

## Built-In Routines

Each of Igor's built-in routines is categorized as a function or as an operation.

A built-in function is an Igor routine, such as `sin`, `exp` or `ln`, that directly returns a result. A built-in operation is a routine, such as `Display`, `FFT` or `Integrate`, that acts on an object and may create new objects but does not directly return a result.

A good way to get a sense of the scope of Igor's built-in routines is to scan the sections **Built-In Operations by Category** on page V-1 and **Built-In Functions by Category** on page V-7 in the reference volume of this manual.

For getting reference information on a particular routine it is usually most convenient to choose Help→Command Help and use the Igor Help Browser.

## User-Defined Procedures

A user-defined procedure is a routine written in Igor's built-in programming language by entering text in a procedure window. It can call upon built-in or external functions and operations as well as other user-defined procedures to manipulate Igor objects. Sets of procedures are stored in procedure files.

You can create Igor procedures by entering text in a procedure window.

Each procedure has a name which you use to invoke it.

```

0 #pragma TextEncoding = "UTF-8"
1 #pragma rtGlobals=3 // Use modern global access method and strict wav
2
3 // RemoveOutliersXY(xWave, yWave, minVal, maxVal)
4 // Removes each point in an XY pair whose Y value is below minVal or above
5 // Returns the number of points removed.
6 Function RemoveOutliersXY(xWave, yWave, minVal, maxVal)
7     Wave xWave
8     Wave yWave
9     Variable minVal, maxVal
10
11     Variable index, numPoints, numOutliers
12     Variable val
13
14     numOutliers = 0
15     index = 0 // The loop index
16     numPoints = numpts(yWave) // Number of times to loop
17
18     do
19         val = yWave[index]
20         if ((val < minVal) %| (val > maxVal)) // Is this an outlier

```

Procedures can call operations, functions or other procedures. They can also perform waveform arithmetic.

## Igor Extensions

An extension is a “plug-in” - a piece of external C or C++ code that adds functionality to Igor. For historical reasons, we use the term “XOP” to refer to an Igor extension. “XOP” is a contraction of “external operation”. The terms “XOP” and “Igor extension” are synonymous.