**Lesson 5 – Data Types**

* Java includes 8 **Primitive Types**
  + Byte
  + Short
  + Int
  + Long
  + Float
  + Double
  + Char
  + Boolean
* **String is not a Primitive Data Type, it is a Class**
* **Primitive Data Types**
  + Used to help speed up the execution of the program
    - Use less memory
    - Have no Methods
    - Cannot be executed
    - Cannot be extended
  + Can get around this by using a **Wrapper Class**
    - **Wrapper Class** = Class that provides Methods for Primitive Data Types
      * **Example:** type = double, wrapper class = Double
* **Integer Data Types**

|  |  |  |  |
| --- | --- | --- | --- |
| **Type** | **Lower Limit** | **Upper Limit** | **Precision** |
| Byte | -128 | 127 | Exact |
| Short | -32 768 | 32 767 | Exact |
| Int | -2 147 483 648 | 2 147 483 647 | Exact |
| Long | -9 223 372 036 854 775 808 | 9 223 372 036 854 775 807 | Exact |

* + Bigger Range = More memory it can store
* **Float Types**

|  |  |  |  |
| --- | --- | --- | --- |
| **Type** | **Lower Magnitude** | **Upper Magnitude** | **Precision** |
| Float | + or - 1.4023 E-45 | + or - 3.4028 E+38 | 7 significant digits |
| Double | + or – 4.9406 E-324 | + or – 1.7969 E+308 | 16 significant digits |

* + Because floats and doubles are not precise problems can arise with precision
* Data is automatically converted from Integer Types to a Float Type
* Converting from Float Types to integer Types it requires a **cast**
  + **Casting** loses precision as it does not round the number it just takes everything before the decimal
  + To round a Float Type, we must use methods from the Math Class
  + Casting to a Type that stores less can cause the value to lose precision
* **Boolean Type**
  + Can be converted to an int (1 or 0)
  + Can be converted from an int
* **Char Type**
  + Stores a single Unicode Character
  + Written with single quotes
  + Special characters can be stored using escape sequences
  + Can be converted from