WEEK 2 : VARIABLES, CONSTANT, DATA TYPES

* JDK 8.0 and above

VARIABLES

- need to declare before use
- 3 types : (i) INSTANCE variables (specific to created objects)
  (ii) LOCAL variables (related to methods)
  (iii) STATIC variables

(i) instance variables :

↳ non-static variable

↳ declared in a class, outside all methods

* Declaration
  (eg. int age ;)
* Declaration
  (eg. int age =10 ;)

DATA TYPES

↳ Strings
- store text
- eg. String myText = "Hello 82" ;

↳ int, short, long
- store integers WITHOUT DECIMALS
- eg. int myNum = 2147483647 ;
  short myShortNum = 32767 ;
  long myLongNum = 9223372036854775807 ;

↳ double, float
- store floating point numbers WITH DECIMALS
- eg. double myDoubleNum = -7.77 ;
  float myFloatNum = 5.79f ;

↳ char
- store single characters
- eg. char myLetter = 'F' ;

↳ boolean
- store values with 2 states
  ↳ TRUE OR FALSE
- eg. boolean myBool = True ;

↳ byte
- store whole numbers from -128 to 127
- eg. byte myByte = 77 ;

* Primitive DATA TYPES : byte, long, int, short, float, double , boolean , char

CONSTANTS

↳ variables whose values can NOT change

↳ declared with keyword : final

↳ Naming convention : ALL_CAPS_WITH_UNDERSCORES

↳ public final double PI = 3.14159 26535 89793

CONVERSIONS

↳ DON'T allow double assigned to integer variable

↳ WHY? Fractional part of value will be lost

↳ DO allow boolean assigned to boolean variables only

↳ WHY? Don't make sense to obtain boolean True or False from other data types

↳ DON'T allow string assigned to numeric type (eg. int, float, double)

* Even if it make sense

↳ WHY? ... you just can't

CONVERSION TYPES

(i) Widening

↳ NO information loss

↳ Done automatically ⇒ conversions

↳ eg. int (8) → double (8.0)

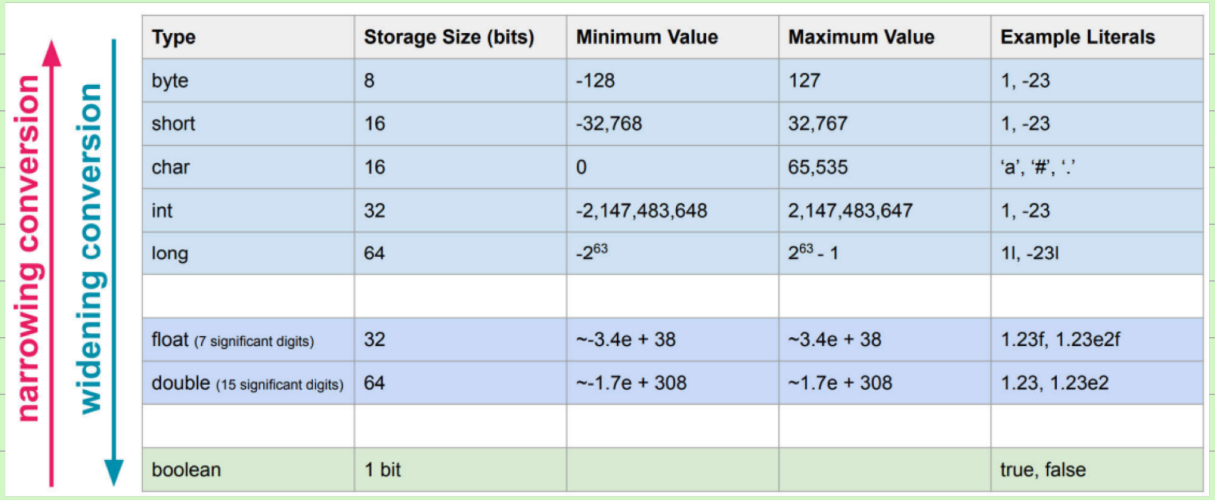
(ii) Narrowing

↳ Probability of information loss

↳ "Forcefully" allows programmers to insist (explicit) ⇒ casting

↳ eg. double (7.77) → int (7)

* Conversions happens when you try to assign values from one data type to another



Type	Storage Size (bits)	Minimum Value	Maximum Value	Example Literals
byte	8	-128	127	1, -23
short	16	-32,768	32,767	1, -23
char	16	0	65,535	'a', '#', '.'
int	32	-2,147,483,648	2,147,483,647	1, -23
long	64	-2^{63}	$2^{63}-1$	1l, -23l
float (7 significant digits)	32	~-3.4e + 38	~3.4e + 38	1.23f, 1.23e2f
double (15 significant digits)	64	~-1.7e + 308	~1.7e + 308	1.23, 1.23e2
boolean	1 bit			true, false