Visual Studio and .NET Framework
CMS is up
  - Let me know if you are not in CMS
Office Hour
  - Friday after class until 2pm, 4161 Upson
The first assignment will be posted by Friday
  - Due next Friday
Three assignments in total
  - Released on Friday, due next Friday
Outline

- Visual C# 2008 Express walkthrough
- .Net framework, CLR, CTS
- C# language guide
Visual C# Express Walkthrough

- Use wizard to create a C# program
- Build and run
- Intellisense feature
- MSDN lookup
- Debug
.Net

- A Common Language Runtime (CLR)
  - Virtual Machine like Java
  - C# compiles into Common Intermediate Language
    - All .NET languages compile into CIL
    - e.g. C#, F#, VB.net, IronPython, etc.
  - CIL runs on CLR
- A Common Type System (CTS)
.Net Framework in Context
Common Language Runtime

Source code

- C#
- VB.NET
- Other .NET language

Compile time

Bytecode

CIL code

Runtime

C# compiler

VB.NET compiler

Other compiler

CLR

Native code

Native code
Common Language Runtime

- Base Class Library Support
- Thread Support
- COM Marshaler
- Type Checker
- Exception Manager
- Security Engine
- Debug Engine
- CIL to Native Compilers (JIT)
- Code Manager
- Garbage Collector (GC)
- Class Loader
A set of common types
- Any language that runs in the CLR should implement
- No syntax specified
- Languages often define type aliases

Examples
- CTS defines System.Int32 – 4 byte integer
- C# defines int as an alias of System.Int32
  - string → System.String
  - object → System.Object
Common Type System

- Type
  - Value types
    - Built-in value types
    - User-defined value types
    - Enumerations
  - Reference types
    - Pointer types
    - Interface types
    - Self-describing types
      - Arrays
      - Class types
        - User-Defined Classes
        - Boxed Value Types
        - Delegates
**C# Language Guide**

- **Assignment**
  - `<variable name> = <expression>`
    - `a = (1 + 4) * 5;`

- **If Statement**
  - `if (<condition>) {<statements>}`
    - `if (1 < 2) {a = 5;}`
  - `if (<condition>) {<statements>} else {<statements>}`
    - `if (1 > 2) {a = 5;} else {a = 10;}`
Loops

- **For loop**
  - for (<initialization>; <termination test>; <make progress>) {<statements>}
  - for (int i = 10; i > 0; i--) {Console.WriteLine(i);}

- **While loop**
  - while (<condition>) {<statements>}
  - while (i > 0) {Console.WriteLine(i); i--;}

- **Do-while loop**
  - do {<statements>} while (<condition>)
  - do {Console.WriteLine(i); i--;} while (i > 0);