Goldmember: 99 Must-Know Methods and Properties of the SolidWorks® API

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The fastest way to learn the SolidWorks® API



Presentation Format

Rather than simply talking about the 99 must-know methods, it would be more useful to see them demonstrated. In this presentation, we will consider a case study that will allow us to use all 99 methods in one single macro.

Case Study

Imagine that you are a lead design engineer for XYZ Corporation, which designs machine components for various industries. Lately you have been placed on a team that creates a simple crank mechanism based on customer specifications. The crank consists of a shaft, arm, and handle. Material options include steel or aluminum. The shaft and arm are chosen by the customer and assembled by a co-worker. You are then tasked with creating the handle component, adding the handle to the assembly, ensuring that safety standards are met in the arm and handle design, creating the final drawing, and then saving it all out as a pack and go .ZIP file, which another engineer will pass on to the manufacturer. Since the only handle specifications that differ from customer to customer are based on the specifications of the arm component, you realize that the entire process can be automated.

Preconditions

- The arm component must have two faces named for automating the mating process
- The company part template must be open, which contains an “Author” custom property

Macro specifications

- Allow the user to browse for the location of the partially complete assembly
- Check to make sure that a part is open before running
- Create the handle with these default specifications
    - 35mm length
    - 10mm diameter for all but the last 5mm, which is a 5mm diameter
    - 1mm fillet on the main cylindrical face
    - Two configurations
        - “Aluminum” has material of 1060 Alloy
        - “Steel” has material of Plain Carbon Steel
    - “Author” custom property set equal to author’s initials
    - “Description” custom property with part number
- Add and mate handle component to partially complete assembly
- Ensure that the arm and handle dimensions meet product safety standards
    - For steel components
        - The current arm length is used
        - The handle length is 0.35 * the arm length
    - For aluminum components
        - 0.75 * the current arm length is used
        - The handle length is 0.45 * the arm length
- Save the assembly in an isometric view, zoomed to fit
- Drawing
    - First sheet: isometric view of the assembly, balloons, BOM
    - Subsequent sheets: one for each component visible the iso view from the first sheet; standard 3-view layout, dimensioned
- Create pack and go in same folder as partially completed assembly
- Print pack and go .ZIP path to a text box, where it can be copied easily
- Close all documents when finished

Members list (presented in the order they are used)

The macro presented is divided into roughly three sections: parts, assemblies, and drawings. Please note that this case study contains many artificial or superficial constraints so as to accommodate the presentation of as many API calls (members) as possible. A more realistic version of this macro would probably require only 300 lines of code, as opposed to the nearly 500 present.

1. ISldWorks::GetOpenFileName
2. ISldWorks::SendMsgToUser2
3. IModelDoc2::ActiveDoc
4. IModelDoc2::GetType
5. IModelDoc2::ActiveView
6. IModelView::EnableGraphicsUpdate
7. ISketchManager::AddToDB
8. ISldWorks::SetUserPreferenceToggle
9. IModelDocExtension::SelectByID2
10. ISketchManager::InsertSketch
11. ISketchManager::CreateCircleByRadius
12. IModelDoc2::AddDimension2
13. IFeatureManager::FeatureExtrusion2
14. IModelDoc2::FirstFeature
15. IFeature::GetTypeName
16. IFeature::GetNextFeature
17. IFeature::Select2
18. IFeatureManager::FeatureCut3
19. IPartDoc::GetBodies2
20. IBody2::GetFaces
21. IFace2::GetSurface
22. ISurface::IsCylinder
23. IFace2::GetArea
24. IEntity::Select4
25. IFeatureMananger::FeatureFillet
26. IPartDoc::SetEntityName
27. IBody2::GetEdges
28. IEdge::GetCurveParams3
29. ICurveParamData::StartPoint
30. IModelDoc2::AddConfiguration3
31. IModelDoc2::DeleteConfiguration2
32. IPartDoc::SetMaterialPropertyName2
33. IModelDocExtension::SetMaterialPropertyValues
34. IModelDocExtension::CustomPropertyManager
35. ICustomPropertyManager::GetNames
36. ICustomPropertyManager::Get3
37. ICustomPropertyManager::Set
38. ICustomPropertyManager::Add2
39. IModelDocExtension::SaveAs
40. IModelDoc2::OpenDoc6
41. IAssemblyDoc::AddComponent4
42. IAssemblyDoc::GetComponentByName
43. IComponent2::GetBodies3
44. IModelDoc2::GetEntityName
45. IAssemblyDoc::AddMate3
46. IAssemblyDoc::GetComponents

47. IEntity::GetComponent
48. IComponent2::ReferencedConfiguration
49. IComponent2::FeatureByName
50. IComponent2::Select4
51. IAssemblyDoc::EditPart2
52. IFeature::GetDefinition
53. IExtrudeFeatureData2::GetDepth
54. IExtrudeFeatureData2::SetDepth
55. IFeature::ModifyDefinition
56. IAssemblyDoc::EditAssembly
57. IComponent2::GetModelDoc2
58. IModelDoc2::SelectionManager
59. ISelectionManager::GetSelectedObjectType3
60. ISelectionManager::GetSelectedObject6
61. IDisplayDimension::GetDimension2
62. IDimension::SetSystemValue3
63. IModelDoc2::ForceRebuild3
64. IModelDoc2::ShowNamedView2
65. IModelDoc2::ViewZoomtofit2
66. ISldWorks::GetUserPreferenceStringValue
67. ISldWorks::NewDocument
68. IDrawingDoc::SetupSheet5
69. IDrawingDoc::CreateDrawViewFromModelView3
70. IDrawingDoc::ViewDisplayShaded
71. IView::ScaleDecimal
72. IDrawingDoc::FeatureByName
73. IDrawingDoc::AutoBalloon4
74. INote::GetAnnotation
75. IAnnotation::GetPosition
76. IAnnotation::SetPosition
77. IView::InsertBomTable3
78. IView::GetVisibleComponents
79. IDrawingDoc::NewSheet3
80. IDrawingDoc::GetSheetNames
81. IDrawingDoc::Sheet
82. IDrawingDoc::ActivateSheet
83. ISheet::SetName
84. IComponent2::Name2
85. IDrawingDoc::Create3rdAngleViews2
86. ISheet::GetViews
87. IView::GetReferencedModelName
88. IView::ReferencedConfiguration
89. IDrawingDoc::InsertModelAnnotations3
90. IModelDoc2::ClearSelection2
91. IView::GetFirstDisplayDimension5
92. IDisplayDimension::GetNameForSelection
93. IDisplayDimension::GetNext5
94. IModelDocExtension::AlignDimensions
95. IModelDocExtension::GetPackAndGo
96. IModelDoc2::GetPathName
97. IPackAndGo::SetSaveToName
98. IModelDocExtension::SavePackAndGo
99. ISldWorks::CloseAllDocuments