C# How To

How To	Instructions

Order of Precedence	```* / %```
	```+ -```
	```== != < > <= >=```
	```! (not)```
	```&&```
	```||```

Format Numbers	```.ToString("N") or C or P or D or F``` ```.ToString("N0") number of decimal places```
Declare an array	```int[] myArray = new int[50];``` ```int[] myArray = {10,20,30};```
Determine size of array	```myArray.Length```

Sort an array	```Array.Sort(myArray) //ascending```
	
	```Array.Sort(myArray)```
	```Array.Reverse(myArray) //descending```
	``` //Or define Compare function```

Declare a n-D array	```int[,] myArray = new int[2,3];```

Initialize an n-D array	```foreach(int element in myArray) {```
	``` element = 0;```
	```}```

Search an array	```index = Array.BinarySearch(myArray, findme);```
Get image from file	```picBox.Image =``` ```System.Drawing.Image.FromFile("filename");```
Clearing an image	```picBox.Image = null;```
Determine the maximum/minimum values for a type	```Integer.MinValue``` ```Integer.MaxValue```

Use the value of pi π	`System.Math.PI`
Determine ASCII number for a character	`value=(int)'W';  //Note single apostrophe character`
Determine the character represented by an ASCII number	`str = (char) 65;`
Extracting part of a Date	`myDate.Month    //etc.`
Set the file filter for a dialog box	`dlg.Filter = "Text Files (*.txt)	*.txt |` ` All Files (*.*)	*.*";`

Determine the locations of the user's system folders	`strDir = Environment.GetFolderPath(`
	`   Environment.SpecialFolder.Desktop)`
	`or .MyComputer`
	`or .MyDocuments or .MyMusic or .MyPictures or .MyVideos`
	`or .Recent`
	`or .SystemDirectory  //Not special folder`
	`or .CurrentDirectory //Not special folder`

Determine application directories	`Application.StartupPath`
	`Application.ExecutablePath //Includes program filename`
	`Application.UserAppDataPath`
	`Application.LocalUserAppDataPath`
	`System.IO.Directory.GetCurrentDirectory`

Parsing a delimited string (Split)	`string[] parts;` `parts = myString.split(' ');  //Note apostrophes`
Creating a custom color	`Color.FromArgb(redvalue, greenvalue, bluevalue)`

Determine the workable space of a form (*client area*)	`//These exclude borders and title bar`
	`this.ClientSize (returns a Size class)`
	`this.ClientSize.Height`
	`this.ClientSize.Width`

How to create *hover buttons* (buttons that change color when you touch them with the mouse)	`Use the button's MouseEnter and MouseLeave events to` `change the color of the button appropriately`
Setting conditional or hit count breakpoints	Set the breakpoint. Right-click the red breakpoint circle and choose the type of breakpoint
Determine the scrollbar width	`SystemInformation.VerticalScrollbarWidth` In a data grid, add all column widths + ScrollbarWidth + 3 to keep horizontal scrollbar from showing

Create list box or combo box that stores more than one value, displaying only one, without a data adapter.	Create a class that contains all the members.
	Provide a property for each field you need access to.
	Add the following method
	`public override string ToString(){`
	This controls what is displayed in the combo/list.
	To access hidden data:
	`Ctype(cmbName.SelectedItem,ClassName).membername`

| Play a sound | ```
SoundPlayer simpleSound =
    New SoundPlayer("@c:\folder\mysound.wav");
    simpleSound.Play();
``` |
| Launch another program | ```
System.Diagnostics.Process.Start(exefilename)
System.Diagnostics.Process.Start(associateddatafilename)
``` |
| Use a case statement to determine which radio button is selected | ```
switch(true) {
   case rdoOne.Checked:   code here
   case rdoTwo.Checked:   code here
   case rdoThree.Checked: code here
   Etc.
} //end switch
``` |
| Locate web services | `Google WSDL list` |
| Determining the smaller / larger of two numbers[4] | ```
smallest = Math.Min(value1, value2);
largest = Math.Max(value1, value2);
``` |
| Access the Windows clipboard | ```
Clipboard.SetDataObject(data)
IDataObject iData = Clipboard.GetDataObject()
``` |
| Screen properties | `Screen.PrimayScreen` |
| Determine the current user's name | `Environment.UserName` |
| Access an image in project resources | ```
Be sure to include the image in your project as a
Project resource file
        • Import image using a PictureBox Image property
        • Use My Project, Resources, Add Resource, Existing

Properties.Resources.filename
(filename will appear without extension)
``` |
Select Multiple Listbox items at run-time	Note: Multiple select must be enabled. `lstBox.SetSelected(index, True/False)`
Validating and Exit	Exit buttons (and the form close button) ignore CausesValidaton = False commands (by design? so can't exit with invalid data). This only seems to occur if the validation code opens a message box or other dialog box. Solution: display error in a label or error provider
Grid, Select First Row	grd.CurrentCell = grd.FirstDisplayedCell; If grid is tied to a data adapter, first row is automatically selected when data adapter is filled.

Apostrophe in Filter	A binding source requires apostrophes around a like clause in the filter designation.
	
	``
	bndTable.Filter = "Name Like '*" + txtSearch.Text + "*'";
	``
	
	These can NOT be replaced with quotation marks. If txtSearch contains an apostrophe (O'Keefe), this statement will cause an exception. To solve the problem, replace all apostrophes in txtSearch with two apostrophes.
	
	``
	string filter = txtSearch.Text.Replace("'", "''");
	bndTable.Filter = "Name Like '*" + filter + "*'";
	``

Multi-Select Listbox, Bound, SelectedValues	Selected values are only available for single-select, bound list boxes. However, you can still retrieve the value members from the selected items.
	
	``
	foreach(DataRowView itm In myListBox.SelectedItems) {
	    Console.WriteLine(itm.Item(1).ToString);
	}//end for
	``
	
	Note that each item in a **bound** list box is a DataRowView. This row has indexed columns. This example extracts the value of the second column. You could also use this to store entire rows in a list box (many fields) and extract any field data you may need.

Search a binding source on multiple fields	```
	bsEmpHours.Position =
	    bsEmpHours.Find("empDate", currRecord.empDate) &&
	    bsEmpHours.Find("starttime", currRecord.startTime) &&
	    bsEmpHours.Find("endtime", currRecord.endTime);
	``

Grid, Custom Format	To change the format of a column's data, you first need to define a column style.
	``
	DataGridViewCellStyle colStyle = New
	DataGridViewCellStyle
	``
	
	Then, change the properties of the style (some examples)
	``
	    colStyle.Format = "ddd, MMM d, yyyy";
	    colStyle.Alignment =
	        DataGridViewContentAlignment.MiddleCenter;
	    colStyle.Font = New Font("Arial Black", 10);
	``
	
	Finally, apply the style to a column
	``
	    grdName.Columns("Name").DefaultCellStyle = colStyle;
	``

Grid, Custom Column Header Format	Follow the instructions to create a custom grid format above.
	To apply the style to just a column header, apply the style to the HeaderCell.Style
	``
	    grdName.Columns("Name").HeaderCell.Style = colStyle;
	``

Determine the width of a printed string	(This code is normally inside a PrintPage method)
	``
	Font myFont = new Font("Arial", 12, FontStyle.Bold);
	w = ev.Graphics.MeasureString(theString, myFont).Width;
	``

Determine the width of a string before it is printed (without a print document)	This code allows you to check the length of a string on a form to determine how wide (in 100ths of an inch) it will be when it is printed. ```\nGraphics g;\nSystem.Drawing.Printing.PrinterSettings instance =\n new System.Drawing.Printing.PrinterSettings();\ng = instance.CreateMeasurementGraphics();\n\nFont myFont = new Font("Arial", 12, FontStyle.Bold);\n\nw = g.MeasureString(theString, myFont).Width;\n``` Note: font must be int or float (not double)

Error Before Form Load	InvalidOperationException was unhandled
	This occurs because some object(s) is causing a TextChanged or ValueChanged event to occur **before** the form load event occurs.
	Causes:
	   • Setting a date picker Value at design time
	   • Using a MaskedTextBox
	Solution:
	   • Reset date picker Value in design
	   • Don't use MaskedTextBox. The MTB causes a text changed event to occur before Form Load REGARDLESS of any settings
	   • If you must use a MTB, instantiate currRecord when it is defined (form declarations) and not in frmLoad

File Management	System.IO.File.(pick your file mgt command)
Getting an object reference given the String version of its name	```\nprivate void mnuCategory_Click(object sender,EventArgs\ne) {\nToolStripMenuItem mnu = (ToolStripMenuItem)sender;\nRadioButton rdo;\n\nrdo = (RadioButton) this.Controls.Find("rdo" + mnu.Text,\n true).ElementAt(0);\n\nrdo.PerformClick();\n\n}\n``` Notes: this.Controls.Find(string, True) creates an array of objects with the given string name. True designates, *search child elements* .ElementAt(0) returns the first element of the array (should only be one)

Email Message (Create)	This code generates and email message with a TO: list a subject and a body. ``` System.Diagnostics.Process.Start("mailto:" + toList + "?subject=" + subject + "&body=" + body); ``` Note: if there is no subject but a body (poor idea), body is preceded by the "?", not the "&" (See Independent Study program)
Crystal Reports and VS2012	Crystal Reports won't run. Note: this may be a temporary issue with VS12 and Crystal Reports. Note: even with this fix, running one CR after another or launching a report from another form may still cause errors on some computers. ➢ My Project, Compile, Advanced Compile Options ➢ Change Target Framework (keep same Framework number, but select the option that DOES NOT include *Client Profile* ➢ In the Solution Explorer, double-click App.config file ➢ Replace the \<startup\> tag all the way down to the \</startup\> with the following: ``` <startup useLegacyV2RuntimeActivationPolicy="true"> <supportedRuntime version="v4.0"/> </startup> ```

Data Grid, Insert Null value in numeric column	```
	if (currRecord.FieldName == NULLVALUE)
	  Cell address = null;
	else
	  Cell address = currRecord.FieldName;
	``

Save program settings between execution	1. Properties 2. Settings tab (on left) 3. Type setting name, select type, select scope (user) 4. In code: `this.Settings.settingName = some value;` `My.Settings.Save();` 5. In code: `variable = My.Settings.settingName;` Can also link to a form object. 1. Select object in design mode 2. ApplicationSettings ▸ PropertyBinding 3. Type name of setting Can now be referenced in code.
When adding controls, mouse icon gets stuck	Right-click Toolbox Reset Toolbox

isNumeric equivalent	```
	int temp; //Needed for TryParse
	if(int.TryParse(strNumber, out temp)
	``

Try/Catch with no exception	Remove ( ) and everything in between