JAVA ASSIGNMENT 1

1.) Explain the differences between primitive and reference data types.

⟹ Primitive data types store actual values, are initialized by default, and can never be null. whereas reference data types store the memory address of an object, are initialized by default to null, and can be used to represent complex objects such as strings, arrays, and user-defined classes.

2.) Define the scope of a variable (hint: local & global variable)

→ Local variables are only visible within the block of code where they are declared, while global variable are visible throughout the entire program

3.) Why is initialization of variables required.?
→ It can help with code readability
   & maintanability.

4.) Differenciate between static, instance
   & local variables.
@ Local variables -> These are variables that
     are declared inside a method, constructor,
     or block and are only accessible within
     that method, constructor or block.
ⓑ Instance variables -> These variable are declared
     inside a class but outside a method,
     constructor or block. They are created
     when an object of the class is created
     and destroyed when the object is destroyed.
ⓒ Static variables -> Are declared inside a class
     but outside a method, constructor or block.
     They are created when the program starts
     and destroyed when the program stops.

5.) Differentiate between widening & narrowing casting in Java.

@ Widening Casting → Is the conversion of a smaller data type to a larger data type. Widening casting takes place when a variable of a smaller data type is assigned to a variable of a larger data type.

ⓑ Narrow Casting → Is the conversion of a larger data type to smaller data type. Takes place when a variable of a larger data type is assigned to a variable of a smaller data type.

6.) Filling in the missing values.

Type	Size (In bytes)	Default	Range
boolean	1 bit	false	true, false
Char	2	\u0000	'\0000' to '\ffff'
Byte	8 bit	0	-128 to 127
Short	16 bit	0	-2^{15} to $+2^{15}-1$
Int	4 32 bit	0	-2,147,483,648 to 2,147,483,647
Long	1 byte.	0L	-128 to 127 (inclusive)
Float	4	00.0f	$1.40239846 \times 10^{-45}$ to $3.40282347 \times 10^{38}$
Double	8	0.0d	$-1.8E+308$ to $+1.8E+308$

7.) Define package as used in java programming.
→ Is a namespace that groups related classes
and interfaces together.

8.) Explain the importance of using Java packages.
→ They make it easier to locate and use classes,
interfaces, enumerations, and annotations. By encapsulating
similar classes and functions in a package,
it becomes easier to search for and locate the
required code.