**INPUT IN JAVA**

Input in Java is a little more complicated than output in Java. Input is anything that the user enters. You must first decide what type of data (data type) that you want to store and you must also give it a name.

DATA TYPES IN JAVA

It is important that you choose the most appropriate data type (in any programming language) so that:

1. Your program will not crash and
2. That it is as efficient as it can be.

You will, more often than not, need to read in values from the keyboard for a program. In this case you need to declare a **variable** to store the data. The syntax for declaring a variable is:

data type variable name; or

data type variable name1, variable name 2, etc;

The following data types are available in Java:

|  |  |  |  |
| --- | --- | --- | --- |
| Data Type | Size | Range | Comment |
| byte | 8 bits (a byte) | -128 - +127 | Whole numbers only. |
| short | 2 bytes | -32,768 - + 32, 767 | Whole numbers only. |
| int | 4 bytes | -2,147,483,648 -  +2,147,483,648 | Whole numbers only. |
| long | 8 bytes | -9,223,372,036,854,775,808 -  +9,223,372,036,854,775,808 | Whole numbers only. |
| float | 4 bytes | Floating point values, IEEE Standard 754 | Low precision point numbers. |
| double | 8 bytes | Floating point values, IEEE Standard 754 | High precision decimal point. |
| char | 2 bytes | 0 – 655353 (UNICODE character). |  |
| boolean | 1 byte | True or false | Underlying value stored a 1 (true) or 0 (false). |
| String | 2 bytes per character | No limit (realistically). | Collection of characters. |

Note that String is the only data type with an initial cap. This is because String is a class.

**Exercise: What data type would you use for each of the following?**

|  |  |  |  |
| --- | --- | --- | --- |
| Data to be stored | Data type | Data to be stored | Data type |
| A person’s age | byte | A day of the week e.g. “Monday” | String |
| A year | short | The area of a room | float |
| Gross pay amount | float | Pi | double |
| A mark out of 100 | byte | A PPS Number | String |
| An address | String | An answer (Y or N) | char |
| A temperature | float | A electricity meter reading | float |

# NAMING VARIABLES

A variable is the name of the storage location where the value that is input will be stored. You must give it a name, subject to the following naming rules.

* Variable names can only consist of letters, digits, dollar signs and/or the underscore character. Conventionally:
  1. The dollar sign is generally not used when naming variables.
  2. Variables are named in camel case i.e. the first word of a variable is all in lowercase and the second and subsequent words (if any) are written with initial capital letters e.g. grossPay
* A variable name cannot begin with a digit. Conventionally, variable names always begin with a letter.
* A variable name cannot be a Java keyword.

Examples:

**num2** is a valid variable name.

**2Num** is not.

**Second Num** is not.

**SecondNum** is.

**a** is valid but may not be meaningful

**Exercise: Fill in the following table.**

|  |  |  |
| --- | --- | --- |
| **Variable Name** | **Valid?** | **Reason if not valid** |
| private |  |  |
| score |  |  |
| 2timesTable |  |  |
| [num1] |  |  |
| num\_2 |  |  |
| answer? |  |  |
| halfTimeScore |  |  |
| $MoneyEarned |  |  |
| grossPay |  |  |
| dd-mm-yy |  |  |

# READING IN A VALUE

1. You need to import a class that contains the code for reading in values. This class is called Scanner and reads simple data types (and assumes that values entered are separated by a white space.

|  |
| --- |
| package sample;  import java.util.Scanner;    public class Hello {  public static void main (String[] args) {  }  } |

1. You need to create a new Scanner *object* and name that object. You also need to specify where the scanner object is to scan input from.

|  |
| --- |
| package sample; import java.util.Scanner; public class Hello {  public static void main (String[] args) {  /\* The line underneath creates a new Scanner object (called sc) and specifies that the input is to be scanned from the console window  (System.in).\*/    Scanner sc = new Scanner(System.*in*); } |

1. You can now read in a value into a variable using the following syntax:

varName = scannerName.nextByte (); // Read a byte value and store it in varName varName = scannerName.nextShort (); // Read a short value and store it in varName varName = scannerName.nextInt (); // Read an integer value and store it in varName varName = scannerName.nextLong (); // Read a long value and store it in varName varName = scannerName.nextFloat (); // Read a float value and store it in varName varName = scannerName.nextDouble (); // Read a double value and store it in varName varName = scannerName.nextChar (); // Read a char value and store it in varName varName= scacnnerName.next (); // Read a string value and store it in varName

# WORKED EXAMPLE

Read in a name and output “Hello” followed by your name. There are a couple of new things here:

1. You are reading in a value from the keyboard.
2. You are outputting two things: Hello and your name.

**Algorithm**

OUTPUT “What is your name?”

INPUT personName [string]

OUTPUT “Hello” + personName

**Code**

|  |
| --- |
| import java.util.Scanner;    public class Area {  public static void main (String[] args) {  Scanner sc = new Scanner(System.*in*);    System.*out*.println ("What is your name? ");  String yourName = sc.next ();  System.*out*.println("Hello " + yourName); }  } |

# EXERCISE

Modify the above program so that it also asks for your address (1 line) and outputs “Hello” + your name + “. You live in “ + address