has even been written

Operators

- ^ is a binary operator that assesses whether two operands are the same value
- You can't do index operators like normal maths. You have to use PowerTo.() or manually times fields by themselves
- Postfix increment and prefix increment are functionally the same
- Prefix happens before assignment
- Postfix happens after

Exceptions

- Our tests should account for exceptions even before we start to code

- Statically typed: once variables are assigned a type they are declared, and this type cannot be changed

- Typesafe: able to perform certain implicit conversions but prevents incompatible conversions
- Memorysafe: can't access memory beyond the scope of an array. Not allowed
- We can only use var to declare a field if its field can be determined at runtime

Data Types

- Convert.ToInt64(num) is more accurate when casting from float to long than using the (long)float_name method.
- Bytes are considered unsigned by default but all else is signed
- Convert class is more likely to throw an exception so that you don't leak data

Strings

- 3.0:C is a formatting code to output as currency

Methods

- Method names typically have verb phrases
- Public is an access modifier
- Public, internal, protected, private in order of publicity
- Protected means that a parent's children can access its attributes. Can be accessed by a derived class
- Internal means that it can be accessed by the same assembly
- Camelcase variables, should be descriptive. Should be nouns
- Parameters are declarative, arguments are what you pass to parameters
- Static methods only belong to the class, not class instances
- Main method is internal by default
- You can make a parameter optional by providing it a default value
- Named parameters have been introduced to C#
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