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# Expression Types and Syntax Examples

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### Expression Types and Syntax Examples

Following are different types of Expressions and their syntax examples:

- **General Symbols (Arithmetic)**

- `1 + "4"` will return the value 5
- `2.3 * 3` will return the value 6.9
- `12/5` will return the value 2.4
- `12\5` will return the value 2
- `25 mod 3` will return the value 1

- **String Concatenation**

- `1 & "4"` will return the value "14"
- `"Pipe" & "and" & "Valve"` will return the value "Pipe and Valve"

- **IIf Symbols (Condition)**

- `IIf (500>200, "math ok", "math wrong")` will return the value "math ok"
- `IIf (500<200, "math ok", "math wrong")` will return the value "math wrong"

- **IIf Smbol (Comparison)**

- `20<10` will return the value "false"
- `IIf(System.String.Compare ("Pipe", "Pipe"), "match", "no match")` will return the value "match"

- **System Math**

- `System.Math.Abs (value)`
- `System.Math.Acos (value)`
- `System.Math.Asin (value)`
- `System.Math.Atan (value)`
- `System.Math.Atan2 (y,x)`
- `System.Math.BigMul (a,b)`
- `System.Math.Ceiling (a)`
- `System.Math.Cos (r)`
- `System.Math.Cosh (r)`
- `System.Math.E`
- `System.Math.Exp (p)`
- `System.Math.Floor (d)`
- `System.Math.IEEERemainder (x,y)`
- `System.Math.Log (r)`
- `System.Math.Log10 (d)`
- `System.Math.Max (x,y)`
- `System.Math.Min (x,y)`
- `System.Math.PI`
- `System.Math.Pow (x,y)`
- `System.Math.Round (value)`
- `System.Math.Sin(45*System.Math.PI/180)`
- `System.Math.Sin(Double a)`
- `System.Math.Sinh(a)`
- `System.Math.Sqrt(Double d)`
- `System.Math.Tan (a)`
- `System.Math.Tanh (a)`
- `System.Math.Round(4.53459)`

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- `System.Math.Log(1.2) / System.Math.Log(0.1)`
- `System.Math.Max(1.2, 1.1)`
- **System Path**
  - `System.Path.GetFileNameWithoutExtension("C:\ProgramData\Bentley\MicroStation CONNECT Edition\Configuration\Organization\Dgnlib\Gui\test.dgnlib")` will return the value "test"
  - `System.Path.GetExtension("C:\ProgramData\Bentley\MicroStation CONNECT Edition\Configuration\Organization\Dgnlib\Gui\test.dgnlib")` will return the value ".dgnlib"
  - `System.Path.Combine (path1,path2)`
  - `System.Path.GetDirectoryName (path)`
  - `System.Path.GetExtension (path)`
  - `System.Path.GetFileName (path)`
  - `System.Path.GetFileNameWithoutExtension (path)`
  - `System.Path.GetFullPath (path)`
- **System String**
  - `System.String.Compare (string1,string2)`
  - `System.String.CompareI (string1,string2)`
  - `System.String.Contains(String string1, String string2)`
  - `System.String.ContainsI(String string1, String string2)`
  - `System.String.Format (format,arg0)`
  - `System.String.IndexOf(search,find)`
  - `System.String.LastIndexOf (search,find)`
  - `System.String.Length("Pipe")` will return the value "4"
  - `System.String.Substring (value,startIndex,length)`
  - `System.String.ToLower (value)`
  - `System.String.ToString (value)`
  - `System.String.ToUpper (value)`
  - `System.String.Trim (value)`
- **Element Properties**
  - `this.GetElement().ElementID`
  - `this.GetElement().TotalLength`
  - `this.GetElement().ElementDescription`
  - `this.GetElement().Color`
- **Model Properties**
  - `this.GetModel().Is3D`
  - `this.GetModel().Name`
  - `this.GetModel().Description`
  - `this.GetModel().Resolution`
- **File Properties**
  - `this.GetFile().Author`
  - `this.GetFile().Editor`
  - `this.GetFile().FileName`
- **GetItemSameLibrary()**
  - `this.GetItem("Lib1Itp1").TextProp`
  - `this.GetItem("Lib1Itp1").IntegerProp`
  - `this.GetItem("Lib1Itp1").DoubleProp`
  - `this.GetItem("Lib1Itp1").ArrayProp[0] & "\" & this.GetItem("Lib1Itp1").ArrayProp[1]`
- **GetItemDifferentLibrary()**

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- `this.GetItem("Lib1:Lib1Itp1").TextProp`
- `this.GetItem("Lib1:Lib1Itp1").IntegerProp`
- `this.GetItem("Lib1:Lib1Itp1").ArrayProp[0] & " \" & this.GetItem("Lib1:Lib1Itp1").ArrayProp[1]`

- **GetItemExtrinsicSchema**

- `this.GetItem("DGNECPlugin_Test:Father").FirstName`
- `this.GetItem("DGNECPlugin_Test:Father").FirstName & " \" & this.GetItem("DGNECPlugin_Test:Father").LastName`

- **GetItemRelatedExtrinsicSchema**

- `this.GetItem("DGNECPlugin_Test:Father").FirstName & " \" & this.GetItem("DGNECPlugin_Test:Father").LastName"`

**Note:** `GetRelatedItem` has been deprecated. Use `*GetRelatedInstance*` instead.

- **MSTN variable**

- `MSTNvariable.GetLocalTempDirectoryBaseName()`
- `MSTNvariable.GetNameForTemporaryFile(String partialPathName, String prefix)`
- `MSTNvariable.GetVariable("MS_CELL")`
- `MSTNvariable.IsVariableDefinedAndTrue("MS_CELL")`
- `MSTNvariable.IsVariableDefinedAndFalse("MS_CELL")`
- `MSTNvariable.IsVariableDefined("MS_CELL")`
- `MSTNvariable.GetLocalTemporaryDirectory("Bentley")`

- **Design File Settings**

- `DesignFileSetting.GetMasterUnitName()`
- `DesignFileSetting.GetActiveAngle()`
- `DesignFileSetting.GetAxisAngle()`
- `DesignFileSetting.GetTagIncrement()`
- `DesignFileSetting.GetFenceClip()`
- `DesignFileSetting.GetFenceOverlap()`
- `DesignFileSetting.GetFenceVoid()`
- `DesignFileSetting.GetGridLock()`
- `DesignFileSetting.GetGridRef()`
- `DesignFileSetting.GetIsometricLock()`
- `DesignFileSetting.GetGraphicGroup()`
- `DesignFileSetting.GetSubUnitName()`
- `DesignFileSetting.GetAngleLock()`
- `DesignFileSetting.GetAngleTolerance()`
- `DesignFileSetting.GetSnapMode()`
- `DesignFileSetting.GetPointerColor()`
- `DesignFileSetting.GetHiLightColor()`
- `DesignFileSetting.GetScaleTolerance()`
- `DesignFileSetting.GetGridAspect()`
- `DesignFileSetting.GetGridOrientation()`
- `DesignFileSetting.GetSnapDivisor()`
- `DesignFileSetting.GetSnapAssociation()`
- `DesignFileSetting.GetIsoPlane()`
- `DesignFileSetting.GetStreamDelta()`
- `DesignFileSetting.GetStreamTol()`
- `DesignFileSetting.GetStreamAngle()`
- `DesignFileSetting.GetStreamArea()`

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- DesignFileSetting.GetStreamAcceptance()
- DesignFileSetting.GetSolidsArea()
- DesignFileSetting.GetAngleClockwise()
- DesignFileSetting.GetAngleBase()
- DesignFileSetting.GetActiveScaleX()
- DesignFileSetting.GetActiveScaleY()
- DesignFileSetting.GetAxisLock()
- DesignFileSetting.GetBackground(1)
- DesignFileSetting.GetPixelWidth(1)
- DesignFileSetting.GetPixelHeight(1)
- DesignFileSetting.GetSelectionSetClr()
- DesignFileSetting.GetSnapACSPPlane()
- DesignFileSetting.GetACSPPlaneLock()
- DesignFileSetting.GetScaleLock()
- DesignFileSetting.GetSnapLock()
- DesignFileSetting.GetLevelLock()
- **Active File**
  - ActiveFile.ACSPPlaneSnap
  - ActiveFile.ActiveAngle
  - ActiveFile.AngleLock
  - ActiveFile.Association
  - ActiveFile.Author
  - ActiveFile.AuthoringProductName
  - ActiveFile.AxisLock
  - ActiveFile.Client
  - ActiveFile.Comments
  - ActiveFile.ConnectProjectGUID
  - ActiveFile.CreateDate
  - ActiveFile.DesignRevisionCount
  - ActiveFile.DesignRevisions
  - ActiveFile.Editor
  - ActiveFile.FileName
  - ActiveFile.FileSize
  - ActiveFile.Format
  - ActiveFile.FormatMinorVersion
  - ActiveFile.GetClass()
  - ActiveFile.FormatMajorVersion
  - ActiveFile.GetInstanceId()
  - ActiveFile.GetInstanceLabel()
  - ActiveFile.GetRelatedInstance()
  - ActiveFile.Increment
  - ActiveFile.IsOfClass("Room","ExampleSchema.01.00")
  - ActiveFile.KeyPointDevisor
  - ActiveFile.Keywords
  - ActiveFile.LastSavedBy

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- ActiveFile.LevelLock
- ActiveFile.Levels
- ActiveFile.LevelsUsed
- ActiveFile.Manager
- ActiveFile.Models
- ActiveFile.Orientation
- ActiveFile.OriginalFileFormat
- ActiveFile.Owner
- ActiveFile.PlotDate
- ActiveFile.ProjectAssetType
- ActiveFile.ProjectIndustry
- ActiveFile.ProjectLocation
- ActiveFile.ProjectName
- ActiveFile.ProjectNumber
- ActiveFile.ProjectStatus
- ActiveFile.Revision
- ActiveFile.RevisionNumber
- ActiveFile.SaveDate
- ActiveFile.ScaleLock
- ActiveFile.Sheet\_Number
- ActiveFile.ScaleTolerance
- ActiveFile.SnapLock
- ActiveFile.SnapMode
- ActiveFile.StartAngle
- ActiveFile.Subject
- ActiveFile.Title
- ActiveFile.Tolerance
- ActiveFile.TotalEditingTime
- ActiveFile.WorkSetDescription
- ActiveFile.WorkSetName
- ActiveFile.WorkSpaceName
- ActiveFile.XActiveScale
- ActiveFile.YActiveScale
- ActiveFile.ZActiveScale
- **Session**
  - Session.IsActiveFileInCfgVarList("MS\_GUIDGNLIBLIST")
  - Session.IsV7DgnFile()
  - Session.IsDwgFile()
  - Session.IsDxfFile()
  - Session.IsReadOnlyFile()
  - Session.IsBentleyView()
  - Session.ItemBrowserInBentleyView()
  - Session.ActiveTaskType()
  - Session.ActiveWorkflow()
  - Session.AreCustomTasksAvailable()

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- Session.IsCustomTaskAvailable()
- Session.ActiveCommandKeyin()
- Session.IsMdlLoaded("PSELECT")
- Session.EvalNEAsDouble("1+2",3.7)
- Session.EvalNEAsInt("3+4",9)
- Session.EvalNEAsBool("false","true")
- Session.EvalNEAsString("a+b","abc")
- Session.TreatActiveModelAs3D()
- Session.ActiveModelIsReference()
- Session.ActiveModelIs3dPrintingModel()
- Session.ActiveModelIsMarkup()
- Session.ActiveModelTypeIsDesign()
- Session.ActiveModelTypeIsSheet()
- Session.ActiveModelTypeIsDrawing()
- Session.IsDisplaySetActive()
- Session.IsNamedToolBoxOpen("Extra Tools")
- Session.IsToolBoxOpen(-548,"MGDSHOOK")
- Session.IsToolFrameOpen(-548,"MGDSHOOK")
- Session.IsMdlDialogOpen()
- Session.IsViewDisplayed()
- Session.ActiveAnnotationScale()
- Session.IsSnapModeValid(2048)
- Session.ActiveSnapMode()
- Session.DefaultSnapMode()
- Session.IsProductLicensed(1000,"08.11.00..00")
- Session.IsAccuSnapEnabled()
- Session.GetTextElementJustification()
- Session.SetTextElementJustification()
- Session.GetSnapModeMenuMark(SnapMode.Keypoint)
- Session.IsUndoActive()
- Session.IsRedoActive()
- Session.UndoCommandString()
- Session.RedoCommandString()
- Session.IsContextualTabSetKeyActive()
- Session.IsUIItemStateEnabled("MyItem.Key",false)
- Session.IsUIItemStateEnabled("MyItem.Key",false)
- Session.IsUIItemStateChecked()
- Session.GetUIItemStateMenuMark("MyItem.Key")
- Session.IsSheetIndexReadOnly()
- Session.ActiveAnnotationScaleString()
- Session.ActiveAcsDescription()
- Session.ActiveFileAllowsExports()
- Session.ActiveFileAllowsPrinting()
- Session.ActiveFileIsScratch()
- Session.ActiveFileIsAConfiguredDgnlib()
- Session.IsTaskNavigationInRibbon()

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- Session.IsLevelManagerAllowed()
- **WorkSet**
  - WorkSet.ProjectName
  - WorkSet.ProjectIndustry
  - WorkSet.ProjectNumber
  - WorkSet.ConnectProjectGUID
  - WorkSet.ProjectAssetType
  - WorkSet.ProjectLocation
  - WorkSet.ProjectStatus
  - WorkSet.WorkSetDescription
  - WorkSet.WorkSetName
  - WorkSet.WorkSpaceName

**Note:** If you have added advanced properties while creating a Workspace, like custom date or custom text then you should use below expression:

WorkSet.CustomPropertyName

- **System.Date Time** (for this you have to create Date1 and Date2 properties in the Item Type)
  - System.DateTime.Now()
  - System.DateTime.GetYear(System.DateTime.Now())
  - System.DateTime.GetDateOnly(System.DateTime.Now())
  - System.DateTime.GetDayOfYear(System.DateTime.Now())
  - System.DateTime.GetMillisecond(System.DateTime.Now())
  - System.DateTime.GetSecond(System.DateTime.Now())
  - System.DateTime.GetMinute(System.DateTime.Now())
  - System.DateTime.GetHour(System.DateTime.Now())
  - System.DateTime.GetMonth(System.DateTime.Now())
  - System.DateTime.ToLocalTime(System.DateTime.Now())
  - System.DateTime.Compare(this.date1,this.date2)
  - System.DateTime.UtcNow()
  - System.DateTime.Equals(this.date1,this.date2)
  - System.DateTime.SubtractionInDays(this.date1,this.date2)
  - System.DateTime.SubtractionInYears(this.date1,this.date2)
  - System.DateTime.SubtractionInMonths(this.date1,this.date2)
  - System.DateTime.IsLeapYear(System.DateTime.Now())
- **System.Environment**
  - System.Environment.CurrentDirectory ()
  - System.Environment.ExpandEnvironmentVariables (name)
  - System.Environment.GetEnvironmentVariable (variable)
  - System.Environment.UserName ()
- **Active Lock**
  - ActiveLock.AngleLockEnabled()
  - ActiveLock.AnnotationScaleLockEnabled()
  - ActiveLock.AssociationLockEnabled()



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- `ActiveLock.ConstructionPlaneLockEnabled()`
- `ActiveLock.ConstructionSnapLockEnabled()`
- `ActiveLock.GraphicGroupLockEnabled()`
- `ActiveLock.GridLockEnabled()`
- `ActiveLock.IsometricLockEnabled()`
- `ActiveLock.LevelLockEnabled()`
- `ActiveLock.PatternAssociationLockEnabled()`
- `ActiveLock.SnapLockEnabled()`
- `ActiveLock.TextNodeLockEnabled()`
- `ActiveLock.UnitLockEnabled()`
- `ActiveLock.ElementTemplateAssociationLockEnabled()`
- **Active View**
  - `ActiveView.DisplayStyleName()`
  - `ActiveView.UseCamera()`
  - `ActiveView.ShowFill()`
  - `ActiveView.ShowACSTriad()`
  - `ActiveView.ShowBackground()`
  - `ActiveView.ShowBoundaryDisplay()`
  - `ActiveView.UseClipBack()`
  - `ActiveView.UseClipFront()`
  - `ActiveView.UseClipVolume()`
  - `ActiveView.ShowConstructionClass()`
  - `ActiveView.ShowDimensionClass()`
  - `ActiveView.ShowDataFields()`
  - `ActiveView.UseDisplaySet()`
  - `ActiveView.ShowFastCells()`
  - `ActiveView.ShowFastCurves()`
  - `ActiveView.ShowGrid()`
  - `ActiveView.UseLevelOverrides()`
  - `ActiveView.ShowLineStyle()`
  - `ActiveView.ShowLineWeight()`
  - `ActiveView.ShowPatternBumpMaps()`
  - `ActiveView.UseDefaultLighting()`
  - `ActiveView.ShowTags()`
  - `ActiveView.ShowText()`
  - `ActiveView.ShowTextNodes()`
  - `ActiveView.ShowTransparency()`
  - `ActiveView.UsesClipVolumeElement()`
- **Active Model**
  - `ActiveModel.Name`
  - `ActiveModel.Type`
  - `ActiveModel.IsActive`
  - `ActiveModel.Is3D`
  - `ActiveModel.TreatAs3D`
  - `ActiveModel.CellType`

- ActiveModel.Description
- ActiveModel.DefaultRefLogical
- ActiveModel.PropagateAnnotationScale
- ActiveModel.AnnotationScale
- ActiveModel.ModelId
- ActiveModel.Hidden
- ActiveModel.IsMarkup
- ActiveModel.CanbePlacedAsCell
- ActiveModel.IsMaster
- ActiveModel.UpdateFieldsAutomatically
- ActiveModel.CanbePlacedAsAnnotationCel
- ActiveModel.LineStyleScale
- ActiveModel.Format
- ActiveModel.MasterUnit
- ActiveModel.SubUnit
- ActiveModel.Accuracy
- ActiveModel.MasterUnitLabel
- ActiveModel.SubUnitLabel
- ActiveModel.GlobalLineStyleScaleFactor
- ActiveModel.DesignScale
- ActiveModel.PaperScale
- ActiveModel.AngleReadoutFormat
- ActiveModel.AngleReadoutAccuracy
- ActiveModel.DirectionMode
- ActiveModel.DirectionBase
- ActiveModel.Direction
- ActiveModel.GridLock
- ActiveModel.GridMaster
- ActiveModel.GridReference
- ActiveModel.GridConfig
- ActiveModel.GridAspect
- ActiveModel.IsometricLock
- ActiveModel.IsometricPlane
- ActiveModel.ACSPlane
- ActiveModel.Resolution
- ActiveModel.WorkingArea
- ActiveModel.SolidArea
- ActiveModel.SolidAccuracy