INTRODUCING OUR LANGUAGE: C#

Topics

Topics

- The Features of C#

Topics

- **The Features of C#**
  - **C# is a Compiled Language**

Topics

- **The Features of C#**
  - **C# is a Compiled Language**
  - **C# is Managed Code**

Topics

- **The Features of C#**
  - C# is a Compiled Language
  - C# is Managed Code
  - C# is Strongly Typed

Topics

- The Features of C#
  - C# is a Compiled Language
  - C# is Managed Code
  - C# is Strongly Typed
  - C# is Function Based

Topics

- The Features of C#
  - C# is a Compiled Language
  - C# is Managed Code
  - C# is Strongly Typed
  - C# is Function Based
  - C# is Object-Oriented

Topics

- The Features of C#
  - C# is a Compiled Language
  - C# is Managed Code
  - C# is Strongly Typed
  - C# is Function Based
  - C# is Object-Oriented
- Reading and Understanding C# Syntax

Understanding the Features of C#

Understanding the Features of C#

- C# is a Compiled Language

Understanding the Features of C#

- **C# is a Compiled Language**
  - Computer chips only understand *machine language*

Understanding the Features of C#

- **C# is a Compiled Language**
  - **Computer chips only understand *machine language***
    - 000000 00001 00010 00110 00000 100000

Understanding the Features of C#

- **C# is a Compiled Language**
  - **Computer chips only understand *machine language***
    - 000000 00001 00010 00110 00000 100000
    - This is what punch cards were

Understanding the Features of C#

- **C# is a Compiled Language**
  - **Computer chips only understand *machine language***
    - 000000 00001 00010 00110 00000 100000
    - This is what punch cards were
  - ***Authoring languages* were created to be an intermediary language between humans and computers**

Understanding the Features of C#

- **C# is a Compiled Language**
  - **Computer chips only understand *machine language***
    - 000000 00001 00010 00110 00000 100000
    - This is what punch cards were
  - ***Authoring languages* were created to be an intermediary language between humans and computers**
  - **Two kinds of authoring languages:**

Understanding the Features of C#

- **C# is a Compiled Language**
  - **Computer chips only understand *machine language***
    - 000000 00001 00010 00110 00000 100000
    - This is what punch cards were
  - ***Authoring languages* were created to be an intermediary language between humans and computers**
  - **Two kinds of authoring languages:**
    - *Interpreted*

Understanding the Features of C#

- **C# is a Compiled Language**
  - **Computer chips only understand *machine language***
    - 000000 00001 00010 00110 00000 100000
    - This is what punch cards were
  - ***Authoring languages* were created to be an intermediary language between humans and computers**
  - **Two kinds of authoring languages:**
    - *Interpreted*
    - *Compiled*

Understanding the Features of C#

Understanding the Features of C#

- Interpreted Languages

Understanding the Features of C#

- **Interpreted Languages**
  - e.g., JavaScript, PHP, and Python

Understanding the Features of C#

- **Interpreted Languages**
  - e.g., JavaScript, PHP, and Python
  - Two-Step Process

Understanding the Features of C#

- **Interpreted Languages**
  - **e.g., JavaScript, PHP, and Python**
  - **Two-Step Process**
    - Programmer writes the code

Understanding the Features of C#

- **Interpreted Languages**
  - **e.g., JavaScript, PHP, and Python**
  - **Two-Step Process**
    - Programmer writes the code
    - An *interpreter* converts the code into machine language in real-time

Understanding the Features of C#

- **Interpreted Languages**
  - **e.g., JavaScript, PHP, and Python**
  - **Two-Step Process**
    - Programmer writes the code
    - An *interpreter* converts the code into machine language in real-time
  - **Benefits**

Understanding the Features of C#

- **Interpreted Languages**
  - **e.g., JavaScript, PHP, and Python**
  - **Two-Step Process**
    - Programmer writes the code
    - An *interpreter* converts the code into machine language in real-time
  - **Benefits**
    - **Portability**: Can run on any kind of computer as long as there's an interpreter

Understanding the Features of C#

- **Interpreted Languages**
  - **e.g., JavaScript, PHP, and Python**
  - **Two-Step Process**
    - Programmer writes the code
    - An *interpreter* converts the code into machine language in real-time
  - **Benefits**
    - **Portability**: Can run on any kind of computer as long as there's an interpreter
  - **Detriments**

Understanding the Features of C#

- **Interpreted Languages**
  - **e.g., JavaScript, PHP, and Python**
  - **Two-Step Process**
    - Programmer writes the code
    - An *interpreter* converts the code into machine language in real-time
  - **Benefits**
    - **Portability**: Can run on any kind of computer as long as there's an interpreter
  - **Detriments**
    - **Lack of Speed**: The processing power used to interpret the code is not spent on the game itself

Understanding the Features of C#

- **Interpreted Languages**
  - **e.g., JavaScript, PHP, and Python**
  - **Two-Step Process**
    - Programmer writes the code
    - An *interpreter* converts the code into machine language in real-time
  - **Benefits**
    - **Portability**: Can run on any kind of computer as long as there's an interpreter
  - **Detriments**
    - **Lack of Speed**: The processing power used to interpret the code is not spent on the game itself
    - **Lack of Efficiency**: Because the code can run on any computer, it's not optimized for any specific computer

Understanding the Features of C#

Understanding the Features of C#

- Compiled Languages

Understanding the Features of C#

- **Compiled Languages**
  - e.g., C#, Basic, Java, C++

Understanding the Features of C#

- **Compiled Languages**
  - e.g., C#, Basic, Java, C++
  - Three-Step Process

Understanding the Features of C#

- **Compiled Languages**
  - **e.g., C#, Basic, Java, C++**
  - **Three-Step Process**
    - Programmer writes the code

Understanding the Features of C#

- **Compiled Languages**
  - **e.g., C#, Basic, Java, C++**
  - **Three-Step Process**
    - Programmer writes the code
    - Programmer uses a compiler to convert the code into machine language

Understanding the Features of C#

- **Compiled Languages**
  - **e.g., C#, Basic, Java, C++**
  - **Three-Step Process**
    - Programmer writes the code
    - Programmer uses a compiler to convert the code into machine language
    - Computer executes the code

Understanding the Features of C#

- **Compiled Languages**
  - **e.g., C#, Basic, Java, C++**
  - **Three-Step Process**
    - Programmer writes the code
    - Programmer uses a compiler to convert the code into machine language
    - Computer executes the code
  - **Benefits**

Understanding the Features of C#

- **Compiled Languages**
  - **e.g., C#, Basic, Java, C++**
  - **Three-Step Process**
    - Programmer writes the code
    - Programmer uses a compiler to convert the code into machine language
    - Computer executes the code
  - **Benefits**
    - **Speed**: Computer spends more processor power on the game itself

Understanding the Features of C#

- **Compiled Languages**
  - **e.g., C#, Basic, Java, C++**
  - **Three-Step Process**
    - Programmer writes the code
    - Programmer uses a compiler to convert the code into machine language
    - Computer executes the code
  - **Benefits**
    - **Speed**: Computer spends more processor power on the game itself
    - **Efficiency**: Code is optimized for a specific processor architecture

Understanding the Features of C#

- **Compiled Languages**
  - **e.g., C#, Basic, Java, C++**
  - **Three-Step Process**
    - Programmer writes the code
    - Programmer uses a compiler to convert the code into machine language
    - Computer executes the code
  - **Benefits**
    - **Speed**: Computer spends more processor power on the game itself
    - **Efficiency**: Code is optimized for a specific processor architecture
  - **Detriments**

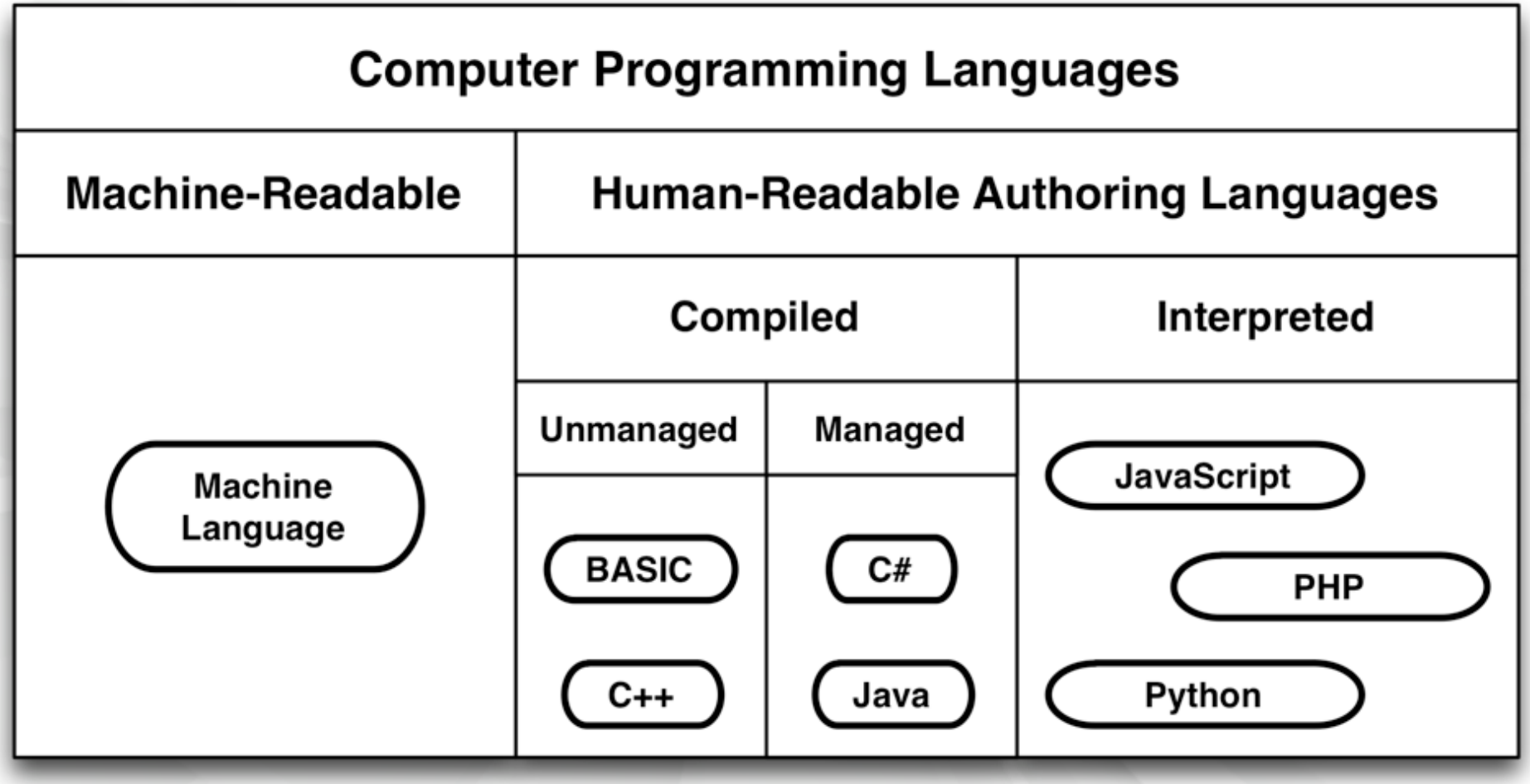
Understanding the Features of C#

- **Compiled Languages**
  - **e.g., C#, Basic, Java, C++**
  - **Three-Step Process**
    - Programmer writes the code
    - Programmer uses a compiler to convert the code into machine language
    - Computer executes the code
  - **Benefits**
    - **Speed**: Computer spends more processor power on the game itself
    - **Efficiency**: Code is optimized for a specific processor architecture
  - **Detriments**
    - **Lack of Portability**: Compiled for only one kind of machine

Understanding the Features of C#

- **Compiled Languages**
  - **e.g., C#, Basic, Java, C++**
  - **Three-Step Process**
    - Programmer writes the code
    - Programmer uses a compiler to convert the code into machine language
    - Computer executes the code
  - **Benefits**
    - **Speed**: Computer spends more processor power on the game itself
    - **Efficiency**: Code is optimized for a specific processor architecture
  - **Detriments**
    - **Lack of Portability**: Compiled for only one kind of machine
    - **Extra Compilation Step**

Understanding the Features of C#



Hierarchy of Computer Languages

Understanding the Features of C#

Understanding the Features of C#

- C# is *Managed Code*

Understanding the Features of C#

- **C# is *Managed Code***
  - **Computers have a limited amount of Random Access Memory (RAM)**

Understanding the Features of C#

- **C# is *Managed Code***
  - **Computers have a limited amount of Random Access Memory (RAM)**
  - **Older compiled languages like BASIC and C++ require the programmer to manually allocate and deallocate RAM**

Understanding the Features of C#

- **C# is *Managed Code***
  - Computers have a limited amount of Random Access Memory (RAM)
  - Older compiled languages like BASIC and C++ require the programmer to manually allocate and deallocate RAM
  - In *managed code*, allocation and deallocation are handled automatically

Understanding the Features of C#

- **C# is *Managed Code***
  - **Computers have a limited amount of Random Access Memory (RAM)**
  - **Older compiled languages like BASIC and C++ require the programmer to manually allocate and deallocate RAM**
  - **In *managed code*, allocation and deallocation are handled automatically**
  - **This makes it less likely that you will accidentally claim all of the memory**

Understanding the Features of C#

- **C# is *Managed Code***
  - **Computers have a limited amount of Random Access Memory (RAM)**
  - **Older compiled languages like BASIC and C++ require the programmer to manually allocate and deallocate RAM**
  - **In *managed code*, allocation and deallocation are handled automatically**
  - **This makes it less likely that you will accidentally claim all of the memory**
    - Doing so is known as a "memory leak"

VARIABLES IN COMPUTER LANGUAGES

VARIABLES IN COMPUTER LANGUAGES

- A variable is a name that can hold a value

VARIABLES IN COMPUTER LANGUAGES

- A variable is a name that can hold a value
- This concept is borrowed from algrbra

VARIABLES IN COMPUTER LANGUAGES

- A variable is a name that can hold a value
- This concept is borrowed from algrbra
  - x = 5

VARIABLES IN COMPUTER LANGUAGES

- A variable is a name that can hold a value
- This concept is borrowed from algrbra
  - x = 5
  - x + 2 = ?

VARIABLES IN COMPUTER LANGUAGES

- A variable is a name that can hold a value
- This concept is borrowed from algrbra
  - x = 5
  - x + 2 = ?
- Variables in computer languages can hold much more than just simple numbers

VARIABLES IN COMPUTER LANGUAGES

- A variable is a name that can hold a value
- This concept is borrowed from algrbra
  - x = 5
  - x + 2 = ?
- Variables in computer languages can hold much more than just simple numbers
  - Numbers

VARIABLES IN COMPUTER LANGUAGES

- A variable is a name that can hold a value
- This concept is borrowed from algrbra
  - x = 5
  - x + 2 = ?
- Variables in computer languages can hold much more than just simple numbers
  - Numbers
  - Words, sentences, paragraphs, novels…

VARIABLES IN COMPUTER LANGUAGES

- A variable is a name that can hold a value
- This concept is borrowed from algrbra
  - x = 5
  - x + 2 = ?
- Variables in computer languages can hold much more than just simple numbers
  - Numbers
  - Words, sentences, paragraphs, novels…
  - Images, sounds, 3D models, animations…

VARIABLES IN COMPUTER LANGUAGES

- A variable is a name that can hold a value
- This concept is borrowed from algrbra
  - x = 5
  - x + 2 = ?
- Variables in computer languages can hold much more than just simple numbers
  - Numbers
  - Words, sentences, paragraphs, novels…
  - Images, sounds, 3D models, animations…
  - Functions and methods

VARIABLES IN COMPUTER LANGUAGES

- A variable is a name that can hold a value
- This concept is borrowed from algrbra
  - x = 5
  - x + 2 = ?
- Variables in computer languages can hold much more than just simple numbers
  - Numbers
  - Words, sentences, paragraphs, novels…
  - Images, sounds, 3D models, animations…
  - Functions and methods
  - Classes and GameObjects

Understanding the Features of C#

Understanding the Features of C#

- **C# is *Strongly Typed***

Understanding the Features of C#

- **C# is *Strongly Typed***
  - **In a non-strongly typed language, a variable can hold any kind of data**

Understanding the Features of C#

- **C# is *Strongly Typed***
  - **In a non-strongly typed language, a variable can hold any kind of data**
    - The same variable could hold a number one moment and an animation the next

Understanding the Features of C#

- **C# is *Strongly Typed***
  - **In a non-strongly typed language, a variable can hold any kind of data**
    - The same variable could hold a number one moment and an animation the next
  - **A *strongly typed* language restricts the type of data that can be held by any variable**

Understanding the Features of C#

- **C# is *Strongly Typed***
  - **In a non-strongly typed language, a variable can hold any kind of data**
    - The same variable could hold a number one moment and an animation the next
  - **A *strongly typed* language restricts the type of data that can be held by any variable**
    - **int x = 5;** – An int x can only hold an integer number

Understanding the Features of C#

- **C# is *Strongly Typed***
  - **In a non-strongly typed language, a variable can hold any kind of data**
    - The same variable could hold a number one moment and an animation the next
  - **A *strongly typed* language restricts the type of data that can be held by any variable**
    - **int x = 5;** – An int x can only hold an integer number
    - **float y = 3.4f;** – A float y can only hold a floating point number

Understanding the Features of C#

- **C# is *Strongly Typed***
  - **In a non-strongly typed language, a variable can hold any kind of data**
    - The same variable could hold a number one moment and an animation the next
  - **A *strongly typed* language restricts the type of data that can be held by any variable**
    - **int x = 5;** – An int x can only hold an integer number
    - **float y = 3.4f;** – A float y can only hold a floating point number
  - **Strong typing allows accurate syntax checking**

Understanding the Features of C#

- **C# is *Strongly Typed***
  - **In a non-strongly typed language, a variable can hold any kind of data**
    - The same variable could hold a number one moment and an animation the next
  - **A *strongly typed* language restricts the type of data that can be held by any variable**
    - **int x = 5;** – An int x can only hold an integer number
    - **float y = 3.4f;** – A float y can only hold a floating point number
  - **Strong typing allows accurate syntax checking**
    - The compiler can check your code for correctness

Understanding the Features of C#

- **C# is *Strongly Typed***
  - **In a non-strongly typed language, a variable can hold any kind of data**
    - The same variable could hold a number one moment and an animation the next
  - **A *strongly typed* language restricts the type of data that can be held by any variable**
    - **int x = 5;** – An int x can only hold an integer number
    - **float y = 3.4f;** – A float y can only hold a floating point number
  - **Strong typing allows accurate syntax checking**
    - The compiler can check your code for correctness
  - **Strong typing also allows robust code-completion**

Understanding the Features of C#

- **C# is *Strongly Typed***
  - **In a non-strongly typed language, a variable can hold any kind of data**
    - The same variable could hold a number one moment and an animation the next
  - **A *strongly typed* language restricts the type of data that can be held by any variable**
    - **int x = 5;** – An int x can only hold an integer number
    - **float y = 3.4f;** – A float y can only hold a floating point number
  - **Strong typing allows accurate syntax checking**
    - The compiler can check your code for correctness
  - **Strong typing also allows robust code-completion**
    - The code editor can guess what you want to type and auto-complete

Understanding the Features of C#

Understanding the Features of C#

- C# is *Function Based*

Understanding the Features of C#

- **C# is *Function Based***
  - **Computer programs used to be just a series of commands**

Understanding the Features of C#

- **C# is *Function Based***
  - Computer programs used to be just a series of commands
  - This was like giving driving directions to someone

Understanding the Features of C#

- **C# is *Function Based***
  - **Computer programs used to be just a series of commands**
  - **This was like giving driving directions to someone**
    1. From school, head north on Vermont

Understanding the Features of C#

- **C# is *Function Based***
  - **Computer programs used to be just a series of commands**
  - **This was like giving driving directions to someone**
    1. From school, head north on Vermont
    2. Head west on I-10 for about 7.5 miles (about 12Km)

Understanding the Features of C#

- **C# is *Function Based***
  - **Computer programs used to be just a series of commands**
  - **This was like giving driving directions to someone**
    1. From school, head north on Vermont
    2. Head west on I-10 for about 7.5 miles (about 12Km)
    3. At the intersection with I-405, take the 405 south for 2mi (3.2Km)

Understanding the Features of C#

- **C# is *Function Based***
  - **Computer programs used to be just a series of commands**
  - **This was like giving driving directions to someone**
    1. From school, head north on Vermont
    2. Head west on I-10 for about 7.5 miles (about 12Km)
    3. At the intersection with I-405, take the 405 south for 2mi (3.2Km)
    4. Take the exit for Venice Blvd.

Understanding the Features of C#

- **C# is *Function Based***
  - **Computer programs used to be just a series of commands**
  - **This was like giving driving directions to someone**
    1. From school, head north on Vermont
    2. Head west on I-10 for about 7.5 miles (about 12Km)
    3. At the intersection with I-405, take the 405 south for 2mi (3.2Km)
    4. Take the exit for Venice Blvd.
    5. Turn right onto Sawtelle Blvd.

Understanding the Features of C#

- **C# is *Function Based***
  - **Computer programs used to be just a series of commands**
  - **This was like giving driving directions to someone**
    1. From school, head north on Vermont
    2. Head west on I-10 for about 7.5 miles (about 12Km)
    3. At the intersection with I-405, take the 405 south for 2mi (3.2Km)
    4. Take the exit for Venice Blvd.
    5. Turn right onto Sawtelle Blvd.
    6. My place is just north of Venice on Sawtelle.

Understanding the Features of C#

- **C# is *Function Based***
  - **Computer programs used to be just a series of commands**
  - **This was like giving driving directions to someone**
    1. From school, head north on Vermont
    2. Head west on I-10 for about 7.5 miles (about 12Km)
    3. At the intersection with I-405, take the 405 south for 2mi (3.2Km)
    4. Take the exit for Venice Blvd.
    5. Turn right onto Sawtelle Blvd.
    6. My place is just north of Venice on Sawtelle.
  - **Functional languages allow the encapsulation of commands**

Understanding the Features of C#

- **C# is *Function Based***
  - **Computer programs used to be just a series of commands**
  - **This was like giving driving directions to someone**
    1. From school, head north on Vermont
    2. Head west on I-10 for about 7.5 miles (about 12Km)
    3. At the intersection with I-405, take the 405 south for 2mi (3.2Km)
    4. Take the exit for Venice Blvd.
    5. Turn right onto Sawtelle Blvd.
    6. My place is just north of Venice on Sawtelle.
  - **Functional languages allow the encapsulation of commands**
    - "If you see a store on the way, please `BuySomeMilk()`."

Understanding the Features of C#

- **C# is *Function Based***
  - **Computer programs used to be just a series of commands**
  - **This was like giving driving directions to someone**
    1. From school, head north on Vermont
    2. Head west on I-10 for about 7.5 miles (about 12Km)
    3. At the intersection with I-405, take the 405 south for 2mi (3.2Km)
    4. Take the exit for Venice Blvd.
    5. Turn right onto Sawtelle Blvd.
    6. My place is just north of Venice on Sawtelle.
  - **Functional languages allow the encapsulation of commands**
    - "If you see a store on the way, please `BuySomeMilk()`."
    - The `BuySomeMilk()` function encapsulates the many actions involved in finding and purchasing milk.

Understanding the Features of C#

Understanding the Features of C#

- C# is *Object-Oriented*

Understanding the Features of C#

- **C# is *Object-Oriented***
  - **Functions and data used to be separate**

Understanding the Features of C#

- **C# is *Object-Oriented***
  - **Functions and data used to be separate**
  - **Object-oriented programming introduced *classes***

Understanding the Features of C#

- **C# is *Object-Oriented***
  - **Functions and data used to be separate**
  - **Object-oriented programming introduced *classes***
  - **Classes combine functions and data into a single *object***

Understanding the Features of C#

- **C# is *Object-Oriented***
  - **Functions and data used to be separate**
  - **Object-oriented programming introduced *classes***
  - **Classes combine functions and data into a single *object***
    - Variables in classes are called *fields*

Understanding the Features of C#

- **C# is *Object-Oriented***
  - **Functions and data used to be separate**
  - **Object-oriented programming introduced *classes***
  - **Classes combine functions and data into a single *object***
    - Variables in classes are called *fields*
    - Functions in classes are called *methods*

Understanding the Features of C#

- **C# is *Object-Oriented***
  - **Functions and data used to be separate**
  - **Object-oriented programming introduced *classes***
  - **Classes combine functions and data into a single *object***
    - Variables in classes are called *fields*
    - Functions in classes are called *methods*
  - **This enables things like a flock of birds where each bird thinks for itself…**

Understanding the Features of C#

- **C# is *Object-Oriented***
  - **Functions and data used to be separate**
  - **Object-oriented programming introduced *classes***
  - **Classes combine functions and data into a single *object***
    - Variables in classes are called *fields*
    - Functions in classes are called *methods*
  - **This enables things like a flock of birds where each bird thinks for itself…**
    - …rather than being controlled by a single, monolithic program

Understanding the Features of C#

- **C# is *Object-Oriented***
  - **Functions and data used to be separate**
  - **Object-oriented programming introduced *classes***
  - **Classes combine functions and data into a single *object***
    - Variables in classes are called *fields*
    - Functions in classes are called *methods*
  - **This enables things like a flock of birds where each bird thinks for itself…**
    - …rather than being controlled by a single, monolithic program
  - **Object-orientation also allows *class inheritance***

Understanding the Features of C#

- **C# is *Object-Oriented***
  - **Functions and data used to be separate**
  - **Object-oriented programming introduced *classes***
  - **Classes combine functions and data into a single *object***
    - Variables in classes are called *fields*
    - Functions in classes are called *methods*
  - **This enables things like a flock of birds where each bird thinks for itself…**
    - …rather than being controlled by a single, monolithic program
  - **Object-orientation also allows *class inheritance***
    - A subclass can inherit the fields and methods of its superclass

Understanding the Features of C#

- **C# is *Object-Oriented***
  - **Functions and data used to be separate**
  - **Object-oriented programming introduced *classes***
  - **Classes combine functions and data into a single *object***
    - Variables in classes are called *fields*
    - Functions in classes are called *methods*
  - **This enables things like a flock of birds where each bird thinks for itself…**
    - …rather than being controlled by a single, monolithic program
  - **Object-orientation also allows *class inheritance***
    - A subclass can inherit the fields and methods of its superclass
    - e.g., a `Dog` would inherit all the fields and methods of its superclass `Mammal`, which would in turn inherit from `Animal`

Reading and Understanding C# Syntax

Reading and Understanding C# Syntax

- All languages have *syntax*:

Reading and Understanding C# Syntax

- All languages have *syntax*:

The dog barked at the squirrel.

Reading and Understanding C# Syntax

- All languages have *syntax*:

The dog barked at the squirrel.

At the squirrel the dog barked.

Reading and Understanding C# Syntax

- All languages have *syntax*:

The dog barked at the squirrel.

At the squirrel the dog barked.

The dog at the squirrel. barked

Reading and Understanding C# Syntax

- All languages have *syntax*:

The dog barked at the squirrel.

At the squirrel the dog barked.

The dog at the squirrel. barked

barked The dog at the squirrel.

Reading and Understanding C# Syntax

- All languages have *syntax*:

The dog barked at the squirrel. [Subject] [verb] [object].

At the squirrel the dog barked.

The dog at the squirrel. barked

barked The dog at the squirrel.

Reading and Understanding C# Syntax

- All languages have *syntax*:

The dog barked at the squirrel.	[Subject] [verb] [object].
At the squirrel the dog barked.	[Object] [subject] [verb].
The dog at the squirrel. barked	
barked The dog at the squirrel.	

Reading and Understanding C# Syntax

- All languages have *syntax*:

The dog barked at the squirrel.	[Subject] [verb] [object].
At the squirrel the dog barked.	[Object] [subject] [verb].
The dog at the squirrel. barked	[Subject] [object]. [verb]
barked The dog at the squirrel.	

Reading and Understanding C# Syntax

- All languages have *syntax*:

The dog barked at the squirrel.	[Subject] [verb] [object].
At the squirrel the dog barked.	[Object] [subject] [verb].
The dog at the squirrel. barked	[Subject] [object]. [verb]
barked The dog at the squirrel.	[verb] [Subject] [object].

Reading and Understanding C# Syntax

- All languages have *syntax*:

The dog barked at the squirrel.	[Subject] [verb] [object].
At the squirrel the dog barked.	[Object] [subject] [verb].
The dog at the squirrel. barked	[Subject] [object]. [verb]
barked The dog at the squirrel.	[verb] [Subject] [object].

- Only one of these sentences is correct

Reading and Understanding C# Syntax

- All languages have *syntax*:

The dog barked at the squirrel.	[Subject] [verb] [object].
At the squirrel the dog barked.	[Object] [subject] [verb].
The dog at the squirrel. barked	[Subject] [object]. [verb]
barked The dog at the squirrel.	[verb] [Subject] [object].

- Only one of these sentences is correct
  - Only one follows the rules of syntax of the English language

Reading and Understanding C# Syntax

- All languages have *syntax*:

The dog barked at the squirrel.	[Subject] [verb] [object].
At the squirrel the dog barked.	[Object] [subject] [verb].
The dog at the squirrel. barked	[Subject] [object]. [verb]
barked The dog at the squirrel.	[verb] [Subject] [object].

- Only one of these sentences is correct
  - Only one follows the rules of syntax of the English language
- The other sentences have *syntax errors*

Reading and Understanding C# Syntax

Reading and Understanding C# Syntax

- C# statements also have syntax rules

Reading and Understanding C# Syntax

- C# statements also have syntax rules
  - int x = 5;

Reading and Understanding C# Syntax

- **C# statements also have syntax rules**
  - **int x = 5;**
    - *Declares* a variable named **x** of the type **int**

Reading and Understanding C# Syntax

- **C# statements also have syntax rules**
  - **int x = 5;**
    - *Declares* a variable named **x** of the type **int**
      - If a statement starts with a type, the second word of the statement becomes a new variable of that type

Reading and Understanding C# Syntax

- **C# statements also have syntax rules**
  - **int x = 5;**
    - *Declares* a variable named **x** of the type **int**
      - If a statement starts with a type, the second word of the statement becomes a new variable of that type
    - *Defines* the value of **x** to be **5**

Reading and Understanding C# Syntax

- **C# statements also have syntax rules**
  - **int x = 5;**
    - *Declares* a variable named **x** of the type **int**
      - If a statement starts with a type, the second word of the statement becomes a new variable of that type
    - *Defines* the value of **x** to be **5**
      - The **=** is used to assign values to variables

Reading and Understanding C# Syntax

- **C# statements also have syntax rules**
  - **int x = 5;**
    - *Declares* a variable named **x** of the type **int**
      - If a statement starts with a type, the second word of the statement becomes a new variable of that type
    - *Defines* the value of **x** to be **5**
      - The **=** is used to assign values to variables
    - All C# statements end with a semicolon (**;**)

Reading and Understanding C# Syntax

- **C# statements also have syntax rules**
  - **int x = 5;**
    - *Declares* a variable named **x** of the type **int**
      - If a statement starts with a type, the second word of the statement becomes a new variable of that type
    - *Defines* the value of **x** to be **5**
      - The **=** is used to assign values to variables
    - All C# statements end with a semicolon (**;**)
      - A semicolon is used because the period is already used in decimal numbers

Reading and Understanding C# Syntax

Reading and Understanding C# Syntax

- C# statements also have syntax rules

Reading and Understanding C# Syntax

- C# statements also have syntax rules
  - int x = 5;

Reading and Understanding C# Syntax

- C# statements also have syntax rules
  - int x = 5;
  - int y = x * (3 + x);

Reading and Understanding C# Syntax

- **C# statements also have syntax rules**
  - **int x = 5;**
  - **int y = x * (3 + x);**
    - Declares a variable named **y** of the type **int**

Reading and Understanding C# Syntax

- **C# statements also have syntax rules**
  - **int x = 5;**
  - **int y = x * (3 + x);**
    - Declares a variable named **y** of the type **int**
    - Adds **3 + x** for a value of **8** (because x = 5)

Reading and Understanding C# Syntax

- **C# statements also have syntax rules**
  - **int x = 5;**
  - **int y = x * (3 + x);**
    - Declares a variable named **y** of the type **int**
    - Adds **3 + x** for a value of **8** (because x = 5)
      - Just as in algebra, order of operations follows parentheses first

Reading and Understanding C# Syntax

- **C# statements also have syntax rules**
  - **int x = 5;**
  - **int y = x * (3 + x);**
    - Declares a variable named **y** of the type **int**
    - Adds **3 + x** for a value of **8** (because x = 5)
      - Just as in algebra, order of operations follows parentheses first
    - Multiplies **x * 8** for a value of **40** (5 * 8 = 40)

Reading and Understanding C# Syntax

- **C# statements also have syntax rules**
  - **int x = 5;**
  - **int y = x * (3 + x);**
    - Declares a variable named **y** of the type **int**
    - Adds **3 + x** for a value of **8** (because x = 5)
      - Just as in algebra, order of operations follows parentheses first
    - Multiplies **x * 8** for a value of **40** (5 * 8 = 40)
    - Defines the value of **y** to be **40**

Reading and Understanding C# Syntax

- **C# statements also have syntax rules**
  - **int x = 5;**
  - **int y = x * (3 + x);**
    - Declares a variable named **y** of the type **int**
    - Adds **3 + x** for a value of **8** (because x = 5)
      - Just as in algebra, order of operations follows parentheses first
    - Multiplies **x * 8** for a value of **40** (5 * 8 = 40)
    - Defines the value of **y** to be **40**
    - Ends with a semicolon (**;**)

Reading and Understanding C# Syntax

Reading and Understanding C# Syntax

- C# statements also have syntax rules

Reading and Understanding C# Syntax

- C# statements also have syntax rules
  - string greeting = "Hello World!";

Reading and Understanding C# Syntax

- **C# statements also have syntax rules**
  - **string greeting = "Hello World!";**
    - Declares a variable named **greeting** of the type **string**

Reading and Understanding C# Syntax

- **C# statements also have syntax rules**
  - **string greeting = "Hello World!";**
    - Declares a variable named **greeting** of the type **string**
      - *strings* can hold a series of characters like a word or novel

Reading and Understanding C# Syntax

- **C# statements also have syntax rules**
  - **string greeting = "Hello World!";**
    - Declares a variable named **greeting** of the type **string**
      - *strings* can hold a series of characters like a word or novel
    - Defines the value of **greeting** to be **"Hello World!"**

Reading and Understanding C# Syntax

- **C# statements also have syntax rules**
  - **string greeting = "Hello World!";**
    - Declares a variable named **greeting** of the type **string**
      - *strings* can hold a series of characters like a word or novel
    - Defines the value of **greeting** to be **"Hello World!"**
      - Anything between double quotes is a ***string literal***, a value to be assigned to a string variable

Reading and Understanding C# Syntax

- **C# statements also have syntax rules**
  - **string greeting = "Hello World!";**
    - Declares a variable named **greeting** of the type **string**
      - *strings* can hold a series of characters like a word or novel
    - Defines the value of **greeting** to be **"Hello World!"**
      - Anything between double quotes is a ***string literal***, a value to be assigned to a string variable
    - Ends with a semicolon (**;**)

Reading and Understanding C# Syntax

Reading and Understanding C# Syntax

- C# statements also have syntax rules

Reading and Understanding C# Syntax

- C# statements also have syntax rules
  - string greeting = "Hello World!";

Reading and Understanding C# Syntax

- C# statements also have syntax rules
  - string greeting = "Hello World!";
  - print(greeting);

Reading and Understanding C# Syntax

- **C# statements also have syntax rules**
  - **string greeting = "Hello World!";**
  - **print(greeting);**
    - *Calls* the function **print()**

Reading and Understanding C# Syntax

- **C# statements also have syntax rules**
  - **string greeting = "Hello World!";**
  - **print(greeting);**
    - *Calls* the function **print()**
      - When a function is called, it executes its actions

Reading and Understanding C# Syntax

- **C# statements also have syntax rules**
  - **string greeting = "Hello World!";**
  - **print(greeting);**
    - *Calls* the function **print()**
      - When a function is called, it executes its actions
    - Passes the *argument* **greeting** into the function **print()**

Reading and Understanding C# Syntax

- **C# statements also have syntax rules**
  - **string greeting = "Hello World!";**
  - **print(greeting);**
    - *Calls* the function **print()**
      - When a function is called, it executes its actions
    - Passes the *argument* **greeting** into the function **print()**
      - Some functions take ***arguments***: data that changes how the function acts

Reading and Understanding C# Syntax

- **C# statements also have syntax rules**
  - **string greeting = "Hello World!";**
  - **print(greeting);**
    - *Calls* the function **print()**
      - When a function is called, it executes its actions
    - Passes the *argument* **greeting** into the function **print()**
      - Some functions take ***arguments***: data that changes how the function acts
      - The **print()** function will print the string **greeting** to the Console pane in Unity

Reading and Understanding C# Syntax

- **C# statements also have syntax rules**
  - **string greeting = "Hello World!";**
  - **print(greeting);**
    - *Calls* the function **print()**
      - When a function is called, it executes its actions
    - Passes the *argument* **greeting** into the function **print()**
      - Some functions take ***arguments***: data that changes how the function acts
      - The **print()** function will print the string **greeting** to the Console pane in Unity
      - The Console pane will display "Hello World!"

Reading and Understanding C# Syntax

- **C# statements also have syntax rules**
  - **string greeting = "Hello World!";**
  - **print(greeting);**
    - *Calls* the function **print()**
      - When a function is called, it executes its actions
    - Passes the *argument* **greeting** into the function **print()**
      - Some functions take ***arguments***: data that changes how the function acts
      - The **print()** function will print the string **greeting** to the Console pane in Unity
      - The Console pane will display "Hello World!"
    - Ends with a semicolon (**;**)

Chapter 17 – Summary

Chapter 17 – Summary

- You learned important features of C#

Chapter 17 – Summary

- You learned important features of C#
  - C# is a Compiled Language

Chapter 17 – Summary

- You learned important features of C#
  - C# is a Compiled Language
  - C# is Managed Code

Chapter 17 – Summary

- You learned important features of C#
  - C# is a Compiled Language
  - C# is Managed Code
  - C# is Strongly Typed

Chapter 17 – Summary

- You learned important features of C#
  - C# is a Compiled Language
  - C# is Managed Code
  - C# is Strongly Typed
  - C# is Function Based

Chapter 17 – Summary

- You learned important features of C#
  - C# is a Compiled Language
  - C# is Managed Code
  - C# is Strongly Typed
  - C# is Function Based
  - C# is Object-Oriented

Chapter 17 – Summary

- You learned important features of C#
  - C# is a Compiled Language
  - C# is Managed Code
  - C# is Strongly Typed
  - C# is Function Based
  - C# is Object-Oriented
- You learned to read and understand some C#

Chapter 17 – Summary

- You learned important features of C#
  - C# is a Compiled Language
  - C# is Managed Code
  - C# is Strongly Typed
  - C# is Function Based
  - C# is Object-Oriented
- You learned to read and understand some C#
- In the next chapter, you'll write your first Unity C# program