

Every data type has a range of values. The compiler allocates memory space for each variable or constant according to its data type. Java provides eight primitive data types for numeric values, characters, and Boolean values.

byte: The byte data type is an 8-bit. It has a minimum value of -128 and a maximum value of 127 (inclusive). The byte data type can be useful for saving memory in large arrays, where the memory savings actually matters. They can also be used in place of int where their limits help to clarify your code; the fact that a variable's range is limited can serve as a form of documentation.

short: The short data type is a 16-bit. It has a minimum value of -32,768 and a maximum value of 32,767 (inclusive). As with byte, the same guidelines apply: you can use a short to save memory in large arrays, in situations where the memory savings actually matters.

int: By default, the int data type is a 32-bit, which has a minimum value of -2^{31} and a maximum value of $2^{31}-1$. Static methods like compare, divide have been added to the Integer class to support the arithmetic operations for unsigned integers.

long: The long data type is a 64-bit. The signed long has a minimum value of -2^{63} and a maximum value of $2^{63}-1$. Use this data type when you need a range of values wider than those provided by int. The Long class also contains methods like compare, divide etc to support arithmetic operations for unsigned long.

float: The float data type is a single-precision 32-bit. As with the recommendations for byte and short, use a float (instead of double) if you need to save memory in large arrays of floating point numbers. This data type should never be used for precise values, such as currency. For that, you will need to use the java.math.BigDecimal class instead.

double: The double data type is a double-precision 64-bit. For decimal values, this data type is generally the default choice. As mentioned above, this data type should never be used for precise values, such as currency.

boolean: The boolean data type has only two possible values: true and false. Use this data type for simple flags that track true/false conditions. This data type represents one bit of information, but its "size" isn't something that's precisely defined.

char: The char data type is a single 16-bit Unicode character. It has a minimum value of '\u0000' (or 0) and a maximum value of '\uffff' (or 65,535 inclusive).