**Lesson 1 – Input & Output**

* Input and Output is accomplished in 2 ways
  + Using **Scanner** class
  + System.out (for output)
* User Input 3 step process
  + Create a **Scanner** Object
  + Check Input for Errors
  + Input Data
* **Scanner**
  + Object that has methods that allow us to get data from the user
  + **Sample Methods**
    - **String nextLine()**
      * Returns all text in the current line
    - **String next()**
      * Returns the next token (skipping any whitespace)
    - **Int nextInt(), double nextDouble(), etc**
      * Returns next Token as the specified type (skipping any whitespace)
* Must check the user input to ensure the data is the right type before accessing it
* Convenient to make a class full of static methods that do error checking for you whenever you get user input
* Use the **print()** or **println()** method to output data
  + **print()** method if you wish to stay on the same line
  + **println()** method if you want to go to the next line
* **Escape Sequences =** Ways to format our output (they start with a backslash “\”)
* **printf()** method is a method of formatting the output
  + It contains this information: %[flags][width][.precision] conversion-character **NOTE: Everything in the square brackets is optional and the 2 beginning and end items are required**
    - **%** = Represents a new format item
      * You can have different format items for each object to be outputted
    - **[flags]** = Piece of data that can or cannot be outputted
      * “-“ means left-justify (default is to right-justify)
      * “+” outputs a plus or minus sign for a numerical value
      * “ “ (space) outputs a minus sign if the number is negative or a space if it is positive
    - **[width]** = Specifies the number of characters that must be in the output
      * Unused characters will be displayed as spaces
    - **[.precision]** = Specifies the number of decimal places in a floating-point value
    - **conversion-character** = Tells us what type of data we are trying to output
      * **d** = Decimal Integer (byte, short, int, or long)
      * **f** = Floating-point number (float or double)
      * **c** = Character (Capital C will uppercase the letter)
      * **s** = String (Capital S will uppercase all of the letters)