Module 3
Data Types, Variables, and Constants

Lecture
Real Numbers Data Types

Module 3 Learning Objectives

Bloom Level	Number	Name	Description	Course Learning Objectives
3: Apply	1	Given Types	Develop a console application that uses specified data types	Basic Programming Concepts
3: Apply	2	Selected Types	Develop a console application that uses programmer-selected data types	Basic Programming Concepts
2: Understand	3	Data Type Comparison	Compare and contrast different C# data types	Basic Programming Concepts
3: Apply	4	Calculations	Develop a console application that uses variables and constants for calculations	Basic Programming Concepts

In this lecture, we'll discuss the various data types we use to represent real numbers in C#

Discuss the problem of approximating the continuous domain, with an infinite number of numbers between 0 and 1, in the discrete domain using binary

- Floating point numbers
- `float`, `double`
  - Different number of bits in memory for each type
  - What does that tell us?
- Operations are all as you'd expect

In-Lecture Quiz

Floating point numbers are useful because they represent a large range of real numbers, but they come with some

- A: inaccuracy
- B: sadness
- C: pain and suffering
- D: loss of health

- `decimal`
  - Perfect accuracy
  - Smaller range of numbers than `float`
- Operations are all as you'd expect

In-Lecture Quiz

Decimals are useful as a data type because

- A: we can use variables
- B: we can represent real numbers exactly
- C: we can use constants
- D: Dr. T is the hippest cat in the land, and if he says so it’s good enough for me

- Recap
  - C# provides a variety of data types for representing real numbers
- Next Time
  - Other value types