```
''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''
' TestAnalysisTools.rvb -- May 2009, Dale Fugier.
' This RhinoScipt file documents the RhinoScript callable function
' included in AnalysisTools.rhp.
' Works with Rhino 4.0.
''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''
Option Explicit

''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''
' Function:
'   IsAnalysisMesh
' Description:
'   Verifies that a mesh object is an analysis mesh.
' Parameters:
'   strMesh  - Required, String. The identifier of the object test.
' Returns:
'   Boolean  - True if an analysis mesh, False otherwise.
'   Null     - On error;
''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''
Sub TestIsAnalysisMesh()

  Const rhMesh = 32
  Dim objAnalysis, strMesh

  On Error Resume Next
  Set objAnalysis = Rhino.GetPluginObject("Analysis Tools")
  If Err Then
    Rhino.Print "Unable to connect to AnalysisTools plug-in."
    Exit Sub
  End If

  strMesh = Rhino.GetObject("Select mesh", rhMesh, True)
  If IsNull(strMesh) Then Exit Sub

  If objAnalysis.IsAnalysisMesh(strMesh) Then
    Rhino.Print "Mesh is an analysis mesh."
  Else
    Rhino.Print "Mesh is not an analysis mesh."
  End If

End Sub

''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''
' Function:
'   AddAnalysisMesh
' Description:
'   Adds a new analysis mesh.
' Parameters:
'   arrVertices - Required. Array.  An array of 3-D points defining the
'                 vertices of the mesh.
'   arrFaces    - Required, Array. An array containing arrays of four
'                 numbers that define the vertex indices for each face of
'                 the mesh. If the third and forth vertex indices of a face
'                 are identical, a triangular face will be created. Otherwise
'                 a quad face will be created.
'   arrData     - Required, Array. An array of analysis data (numbers).
'                 Note, For every mesh vertex, there must be corresponding
'                 analysis data.
' Returns:
'   String      - The identifier of the new object if successful.
'   Null        - If not successful, or on error.
''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''
Sub TestAddAnalysisMesh()

  Dim objAnalysis, arrVertices(8), arrFaces(7), arrData(8)

  On Error Resume Next
  Set objAnalysis = Rhino.GetPluginObject("Analysis Tools")
  If Err Then
    Rhino.Print "Unable to connect to AnalysisTools plug-in."
    Exit Sub
  End If

  arrVertices(0) = Array(0.0, 0.0, 0.0)
  arrVertices(1) = Array(5.0, 0.0, 0.0)
  arrVertices(2) = Array(10.0, 0.0, 0.0)
  arrVertices(3) = Array(0.0, 5.0, 0.0)
  arrVertices(4) = Array(5.0, 5.0, 0.0)
  arrVertices(5) = Array(10.0, 5.0, 0.0)
  arrVertices(6) = Array(0.0, 10.0, 0.0)
  arrVertices(7) = Array(5.0, 10.0, 0.0)
  arrVertices(8) = Array(10.0, 10.0, 0.0)

  arrFaces(0) = Array(0,1,4,4)
  arrFaces(1) = Array(2,4,1,1)
  arrFaces(2) = Array(0,4,3,3)
  arrFaces(3) = Array(2,5,4,4)
  arrFaces(4) = Array(3,4,6,6)
  arrFaces(5) = Array(5,8,4,4)
  arrFaces(6) = Array(6,4,7,7)
  arrFaces(7) = Array(8,7,4,4)

  arrData(0) = 0.0
  arrData(1) = 5.0
  arrData(2) = 10.0
  arrData(3) = 0.0
  arrData(4) = 5.0
  arrData(5) = 10.0
  arrData(6) = 0.0
  arrData(7) = 5.0
  arrData(8) = 10.0

  objAnalysis.AddAnalysisMesh arrVertices, arrFaces, arrData

End Sub

'''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''
' Function:
'   AnalysisMeshData
' Description:
'   Returns or modifies the data associated with an analysis mesh.
'   Note, if the specified mesh is not an analysis mesh, it will be
'   converted to an analysis mesh.
' Parameters:
'   strMesh  - Required, String. The identifier of an existing analysis mesh.
'   arrData  - Optional, Array. An array of analysis data (numbers).
'              Note, For every mesh vertex, there must be corresponding
'              analysis data.
' Returns:
'   Array    - If arrData is not specified, then the current analysis data.
'   Array    - If arrData is specified, then the previous analysis data.
'   Null     - On error;
'''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''
Sub TestAnalysisMeshData()

  Const rhMesh = 32
  Dim objAnalysis, strMesh, arrVertices, arrData(), i

  On Error Resume Next
  Set objAnalysis = Rhino.GetPluginObject("Analysis Tools")
  If Err Then
    Rhino.Print "Unable to connect to AnalysisTools plug-in."
    Exit Sub
  End If

  strMesh = Rhino.GetObject("Select mesh", rhMesh, True)
  If IsNull(strMesh) Then Exit Sub

  arrVertices = Rhino.MeshVertices(strMesh)
  ReDim arrData(UBound(arrVertices))
  For i = 0 To UBound(arrVertices)
    arrData(i) = arrVertices(i)(2)
  Next

  objAnalysis.AnalysisMeshData strMesh, arrData

End Sub

'''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''
' Function:
'   AnalysisMeshDataRange
' Description:
'   Returns the min/max data range.
' Parameters:
'   strMesh  - Required, String. The identifier of an existing analysis mesh.
' Returns:
'   Array    - The min/max data range.
'   Null     - On error;
'''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''
Sub TestAnalysisMeshDataRange()

  Const rhMesh = 32
  Dim objAnalysis, strMesh, arrRange

  On Error Resume Next
  Set objAnalysis = Rhino.GetPluginObject("Analysis Tools")
  If Err Then
    Rhino.Print "Unable to connect to AnalysisTools plug-in."
    Exit Sub
  End If

  strMesh = Rhino.GetObject("Select mesh", rhMesh, True)
  If IsNull(strMesh) Then Exit Sub

  If objAnalysis.IsAnalysisMesh(strMesh) Then
    arrRange = objAnalysis.AnalysisMeshDataRange(strMesh)
    Rhino.Print "Parameter varies from " & CStr(arrRange(0)) & " to " & CStr(arrRange(1)) & "."
  Else
    Rhino.Print "Mesh is not an analysis mesh."
  End If

End Sub

'''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''
' Function:
'   AnalysisMeshDisplayRange
' Description:
'   Returns or modifies an analysis meshes min/max display range.
' Parameters:
'   strMesh  - Required, String. The identifier of an existing analysis mesh.
'   arrRange - Optional, Array. An array of two numbers that identify the
'              new min/max display range.
' Returns:
'   Array    - If arrRange is not specified, then the current min/max display range.
'   Array    - If arrRange is specified, then the previous min/max display range.
'   Null     - On error;
'''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''
Sub TestAnalysisMeshDisplayRange()

  Const rhMesh = 32
  Dim objAnalysis, strMesh, arrRange

  On Error Resume Next
  Set objAnalysis = Rhino.GetPluginObject("Analysis Tools")
  If Err Then
    Rhino.Print "Unable to connect to AnalysisTools plug-in."
    Exit Sub
  End If

  strMesh = Rhino.GetObject("Select mesh", rhMesh, Truu)
  If IsNull(strMesh) Then Exit Sub

  If objAnalysis.IsAnalysisMesh(strMesh) Then
    arrRange = objAnalysis.AnalysisMeshDisplayRange(strMesh)
    Rhino.Print "Parameter varies from " & CStr(arrRange(0)) & " to " & CStr(arrRange(1)) & "."
    ' Reset
    objAnalysis.AnalysisMeshDisplayRange strmesh, objAnalysis.AnalysisMeshDataRange(strMesh)
  Else
    Rhino.Print "Mesh is not an analysis mesh."
  End If

End Sub
```