核醫影像分析軟體設計應用經驗分享

台中榮總 核醫科

黃蒲蓉放射師

2019/09/07

Outline

Introduction	Code	Aladdin interface	Procedures	Doing
Α	Β	Γ	Δ	Ε
介紹 阿拉丁	程式碼 相關介紹	阿拉丁 介面使用	操作 流程畫面	實際 操作

Introduction

Introduction | Code | Aladdin interface | Procedures | Doing

A

B

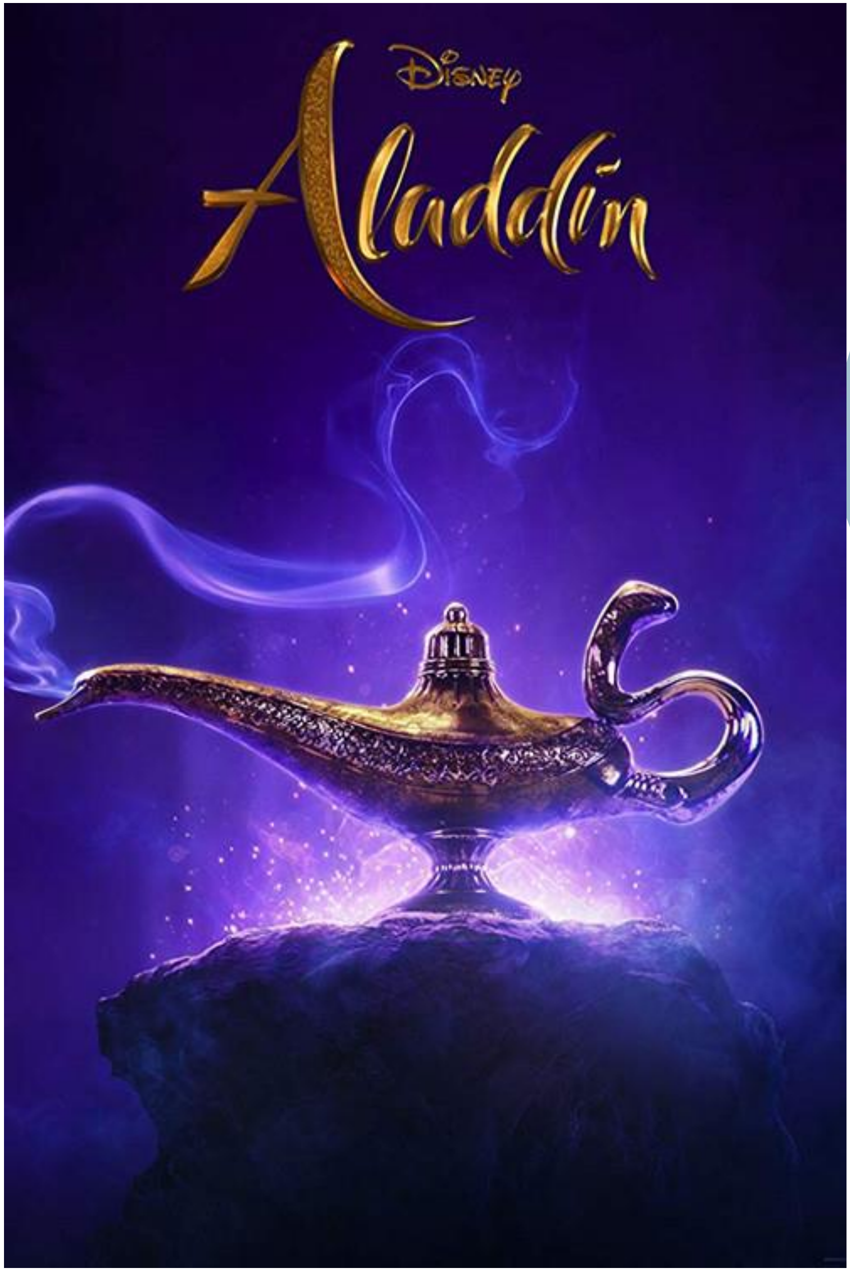
Γ

Δ

E

介紹
阿拉丁

何謂阿拉丁???



Disney裡
的阿拉丁
只有3個願望

GE Aladdin 可以有很多選擇

Aladdin是核醫影像分析軟體，提供程式化的方式處理常用之影像處理程序，應用在Xeleris workstation上。

程式化優點在於快速規劃各種常用的核醫臨床應用程序，如image display、ROI、TAC 等。

1. 可修改Xeleris 原有之程式

2. 可自行設計適當的程式

Code

Introduction | Code | Aladdin interface | Procedures | Doing

Α

Β

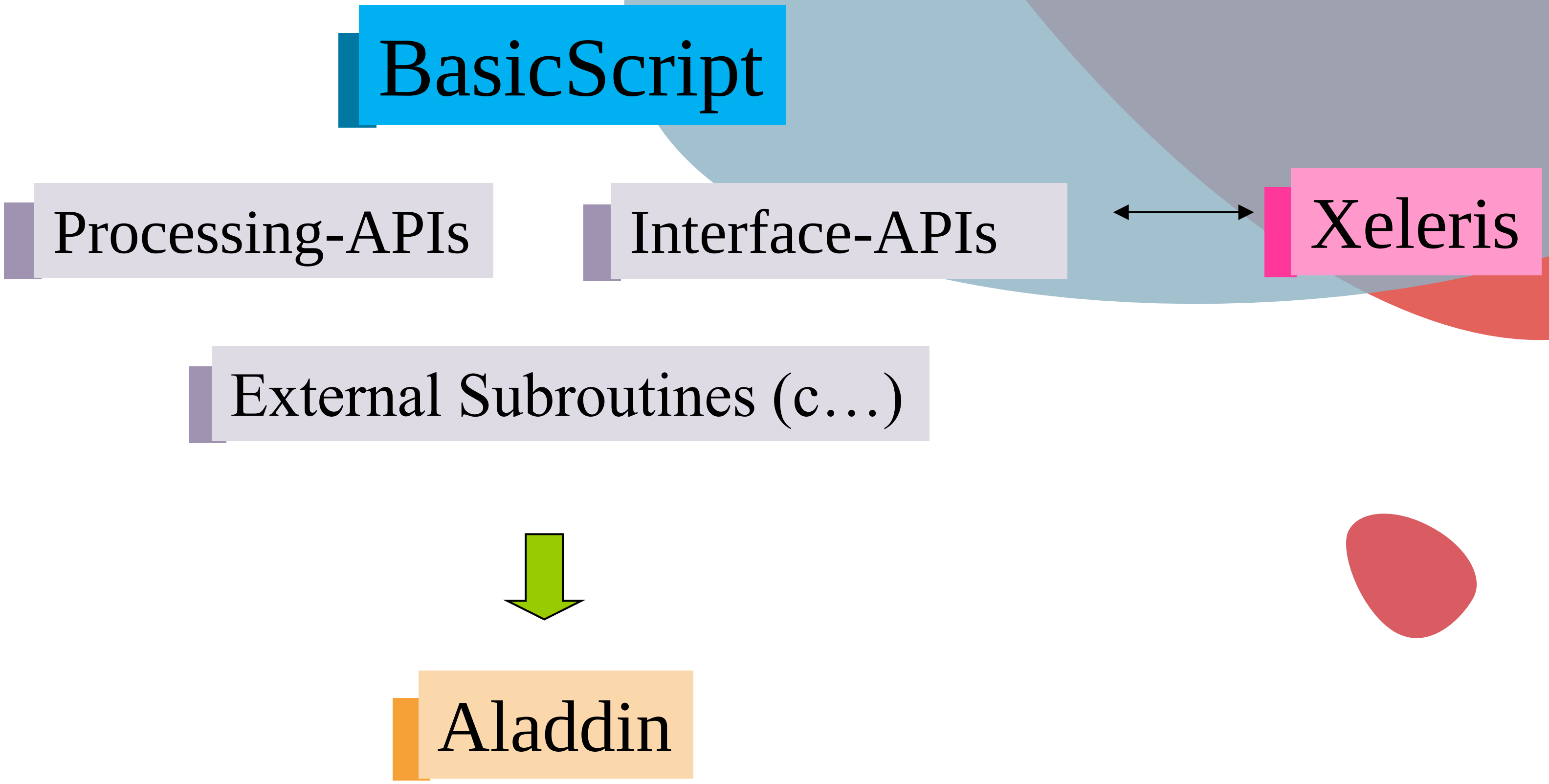
Γ

Δ

Ε

程式碼
相關介紹

Aladdin的架構



BasicScript

Processing-APIs

Interface-APIs ↔ Xeleris

External Subroutines (c…)

Aladdin

Program design

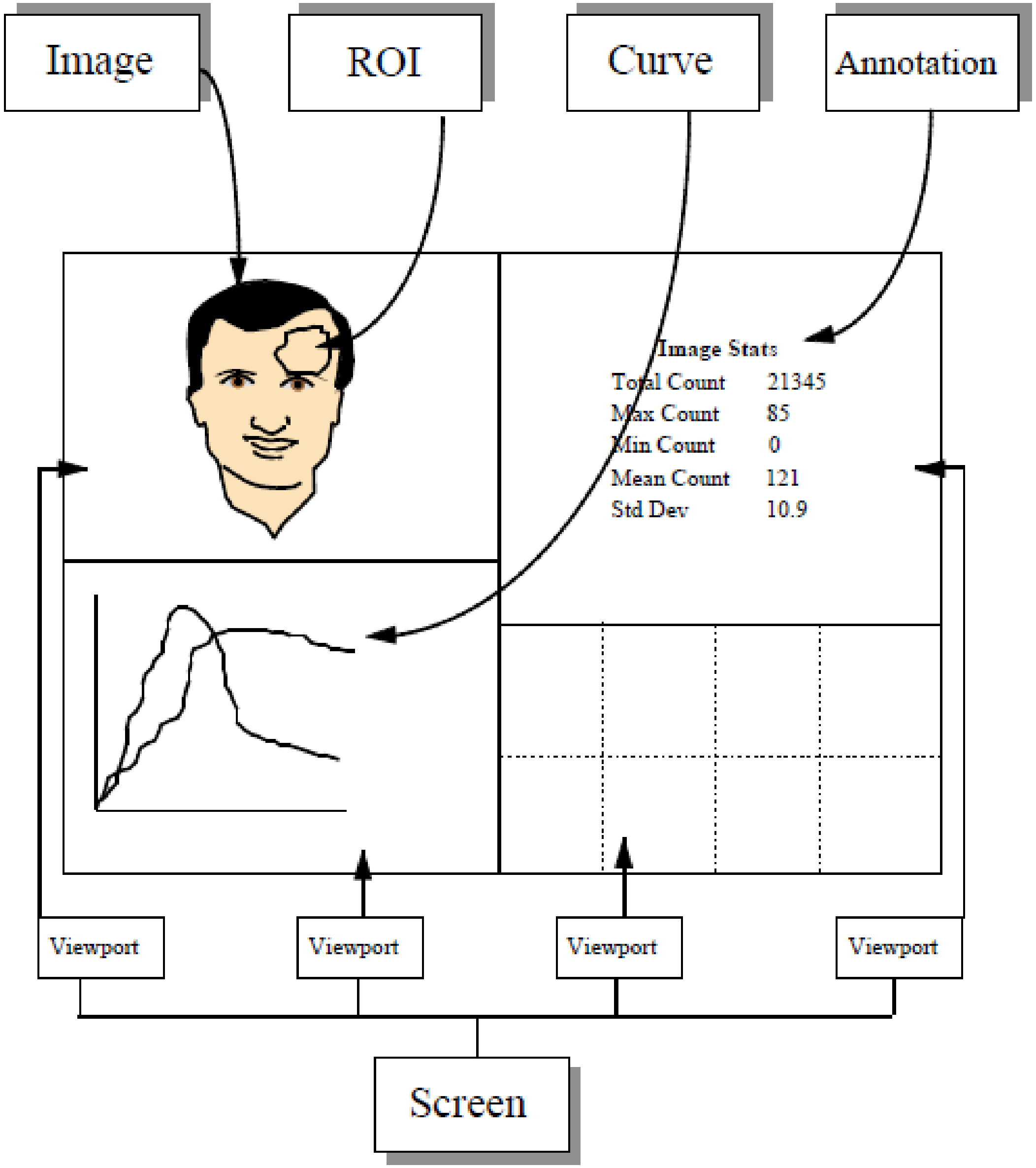
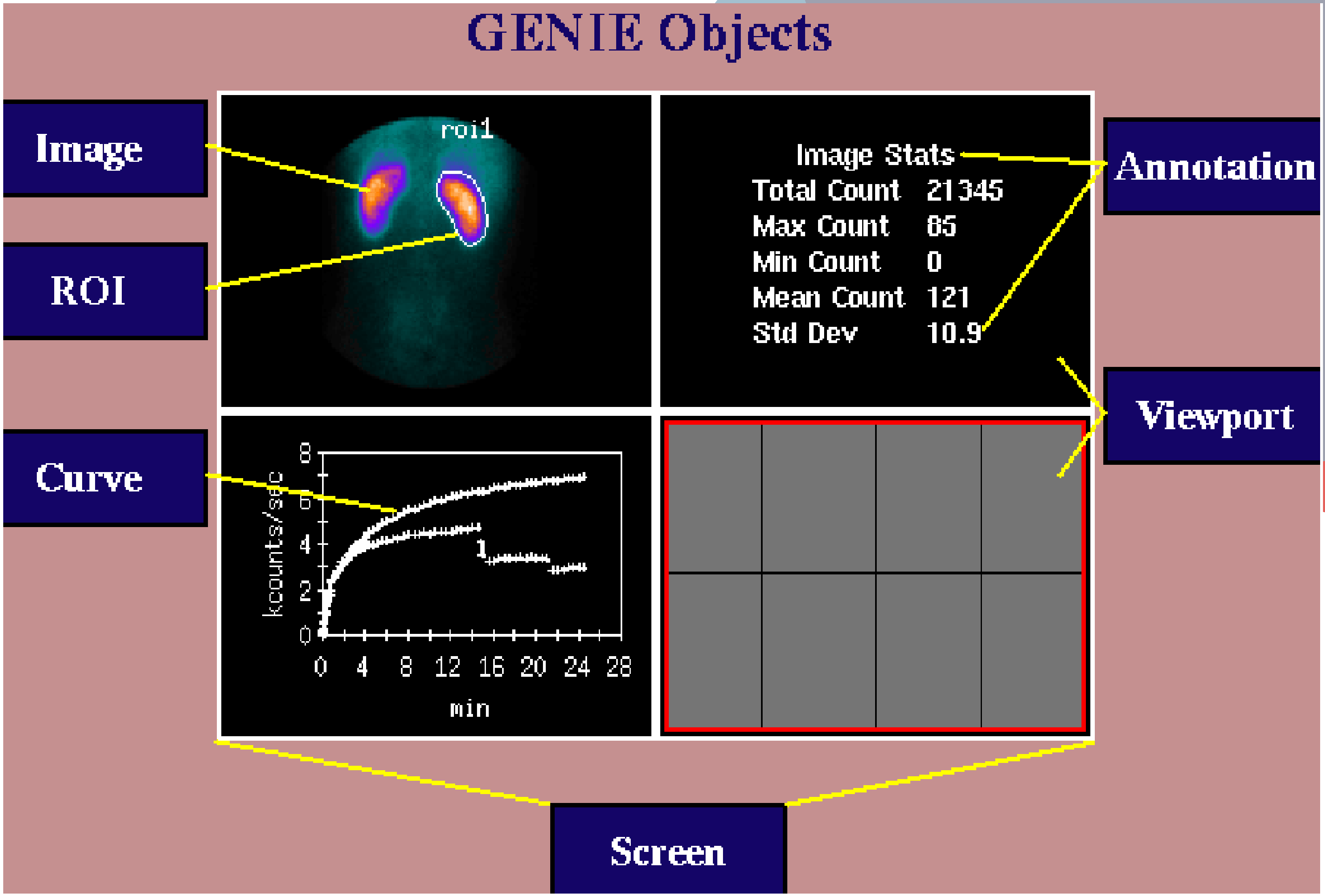


Image Stats

Total Count	21345
Max Count	85
Min Count	0
Mean Count	121
Std Dev	10.9

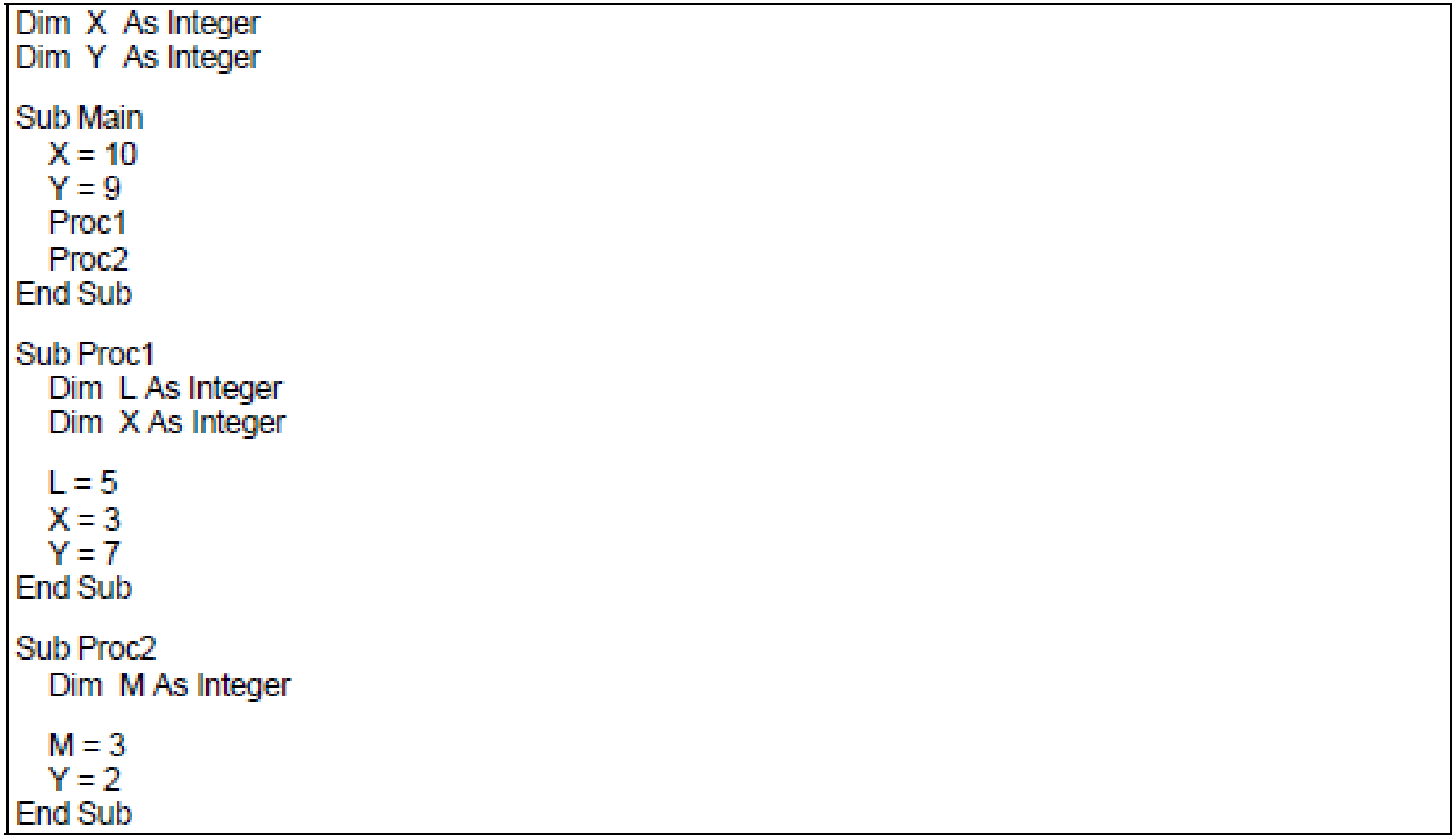
Program design



GENIE Objects

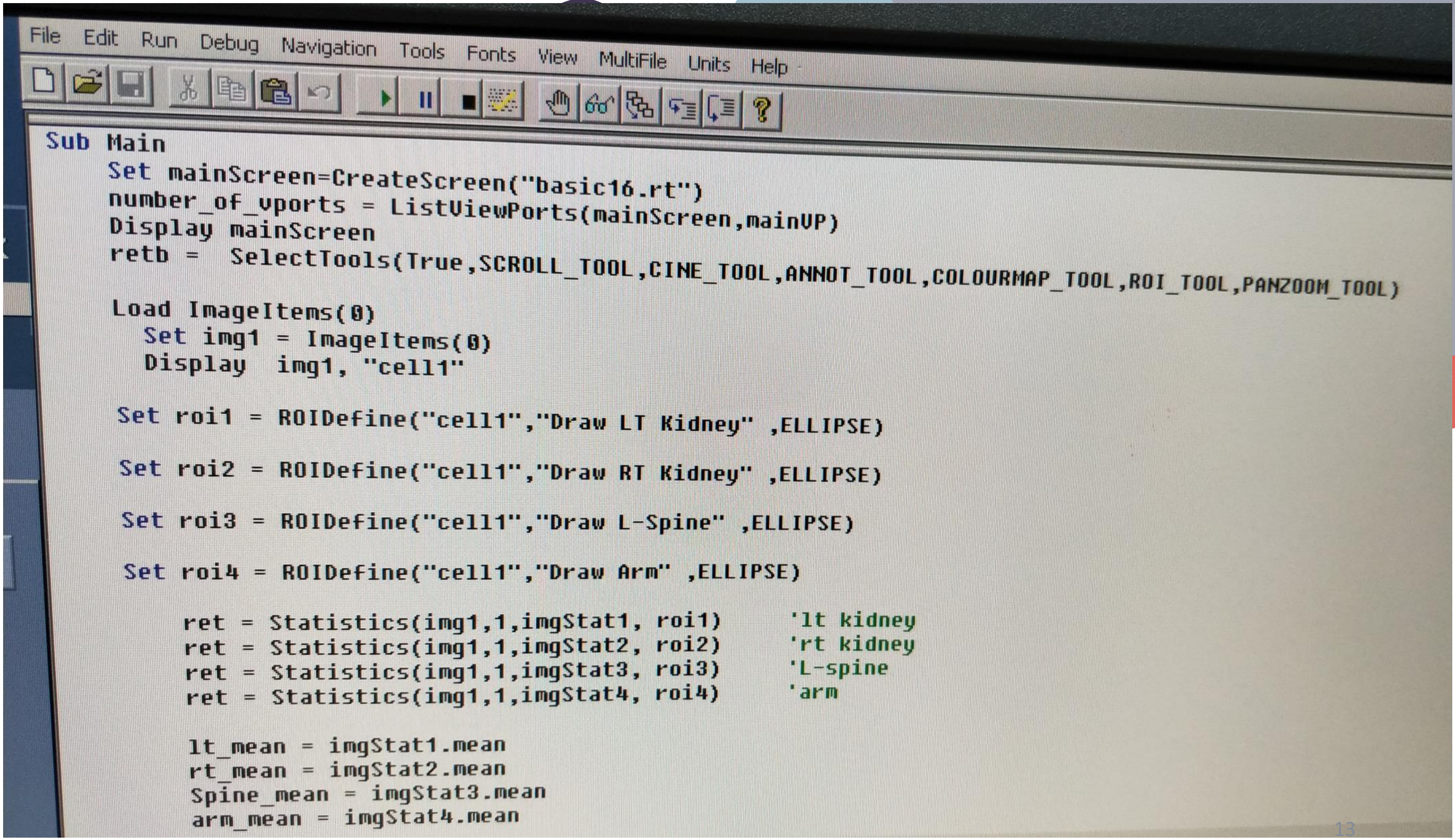
Image Stats	
Total Count	21345
Max Count	85
Min Count	0
Mean Count	121
Std Dev	10.9

Program design



```
Dim  X  As Integer
Dim  Y  As Integer

Sub Main
   X = 10
   Y = 9
   Proc1
   Proc2
End Sub

Sub Proc1
   Dim  L As Integer
   Dim  X As Integer

   L = 5
   X = 3
   Y = 7
End Sub

Sub Proc2
   Dim  M As Integer

   M = 3
   Y = 2
End Sub
```

Program design



```
Sub Main
    Set mainScreen=CreateScreen("basic16.rt")
    number_of_vports = ListViewPorts(mainScreen,mainVP)
    Display mainScreen
    retb =  SelectTools(True,SCROLL_TOOL,CINE_TOOL,ANNOT_TOOL,COLOURMAP_TOOL,ROI_TOOL,PANZOOM_TOOL)

    Load ImageItems(0)
       Set img1 = ImageItems(0)
       Display  img1, "cell1"

    Set roi1 = ROIDefine("cell1","Draw LT Kidney" ,ELLIPSE)

    Set roi2 = ROIDefine("cell1","Draw RT Kidney" ,ELLIPSE)

    Set roi3 = ROIDefine("cell1","Draw L-Spine" ,ELLIPSE)

    Set roi4 = ROIDefine("cell1","Draw Arm" ,ELLIPSE)

        ret = Statistics(img1,1,imgStat1, roi1)      'lt kidney
        ret = Statistics(img1,1,imgStat2, roi2)      'rt kidney
        ret = Statistics(img1,1,imgStat3, roi3)      'L-spine
        ret = Statistics(img1,1,imgStat4, roi4)      'arm

        lt_mean = imgStat1.mean
        rt_mean = imgStat2.mean
        Spine_mean = imgStat3.mean
        arm_mean = imgStat4.mean
```

相關的程式碼

- ✓ **AddNotify (Locator and ROI statement)**

  AddNotify locObject, callbackName [, CBReason]

- ✓ **Annot (Xeleris object)**

  The Annot object manages annotations associated with an image or an image viewport.

- ✓ **CreateLocator (Locator function)**

  Set loc = CreateLocator (curveID, nameString [, startPos])

- ✓ **Profile (Xeleris Curve function)**

  Set outputCurve = Profile(image, position, thickness, direction [, [outputName] [, frameNumber]])

- ✓ **GetAttribValue (Xeleris DataBase function)**

  retIndex = GetAttribValue(databaseObject, attributeName, attributeValue, index)

相關的程式碼

✓**GetViewport (Xeleris Viewport function)**

```
Set viewport = GetViewport(cellName)
```

✓**ListViewports (Xeleris Viewport function)**

```
viewportNumber = ListViewports(screen, viewportList)

viewportNumber = ListViewports(viewportList [, screen]
```

✓**ROIDefine (Xeleris ROI function)**

```
Set roi = ROIDefine(cellName, prompt, roiType [, roiLabel, tabNumber])

Set roi = ROIDefine(cellNameList, prompt, roiType [, roiLabel, tabNumber])

Set roi = ROIDefine(cellName, prompt, roiType, buttonPressed [, roiLabel,
tabNumber])

Set roi = ROIDefine(cellNameList, prompt, roiType, buttonPressed {,
roiLabel, tabNumber])
```

Aladdin Interface

Introduction	Code	Aladdin interface	Procedures	Doing
Α	Β	Γ	Δ	Ε
		阿拉丁 介面使用		

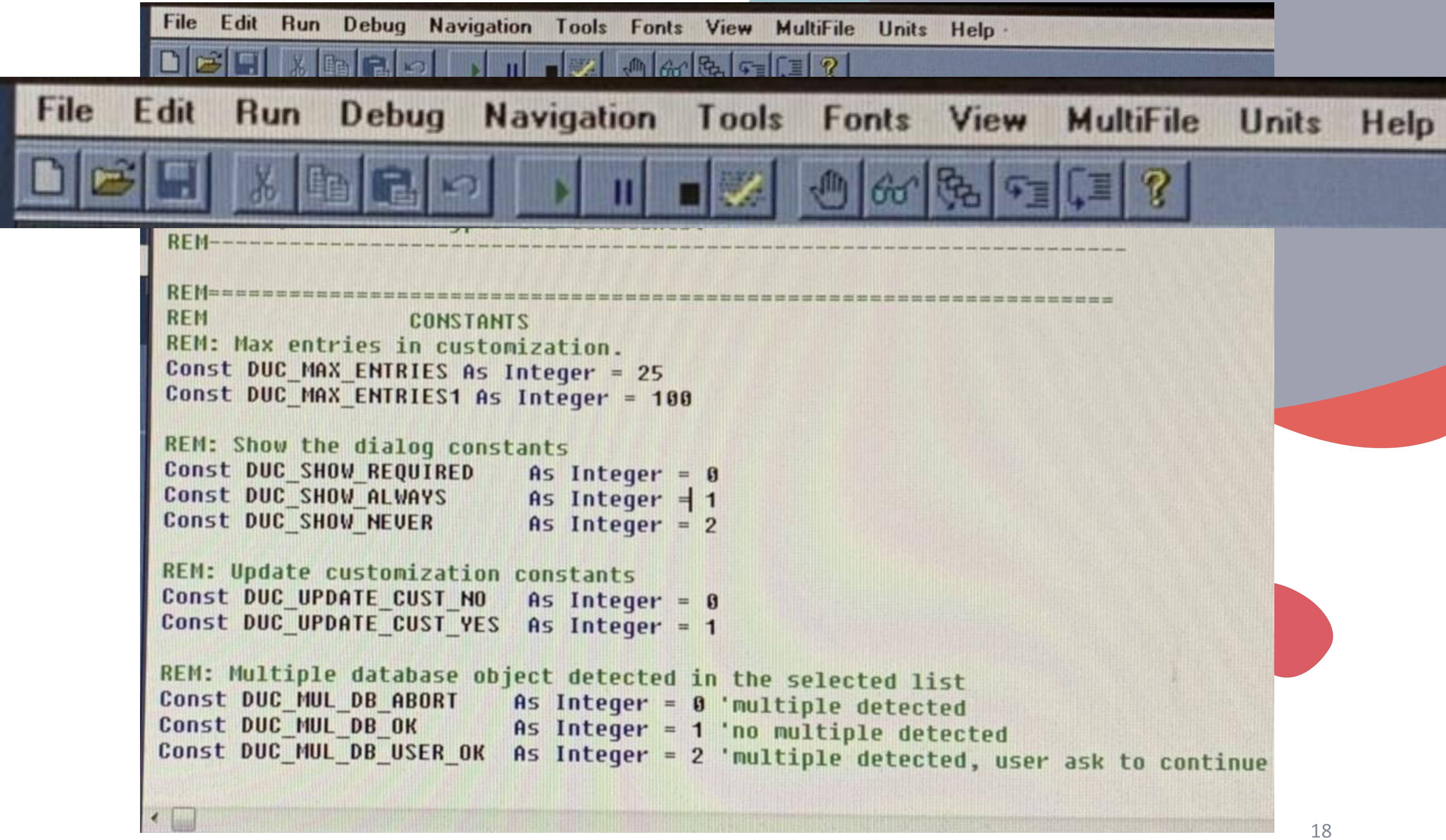
Aladdin的優勢

- 可以快速編輯且可交互式測試程式-簡便
- 程式設計方式易學且編寫介面人性化-靈活
- 豐富的工具-高效率 ：

基本元件：Aladdin card, Script editor,
ON-LINE help, Record tool

高階元件：Script debugger, Review template
editor (RTE),Navigation UI builder

Aladdin Card

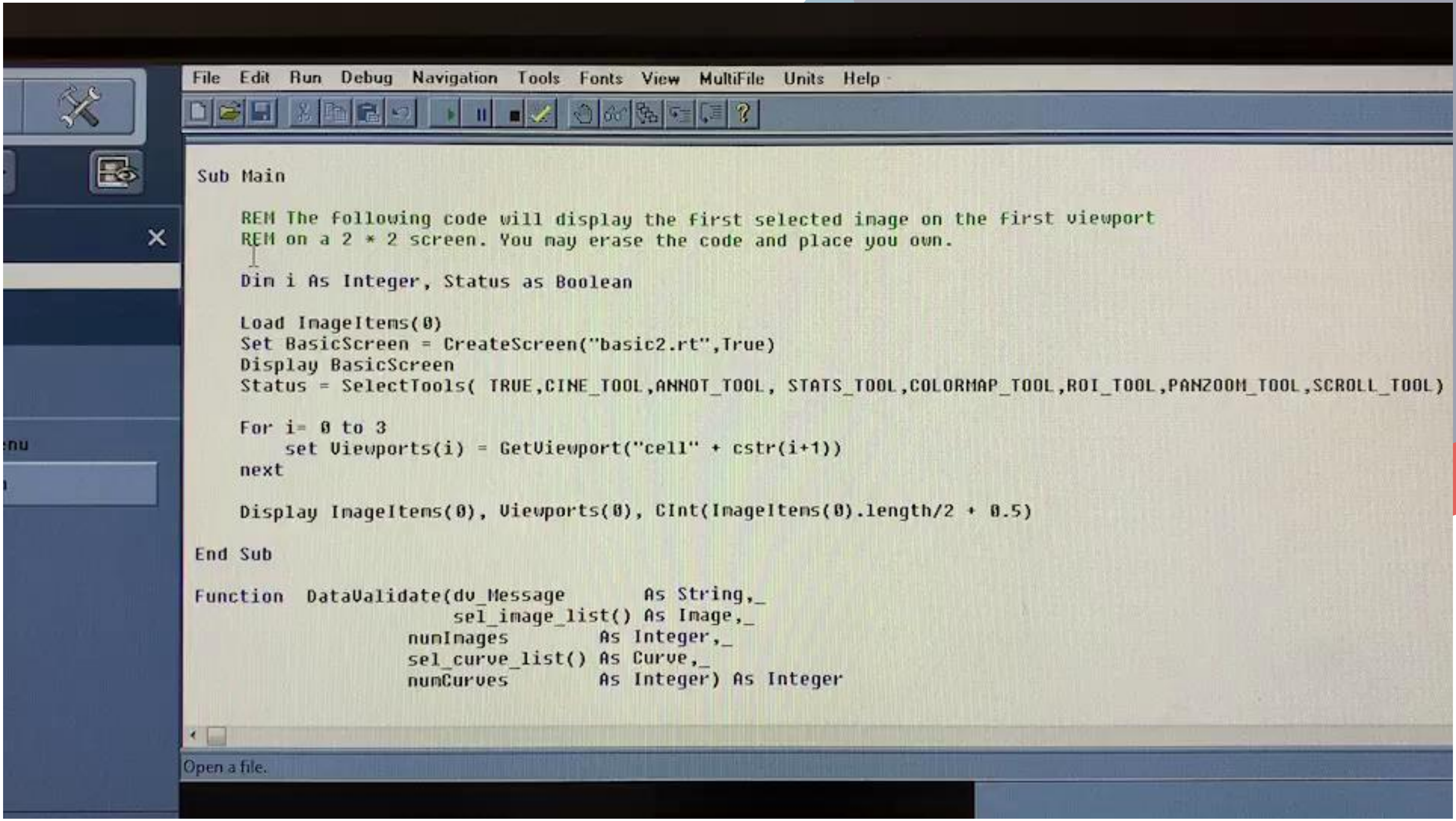


```
REM---------------------------------------------------------------------------

REM=========================================================================
REM                    CONSTANTS
REM: Max entries in customization.
Const DUC_MAX_ENTRIES As Integer = 25
Const DUC_MAX_ENTRIES1 As Integer = 100

REM: Show the dialog constants
Const DUC_SHOW_REQUIRED     As Integer = 0
Const DUC_SHOW_ALWAYS       As Integer = 1
Const DUC_SHOW_NEVER        As Integer = 2

REM: Update customization constants
Const DUC_UPDATE_CUST_NO    As Integer = 0
Const DUC_UPDATE_CUST_YES   As Integer = 1

REM: Multiple database object detected in the selected list
Const DUC_MUL_DB_ABORT     As Integer = 0 'multiple detected
Const DUC_MUL_DB_OK        As Integer = 1 'no multiple detected
Const DUC_MUL_DB_USER_OK   As Integer = 2 'multiple detected, user ask to continue
```

程式編輯的基本步驟

1. 建構並記錄程式邏輯架構
2. 定義需要的参数（如image、ROI等）
3. 把邏輯架構內容分解到子程式或主程式
4. 用编輯工具编寫程式
5. 定義tab和buttom並與子程式聯結
6. 檢查參數格式
7. 存檔
8. 用患者選擇工具選一組data
9. 執行程式
10. 調整程式
11. 安装到xeleris
12. 退出Aladdin
13. 在xeleris 上執行程式

```
Sub Main
  Set mainScreen=CreateScreen("proscript1.rt")
  number_of_vports = ListViewPorts(mainScreen,mainVP)
  Display mainScreen
  retb =  SelectTools(True,PANZOOM_TOOL,ANNOT_TOOL,COLOURMAP_TOOL,ROI_TOOL)
    Load ImageItems(0)
   Set newImage1 = ImageItems(0)
   Display  newImage1, "cell_1"
        Set vp1 = GetViewport("cell_1")
               vp1.selectedcell = true
        Set vp2 = GetViewport("cell_2")
Rem   Create a viewport Locator
        Set locx = CreateLocator( vp1, True )
               locx.ypos = 20    Set locx2 = CreateLocator( vp1, True )
               locx2.ypos = 40
               vp1.LabelFormat = none_format
```

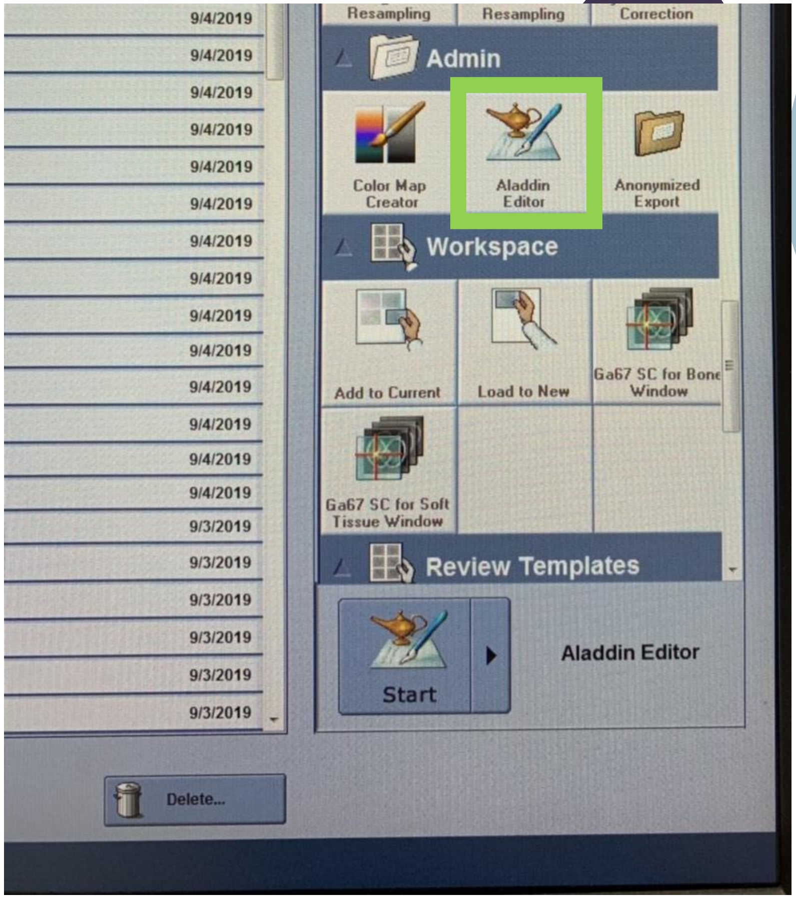


```
Sub Main

    REM The following code will display the first selected image on the first viewport
    REM on a 2 * 2 screen. You may erase the code and place you own.

    Dim i As Integer, Status as Boolean

    Load ImageItems(0)
    Set BasicScreen = CreateScreen("basic2.rt",True)
    Display BasicScreen
    Status = SelectTools( TRUE,CINE_TOOL,ANNOT_TOOL, STATS_TOOL,COLORMAP_TOOL,ROI_TOOL,PANZOOM_TOOL,SCROLL_TOOL)

    For i= 0 to 3
        set Viewports(i) = GetViewport("cell" + cstr(i+1))
    next

    Display ImageItems(0), Viewports(0), CInt(ImageItems(0).length/2 + 0.5)

End Sub

Function  DataValidate(dv_Message       As String,_
                       sel_image_list() As Image,_
                   numImages        As Integer,_
                   sel_curve_list() As Curve,_
                   numCurves        As Integer) As Integer
```

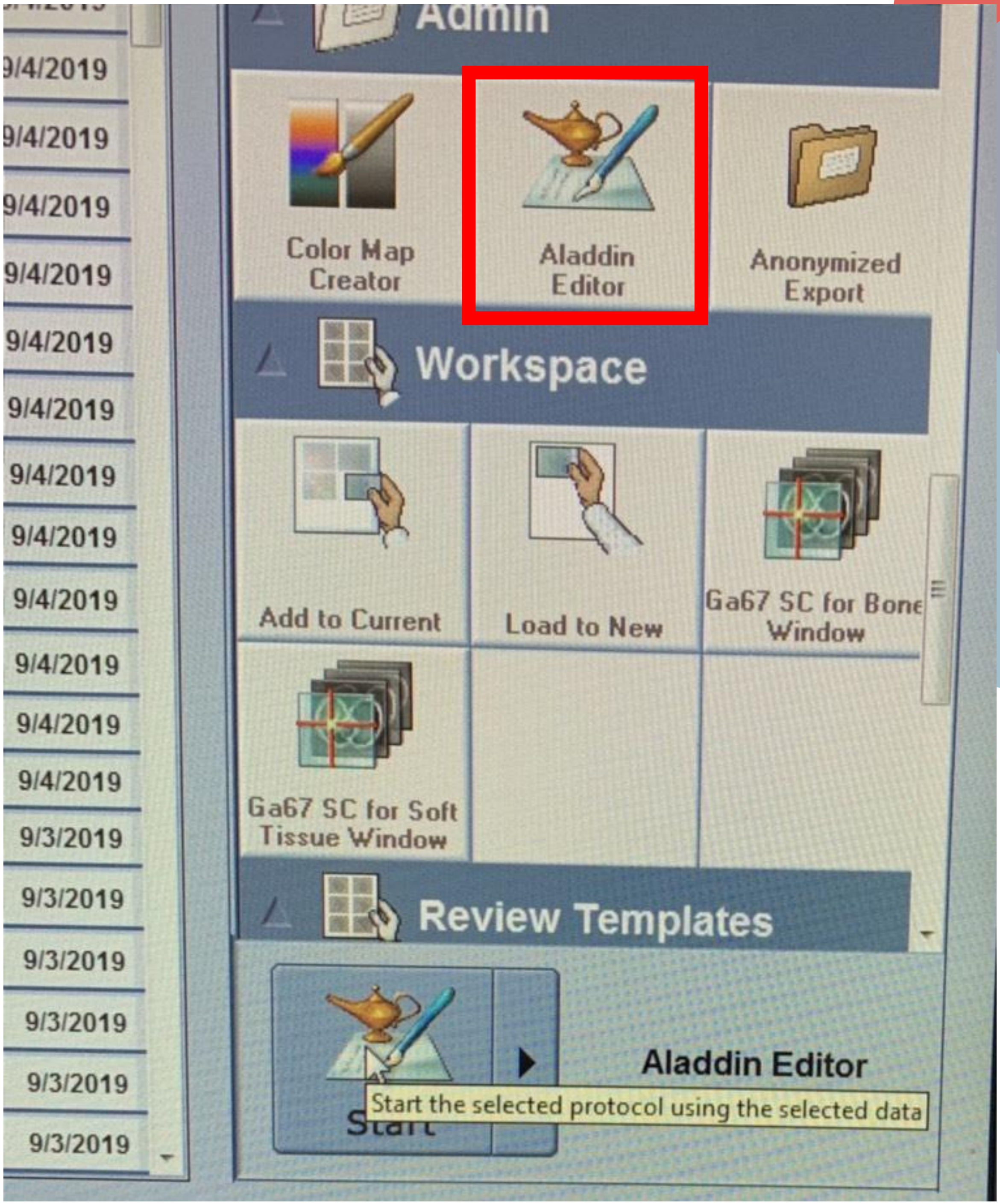
操作流程畫面

Introduction	Code	Aladdin interface	Procedures	Doing
A	B	Γ	Δ	E
			操作 流程畫面	

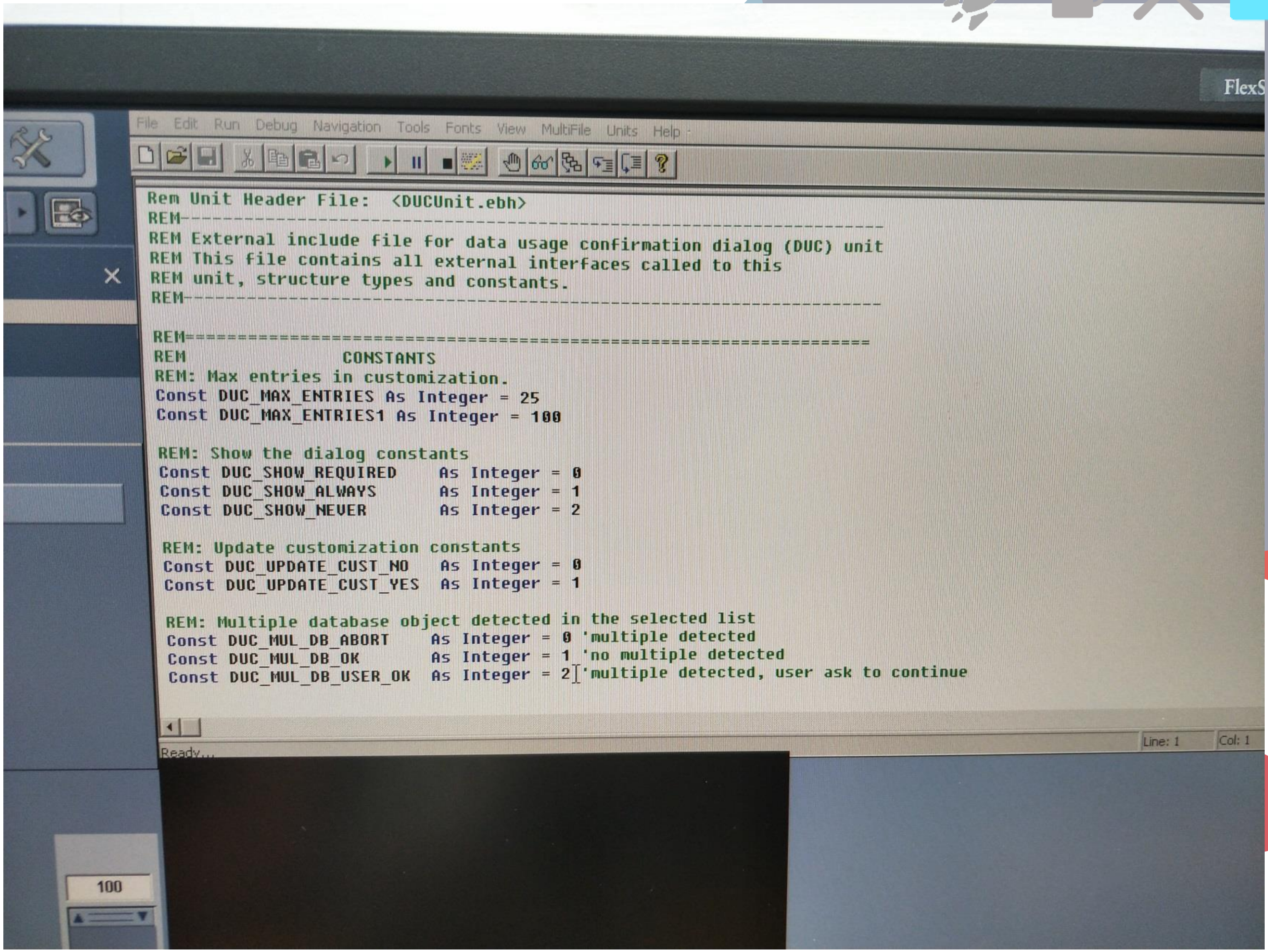
執行阿拉丁程式


9/4/2019
9/4/2019
9/4/2019
9/4/2019
9/4/2019
9/4/2019
9/4/2019
9/4/2019
9/4/2019
9/4/2019
9/4/2019
9/4/2019
9/4/2019
9/4/2019
9/3/2019
9/3/2019
9/3/2019
9/3/2019
9/3/2019
9/3/2019
Resampling
Resampling
Correction
Admin
Color Map Creator
Aladdin Editor
Anonymized Export
Workspace
Add to Current
Load to New
Ga67 SC for Bone Window
Ga67 SC for Soft Tissue Window
Review Templates
Start
Aladdin Editor
Delete...

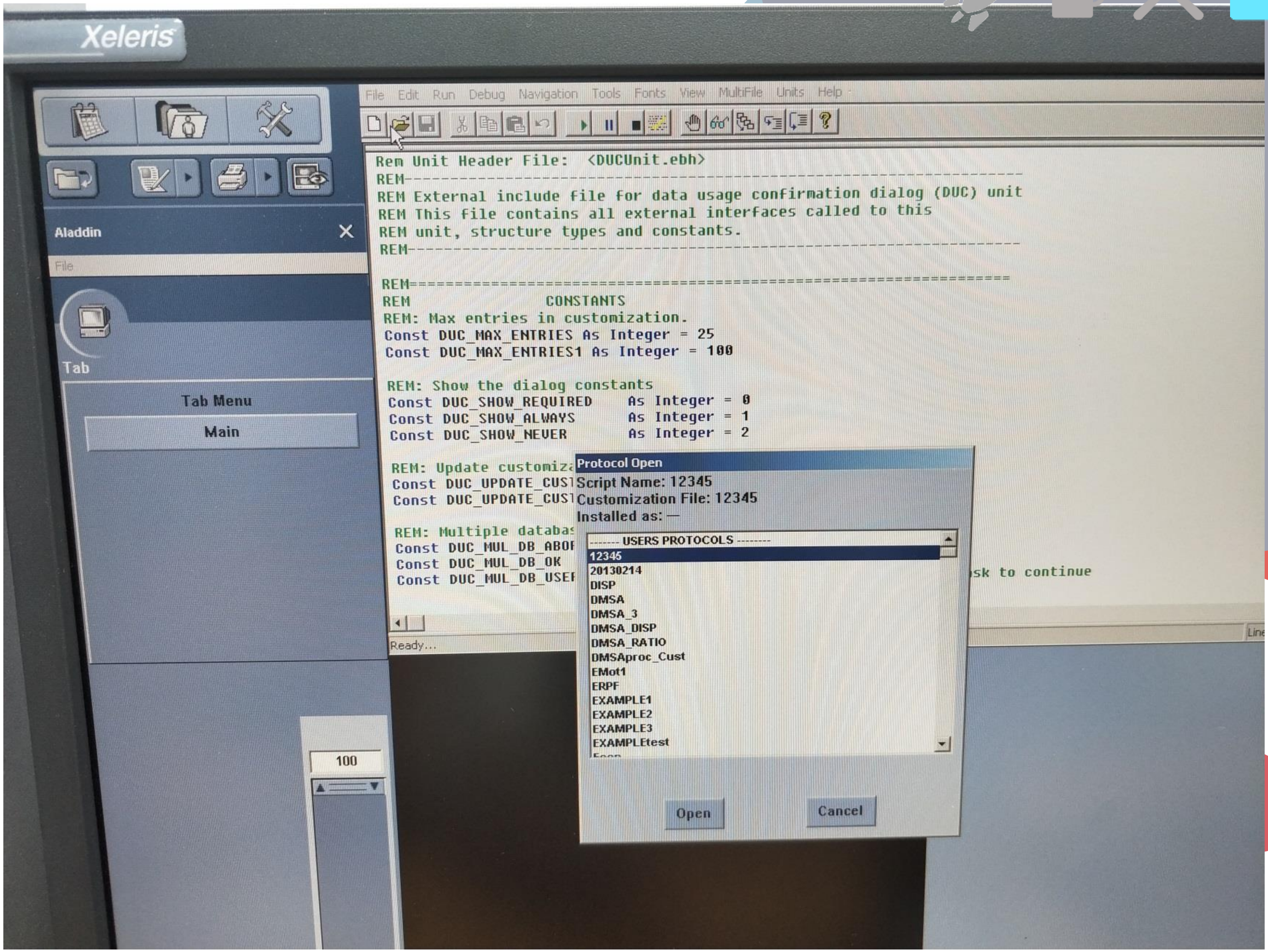

Aladdin Editor



Start the selected protocol using the selected data



```
Rem Unit Header File:  <DUCUnit.ebh>
REM-----------------------------------------------------------------------
REM External include file for data usage confirmation dialog (DUC) unit
REM This file contains all external interfaces called to this
REM unit, structure types and constants.
REM-----------------------------------------------------------------------

REM=====================================================================
REM                CONSTANTS
REM: Max entries in customization.
Const DUC_MAX_ENTRIES As Integer = 25
Const DUC_MAX_ENTRIES1 As Integer = 100

REM: Show the dialog constants
Const DUC_SHOW_REQUIRED     As Integer = 0
Const DUC_SHOW_ALWAYS       As Integer = 1
Const DUC_SHOW_NEVER        As Integer = 2

REM: Update customization constants
Const DUC_UPDATE_CUST_NO    As Integer = 0
Const DUC_UPDATE_CUST_YES   As Integer = 1

REM: Multiple database object detected in the selected list
Const DUC_MUL_DB_ABORT     As Integer = 0 'multiple detected
Const DUC_MUL_DB_OK        As Integer = 1 'no multiple detected
Const DUC_MUL_DB_USER_OK   As Integer = 2'multiple detected, user ask to continue
```



```
Rem Unit Header File:  <DUCUnit.ebh>
REM-----------------------------------------------------------------------
REM External include file for data usage confirmation dialog (DUC) unit
REM This file contains all external interfaces called to this
REM unit, structure types and constants.
REM-----------------------------------------------------------------------

REM=======================================================================
REM                 CONSTANTS
REM: Max entries in customization.
Const DUC_MAX_ENTRIES As Integer = 25
Const DUC_MAX_ENTRIES1 As Integer = 100

REM: Show the dialog constants
Const DUC_SHOW_REQUIRED    As Integer = 0
Const DUC_SHOW_ALWAYS      As Integer = 1
Const DUC_SHOW_NEVER       As Integer = 2

REM: Update customiz
Const DUC_UPDATE_CUS
Const DUC_UPDATE_CUS

REM: Multiple databas
Const DUC_MUL_DB_ABOI
Const DUC_MUL_DB_OK
Const DUC_MUL_DB_USEI                                          sk to continue
Ready...
```

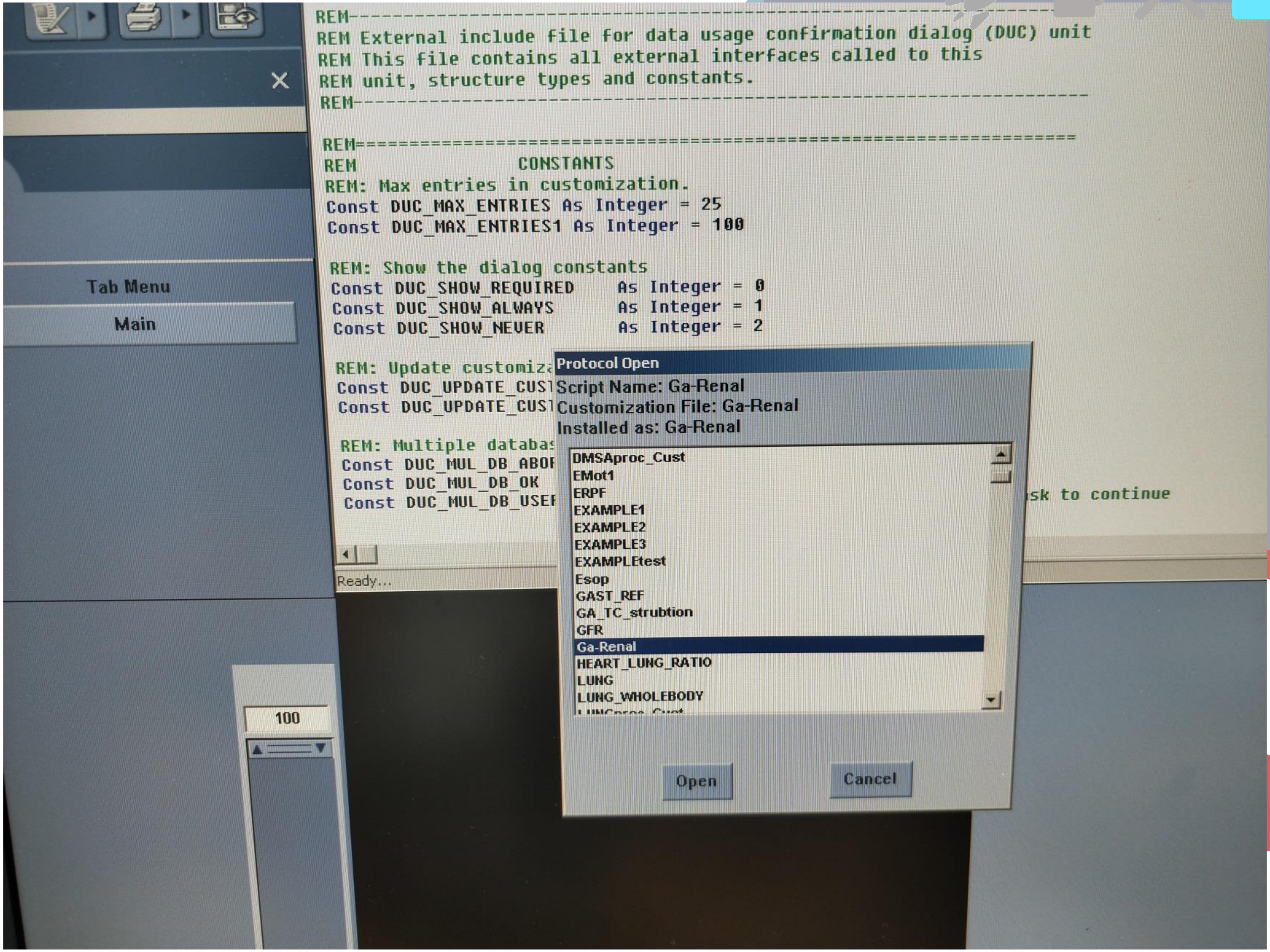
Protocol Open

Script Name: 12345

Customization File: 12345

Installed as: —

------- USERS PROTOCOLS --------
- 12345
- 20130214
- DISP
- DMSA
- DMSA_3
- DMSA_DISP
- DMSA_RATIO
- DMSAproc_Cust
- EMot1
- ERPF
- EXAMPLE1
- EXAMPLE2
- EXAMPLE3
- EXAMPLEtest



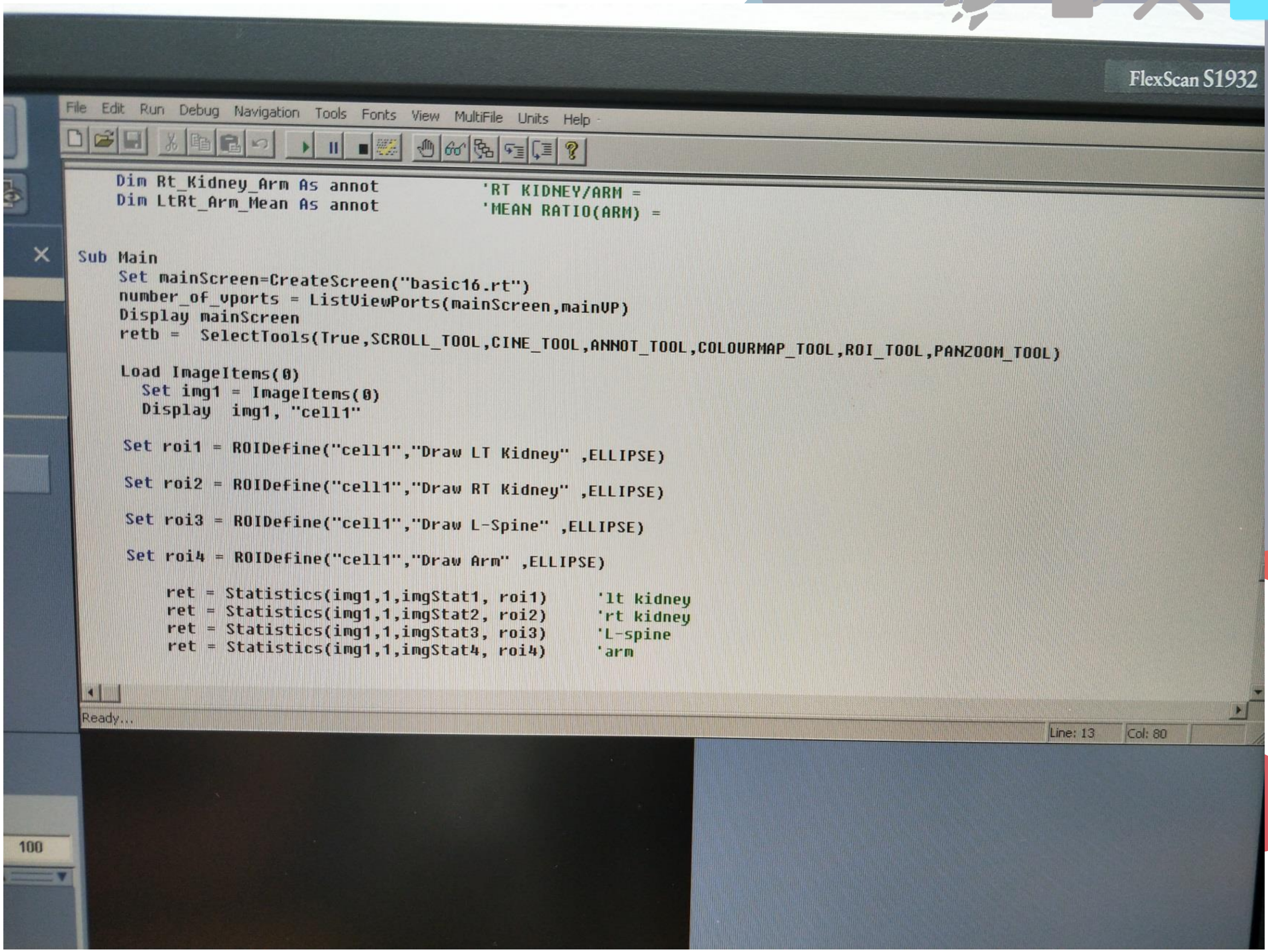
```
REM------------------------------------------------------------------------
REM External include file for data usage confirmation dialog (DUC) unit
REM This file contains all external interfaces called to this
REM unit, structure types and constants.
REM------------------------------------------------------------------------

REM====================================================================
REM                CONSTANTS
REM: Max entries in customization.
Const DUC_MAX_ENTRIES As Integer = 25
Const DUC_MAX_ENTRIES1 As Integer = 100

REM: Show the dialog constants
Const DUC_SHOW_REQUIRED     As Integer = 0
Const DUC_SHOW_ALWAYS       As Integer = 1
Const DUC_SHOW_NEVER        As Integer = 2

REM: Update customiza
Const DUC_UPDATE_CUS
Const DUC_UPDATE_CUS

REM: Multiple databas
Const DUC_MUL_DB_ABOR
Const DUC_MUL_DB_OK
Const DUC_MUL_DB_USER
                                                   sk to continue
```

Ready...

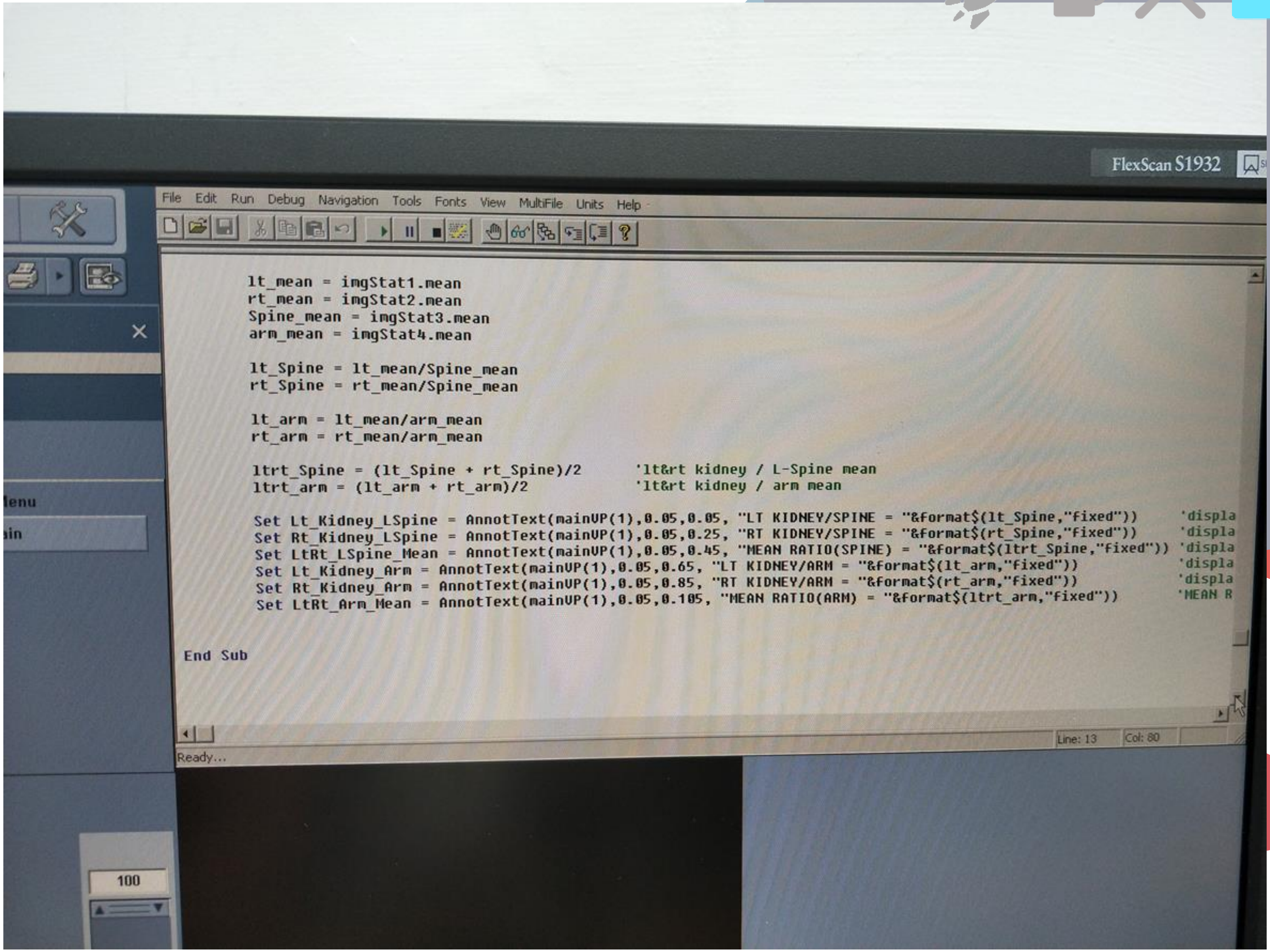
Protocol Open

Script Name: Ga-Renal
Customization File: Ga-Renal
Installed as: Ga-Renal

- DMSAproc_Cust
- EMot1
- ERPF
- EXAMPLE1
- EXAMPLE2
- EXAMPLE3
- EXAMPLEtest
- Esop
- GAST_REF
- GA_TC_strubtion
- GFR
- Ga-Renal
- HEART_LUNG_RATIO
- LUNG
- LUNG_WHOLEBODY



```
    Dim Rt_Kidney_Arm As annot              'RT KIDNEY/ARM =
    Dim LtRt_Arm_Mean As annot              'MEAN RATIO(ARM) =


Sub Main
    Set mainScreen=CreateScreen("basic16.rt")
    number_of_vports = ListViewPorts(mainScreen,mainVP)
    Display mainScreen
    retb =  SelectTools(True,SCROLL_TOOL,CINE_TOOL,ANNOT_TOOL,COLOURMAP_TOOL,ROI_TOOL,PANZOOM_TOOL)

    Load ImageItems(0)
      Set img1 = ImageItems(0)
      Display  img1, "cell1"

     Set roi1 = ROIDefine("cell1","Draw LT Kidney" ,ELLIPSE)

     Set roi2 = ROIDefine("cell1","Draw RT Kidney" ,ELLIPSE)

     Set roi3 = ROIDefine("cell1","Draw L-Spine" ,ELLIPSE)

     Set roi4 = ROIDefine("cell1","Draw Arm" ,ELLIPSE)

         ret = Statistics(img1,1,imgStat1, roi1)     'lt kidney
         ret = Statistics(img1,1,imgStat2, roi2)     'rt kidney
         ret = Statistics(img1,1,imgStat3, roi3)     'L-spine
         ret = Statistics(img1,1,imgStat4, roi4)     'arm
```



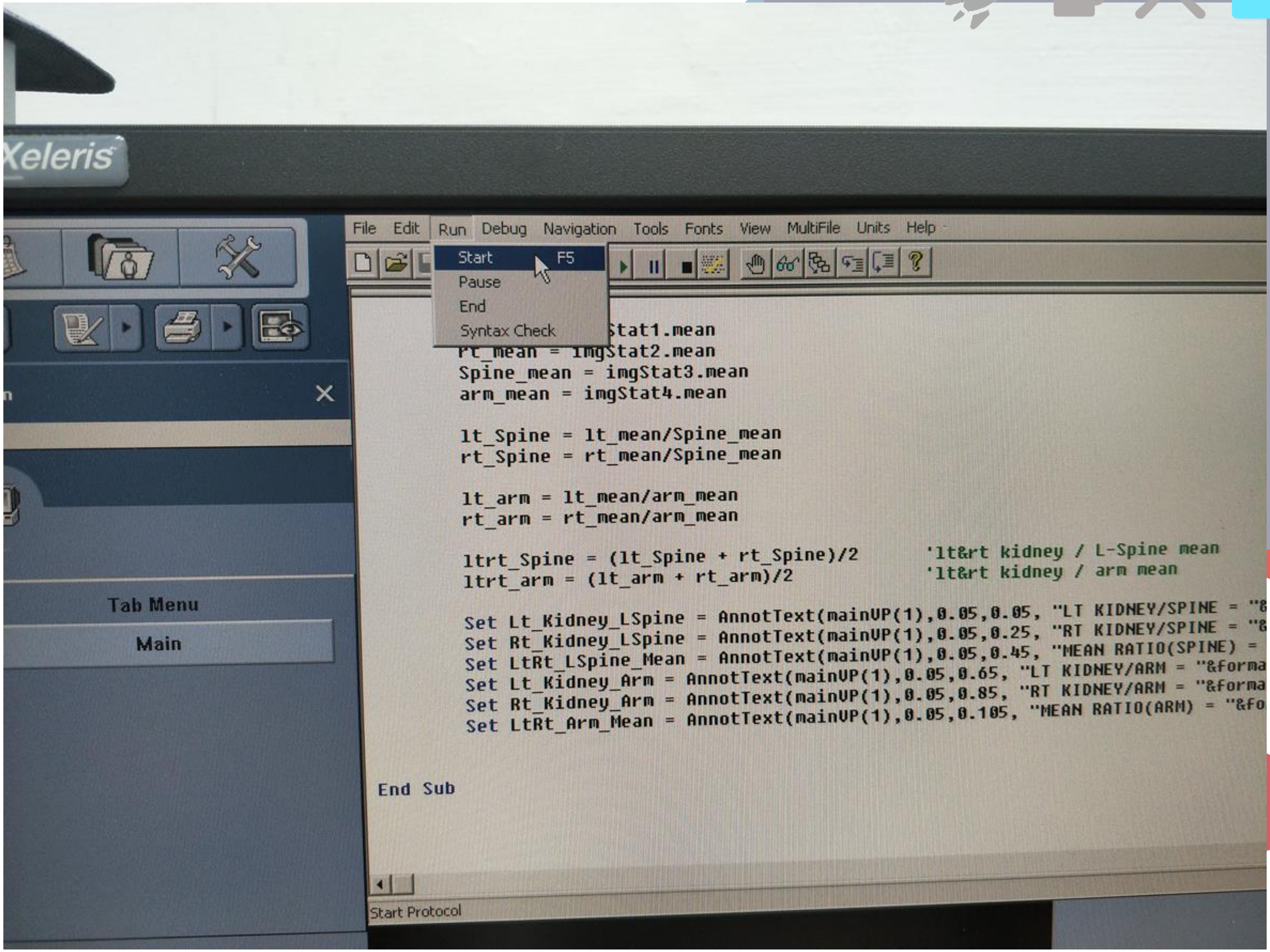
```
        lt_mean = imgStat1.mean
        rt_mean = imgStat2.mean
        Spine_mean = imgStat3.mean
        arm_mean = imgStat4.mean

        lt_Spine = lt_mean/Spine_mean
        rt_Spine = rt_mean/Spine_mean

        lt_arm = lt_mean/arm_mean
        rt_arm = rt_mean/arm_mean

        ltrt_Spine = (lt_Spine + rt_Spine)/2      'lt&rt kidney / L-Spine mean
        ltrt_arm = (lt_arm + rt_arm)/2            'lt&rt kidney / arm mean

        Set Lt_Kidney_LSpine = AnnotText(mainVP(1),0.05,0.05, "LT KIDNEY/SPINE = "&format$(lt_Spine,"fixed"))     'displa
        Set Rt_Kidney_LSpine = AnnotText(mainVP(1),0.05,0.25, "RT KIDNEY/SPINE = "&format$(rt_Spine,"fixed"))     'displa
        Set LtRt_LSpine_Mean = AnnotText(mainVP(1),0.05,0.45, "MEAN RATIO(SPINE) = "&format$(ltrt_Spine,"fixed")) 'displa
        Set Lt_Kidney_Arm = AnnotText(mainVP(1),0.05,0.65, "LT KIDNEY/ARM = "&format$(lt_arm,"fixed"))            'displa
        Set Rt_Kidney_Arm = AnnotText(mainVP(1),0.05,0.85, "RT KIDNEY/ARM = "&format$(rt_arm,"fixed"))            'displa
        Set LtRt_Arm_Mean = AnnotText(mainVP(1),0.05,0.105, "MEAN RATIO(ARM) = "&format$(ltrt_arm,"fixed"))       'MEAN R


End Sub
```

```
Sub Main

Set mainScreen = createscreen(“basic16.rt”)

Number_of vports = listviewports(mainscreen,mainvp)

Display mainscreen

retb = selectools(true,scroll_tool,cine_tool,annot_tool,colourmap_tool,panzoom_tool)


load imageitem(0)

display img1,”cell1”
```

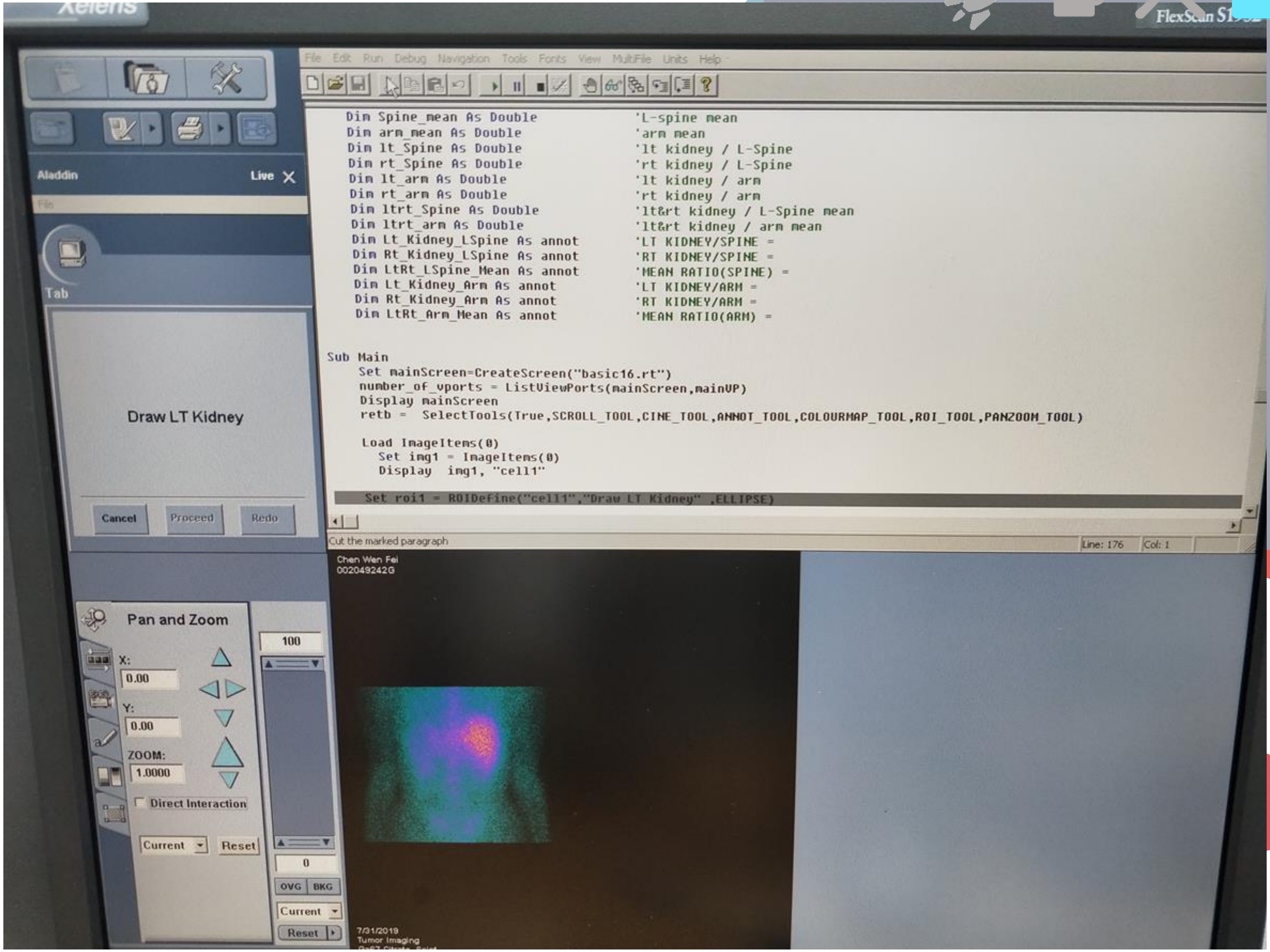
```
set roi1 = roidefine(“cell1”,”draw LT kidney” , ellipse)

set rio2 = roidefine(“cell1”,”draw RT kidney”, ellipse)

set rio3 = roidefine(“cell1”,”draw L-Spine”, ellipse)

set rio4 = roidefine(“cell1”,”draw Arm”, ellipse)


ret = statistics(Img1,1,imgStat1 , ROI1)  ‘lt kidney

ret = statistics(Img1,1,imgStat2 , ROI2)  ‘Rt kidney

ret = statistics(Img1,1,imgStat3 , ROI3)  ‘L-Spine

ret = statistics(Img1,1,imgStat4 , ROI4)  ‘arm
```

```
LT_mean = imgstat1.mean

Rt_mean = imgstat2.mean

Spine_mean = imgstat3.mean

Arm_mean = imgstat4.mean


LT_Spine = LT_mean/spine_mean

RT_Spine = RT_mean/Spine_mean


LT_arm = LT_mean/arm_mean

RT_arm = RT_mean/arm_mean

LTRT_Spine = (LT_Spine + RT_Spine)/2   ‘LT&RT kidney / L-Spine mean

LTRT_arm = (LT_arm + RT_arm)/2       ‘LT&RT kidney / arm mean
```

```
Set LT_kidney_Lspine = annotext(MainVP(1),0.05,0.05 , “LT kidney/Spine =
“&format$(LT_Spine,”fixed”))

‘display LT KIDNEY/SPINE =

Set RT_kidney_Lspine = annotext(MainVP(1),0.05,0.25 , “RT kidney/Spine
= ”&format$(RT_Spine,”fixed”))

‘display RT KIDNEY/SPINE =

Set LTRT_Lspine_mean = annotext(MainVP(1),0.05,0.45 , “mean ratio(spine)
= ”&format$(LTRT_Spine,”fixed”))

‘display MEAN Ratio (SPINE) =

Set LT_kidney_ arm = annotext(MainVP(1),0.05,0.65 , “LT kidney/arm
=  ”&format$(LT_arm,”fixed”))

‘display LT KIDNEY/ARM =

Set LT_kidney_arm = annotext(MainVP(1),0.05,0.85 , “LT kidney/ arm
= ”&format$(RT_arm,”fixed”))

‘display RT KIDNEY/ARM =

Set LT_ arm_mean = annotext(MainVP(1),0.05,0.105 1.05, “mean ratio(arm)
= ”&format$(LTRT_arm,”fixed”))

‘MEAN RATIO/ARM =
```



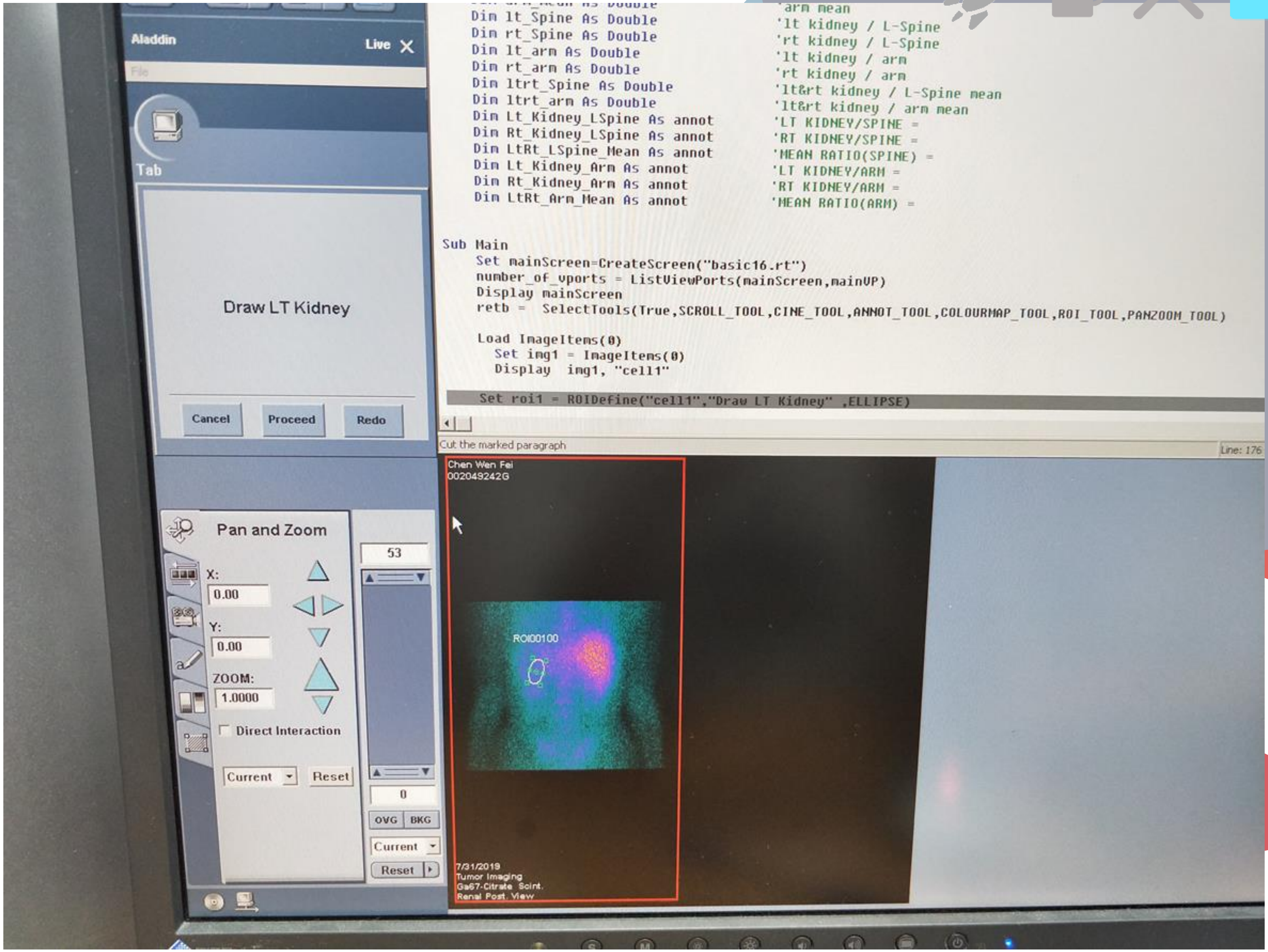
```
                  Stat1.mean
    rt_mean = imgStat2.mean
    Spine_mean = imgStat3.mean
    arm_mean = imgStat4.mean

    lt_Spine = lt_mean/Spine_mean
    rt_Spine = rt_mean/Spine_mean

    lt_arm = lt_mean/arm_mean
    rt_arm = rt_mean/arm_mean

    ltrt_Spine = (lt_Spine + rt_Spine)/2       'lt&rt kidney / L-Spine mean
    ltrt_arm = (lt_arm + rt_arm)/2             'lt&rt kidney / arm mean

    Set Lt_Kidney_LSpine = AnnotText(mainVP(1),0.05,0.05, "LT KIDNEY/SPINE = "&
    Set Rt_Kidney_LSpine = AnnotText(mainVP(1),0.05,0.25, "RT KIDNEY/SPINE = "&
    Set LtRt_LSpine_Mean = AnnotText(mainVP(1),0.05,0.45, "MEAN RATIO(SPINE) =
    Set Lt_Kidney_Arm = AnnotText(mainVP(1),0.05,0.65, "LT KIDNEY/ARM = "&forma
    Set Rt_Kidney_Arm = AnnotText(mainVP(1),0.05,0.85, "RT KIDNEY/ARM = "&forma
    Set LtRt_Arm_Mean = AnnotText(mainVP(1),0.05,0.105, "MEAN RATIO(ARM) = "&fo


End Sub
```



X: 0.00
Y: 0.00
ZOOM: 1.0000

```
    Dim Spine_mean As Double              'L-spine mean
    Dim arm_mean As Double                'arm mean
    Dim lt_Spine As Double                'lt kidney / L-Spine
    Dim rt_Spine As Double                'rt kidney / L-Spine
    Dim lt_arm As Double                  'lt kidney / arm
    Dim rt_arm As Double                  'rt kidney / arm
    Dim ltrt_Spine As Double              'lt&rt kidney / L-Spine mean
    Dim ltrt_arm As Double                'lt&rt kidney / arm mean
    Dim Lt_Kidney_LSpine As annot         'LT KIDNEY/SPINE =
    Dim Rt_Kidney_LSpine As annot         'RT KIDNEY/SPINE =
    Dim LtRt_LSpine_Mean As annot         'MEAN RATIO(SPINE) =
    Dim Lt_Kidney_Arm As annot            'LT KIDNEY/ARM =
    Dim Rt_Kidney_Arm As annot            'RT KIDNEY/ARM =
    Dim LtRt_Arm_Mean As annot            'MEAN RATIO(ARM) =


Sub Main
    Set mainScreen=CreateScreen("basic16.rt")
    number_of_vports = ListViewPorts(mainScreen,mainVP)
    Display mainScreen
    retb =  SelectTools(True,SCROLL_TOOL,CINE_TOOL,ANNOT_TOOL,COLOURMAP_TOOL,ROI_TOOL,PANZOOM_TOOL)

    Load ImageItems(0)
      Set img1 = ImageItems(0)
      Display  img1, "cell1"

    Set roi1 = ROIDefine("cell1","Draw LT Kidney" ,ELLIPSE)
```

Cut the marked paragraph
Line: 176 Col: 1

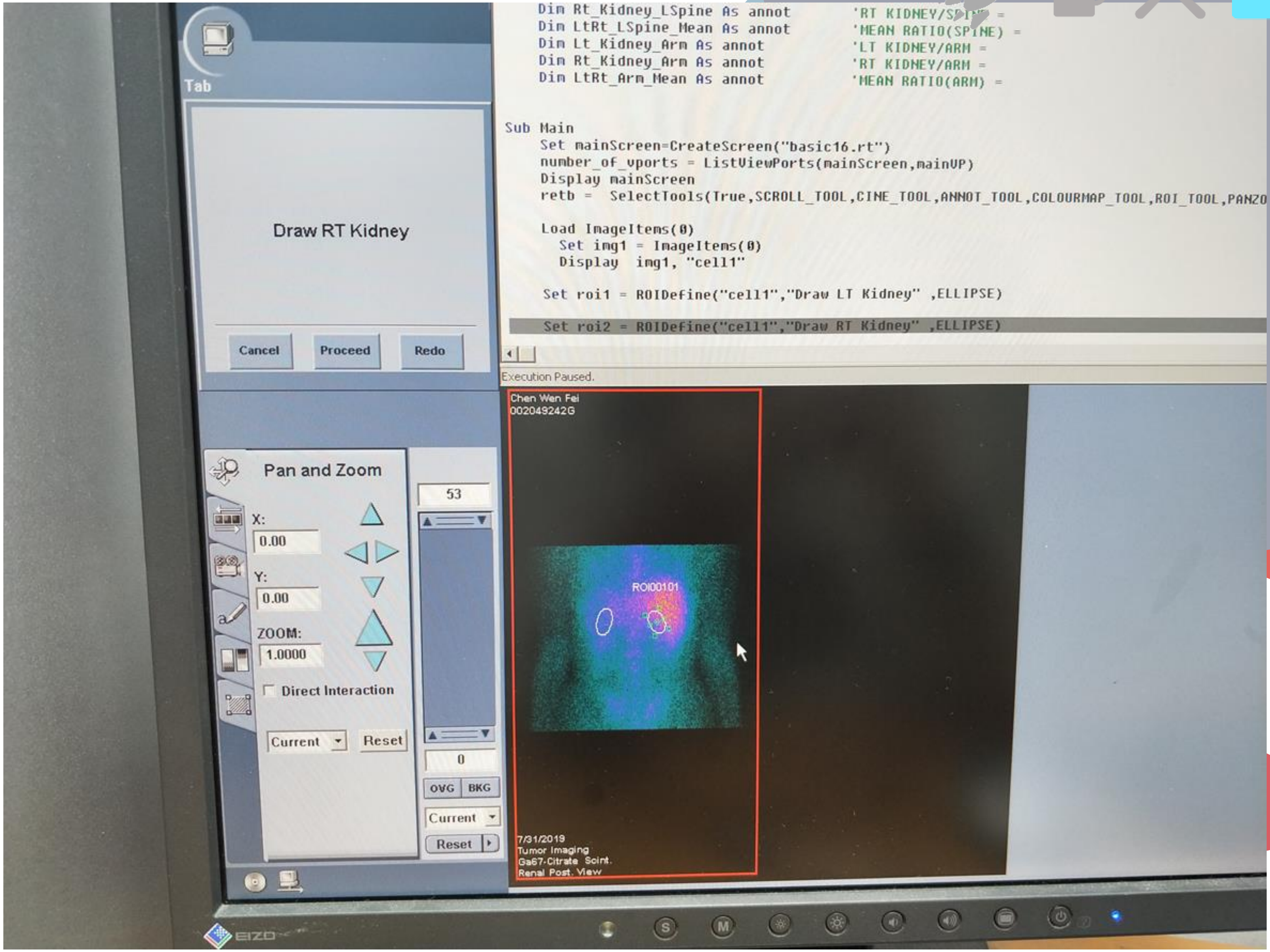


```
                                        'arm mean
    Dim lt_Spine As Double              'lt kidney / L-Spine
    Dim rt_Spine As Double              'rt kidney / L-Spine
    Dim lt_arm As Double                'lt kidney / arm
    Dim rt_arm As Double                'rt kidney / arm
    Dim ltrt_Spine As Double            'lt&rt kidney / L-Spine mean
    Dim ltrt_arm As Double              'lt&rt kidney / arm mean
    Dim Lt_Kidney_LSpine As annot       'LT KIDNEY/SPINE =
    Dim Rt_Kidney_LSpine As annot       'RT KIDNEY/SPINE =
    Dim LtRt_LSpine_Mean As annot       'MEAN RATIO(SPINE) =
    Dim Lt_Kidney_Arm As annot          'LT KIDNEY/ARM =
    Dim Rt_Kidney_Arm As annot          'RT KIDNEY/ARM =
    Dim LtRt_Arm_Mean As annot          'MEAN RATIO(ARM) =


Sub Main
    Set mainScreen=CreateScreen("basic16.rt")
    number_of_vports = ListViewPorts(mainScreen,mainVP)
    Display mainScreen
    retb =  SelectTools(True,SCROLL_TOOL,CINE_TOOL,ANNOT_TOOL,COLOURMAP_TOOL,ROI_TOOL,PANZOOM_TOOL)

    Load ImageItems(0)
      Set img1 = ImageItems(0)
      Display  img1, "cell1"

    Set roi1 = ROIDefine("cell1","Draw LT Kidney" ,ELLIPSE)
```

Cut the marked paragraph

Line: 176

Draw LT Kidney



```
    Dim Rt_Kidney_LSpine As annot          'RT KIDNEY/SPI  =
    Dim LtRt_LSpine_Mean As annot          'MEAN RATIO(SPINE) =
    Dim Lt_Kidney_Arm As annot             'LT KIDNEY/ARM =
    Dim Rt_Kidney_Arm As annot             'RT KIDNEY/ARM =
    Dim LtRt_Arm_Mean As annot             'MEAN RATIO(ARM) =


Sub Main
    Set mainScreen=CreateScreen("basic16.rt")
    number_of_vports = ListViewPorts(mainScreen,mainVP)
    Display mainScreen
    retb =  SelectTools(True,SCROLL_TOOL,CINE_TOOL,ANNOT_TOOL,COLOURMAP_TOOL,ROI_TOOL,PANZO

    Load ImageItems(0)
      Set img1 = ImageItems(0)
      Display  img1, "cell1"

    Set roi1 = ROIDefine("cell1","Draw LT Kidney" ,ELLIPSE)

    Set roi2 = ROIDefine("cell1","Draw RT Kidney" ,ELLIPSE)
```

Execution Paused.

Draw RT Kidney

X: 0.00

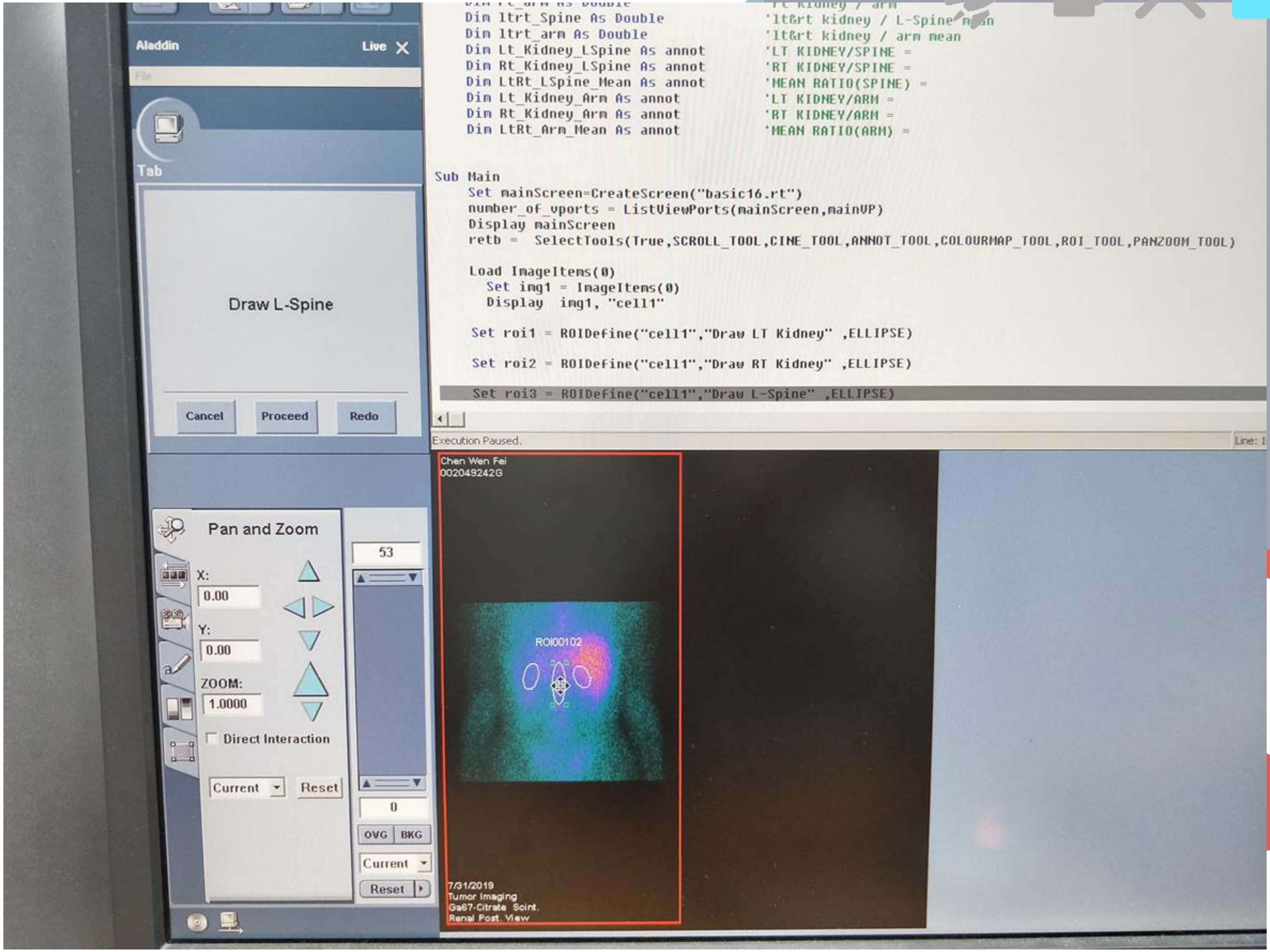
Y: 0.00

ZOOM: 1.0000

☐ Direct Interaction

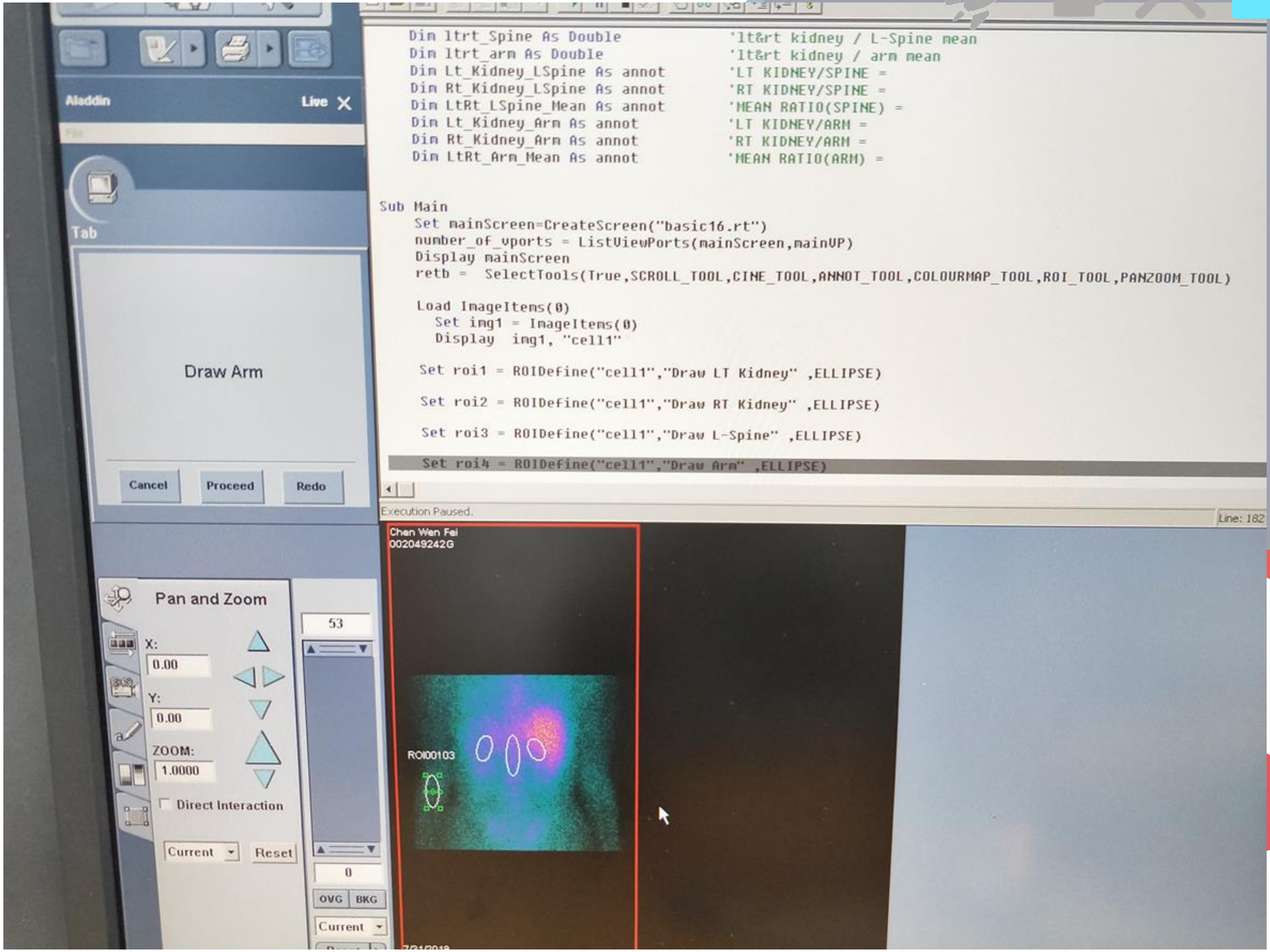
Chen Wen Fei
002049242G

7/31/2019
Tumor Imaging
Ga67-Citrate Scint.
Renal Post. View



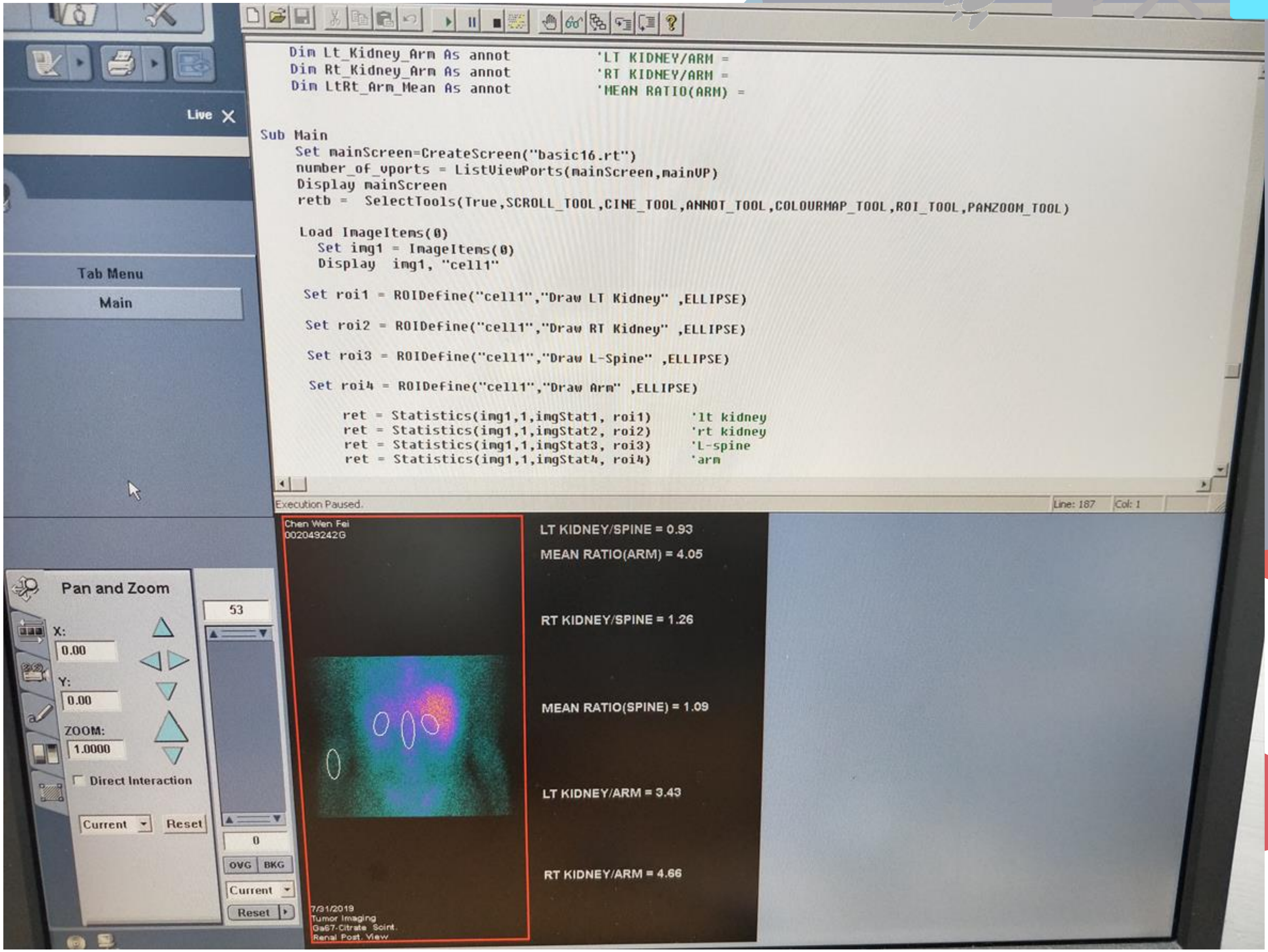
```
    Dim ltrt_Spine As Double            'lt&rt kidney / L-Spine mean
    Dim ltrt_arm As Double              'lt&rt kidney / arm mean
    Dim Lt_Kidney_LSpine As annot       'LT KIDNEY/SPINE =
    Dim Rt_Kidney_LSpine As annot       'RT KIDNEY/SPINE =
    Dim LtRt_LSpine_Mean As annot       'MEAN RATIO(SPINE) =
    Dim Lt_Kidney_Arm As annot          'LT KIDNEY/ARM =
    Dim Rt_Kidney_Arm As annot          'RT KIDNEY/ARM =
    Dim LtRt_Arm_Mean As annot          'MEAN RATIO(ARM) =


Sub Main
    Set mainScreen=CreateScreen("basic16.rt")
    number_of_vports = ListViewPorts(mainScreen,mainVP)
    Display mainScreen
    retb =  SelectTools(True,SCROLL_TOOL,CINE_TOOL,ANNOT_TOOL,COLOURMAP_TOOL,ROI_TOOL,PANZOOM_TOOL)

    Load ImageItems(0)
      Set img1 = ImageItems(0)
      Display  img1, "cell1"

    Set roi1 = ROIDefine("cell1","Draw LT Kidney" ,ELLIPSE)

    Set roi2 = ROIDefine("cell1","Draw RT Kidney" ,ELLIPSE)

    Set roi3 = ROIDefine("cell1","Draw L-Spine" ,ELLIPSE)
```

Execution Paused.



```
    Dim ltrt_Spine As Double                'lt&rt kidney / L-Spine mean
    Dim ltrt_arm As Double                  'lt&rt kidney / arm mean
    Dim Lt_Kidney_LSpine As annot           'LT KIDNEY/SPINE =
    Dim Rt_Kidney_LSpine As annot           'RT KIDNEY/SPINE =
    Dim LtRt_LSpine_Mean As annot           'MEAN RATIO(SPINE) =
    Dim Lt_Kidney_Arm As annot              'LT KIDNEY/ARM =
    Dim Rt_Kidney_Arm As annot              'RT KIDNEY/ARM =
    Dim LtRt_Arm_Mean As annot              'MEAN RATIO(ARM) =


Sub Main
    Set mainScreen=CreateScreen("basic16.rt")
    number_of_vports = ListViewPorts(mainScreen,mainVP)
    Display mainScreen
    retb =  SelectTools(True,SCROLL_TOOL,CINE_TOOL,ANNOT_TOOL,COLOURMAP_TOOL,ROI_TOOL,PANZOOM_TOOL)

    Load ImageItems(0)
      Set img1 = ImageItems(0)
      Display  img1, "cell1"

     Set roi1 = ROIDefine("cell1","Draw LT Kidney" ,ELLIPSE)

     Set roi2 = ROIDefine("cell1","Draw RT Kidney" ,ELLIPSE)

     Set roi3 = ROIDefine("cell1","Draw L-Spine" ,ELLIPSE)

     Set roi4 = ROIDefine("cell1","Draw Arm" ,ELLIPSE)
```

```
Execution Paused.                                              Line: 182
```



```
    Dim Lt_Kidney_Arm As annot              'LT KIDNEY/ARM =
    Dim Rt_Kidney_Arm As annot              'RT KIDNEY/ARM =
    Dim LtRt_Arm_Mean As annot              'MEAN RATIO(ARM) =


Sub Main
     Set mainScreen=CreateScreen("basic16.rt")
     number_of_vports = ListViewPorts(mainScreen,mainVP)
     Display mainScreen
     retb =  SelectTools(True,SCROLL_TOOL,CINE_TOOL,ANNOT_TOOL,COLOURMAP_TOOL,ROI_TOOL,PANZOOM_TOOL)

     Load ImageItems(0)
       Set img1 = ImageItems(0)
       Display  img1, "cell1"

     Set roi1 = ROIDefine("cell1","Draw LT Kidney" ,ELLIPSE)

     Set roi2 = ROIDefine("cell1","Draw RT Kidney" ,ELLIPSE)

     Set roi3 = ROIDefine("cell1","Draw L-Spine" ,ELLIPSE)

     Set roi4 = ROIDefine("cell1","Draw Arm" ,ELLIPSE)

          ret = Statistics(img1,1,imgStat1, roi1)     'lt kidney
          ret = Statistics(img1,1,imgStat2, roi2)     'rt kidney
          ret = Statistics(img1,1,imgStat3, roi3)     'L-spine
          ret = Statistics(img1,1,imgStat4, roi4)     'arm
```

Execution Paused.

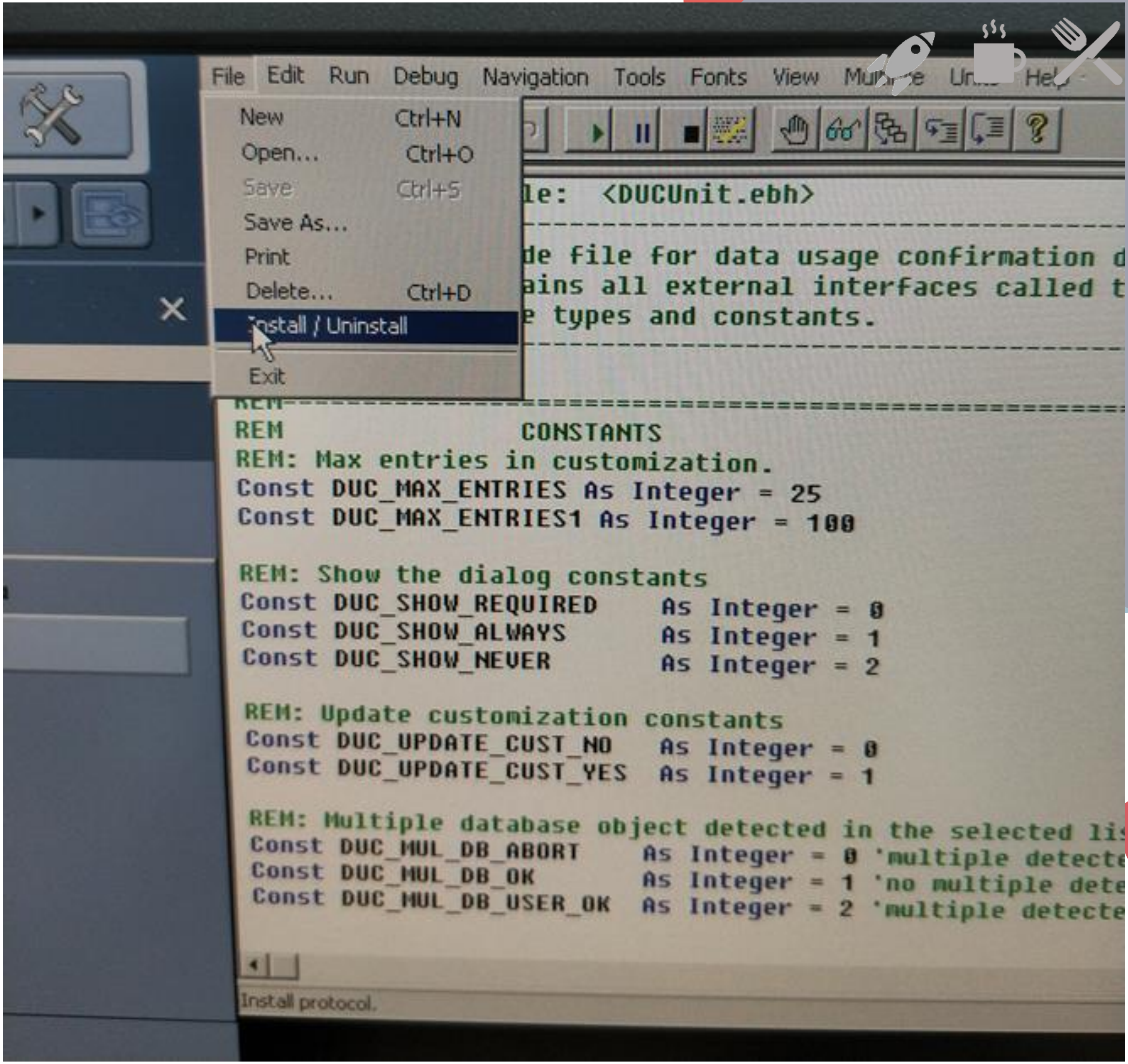
Line: 187 Col: 1

X: 0.00

Y: 0.00

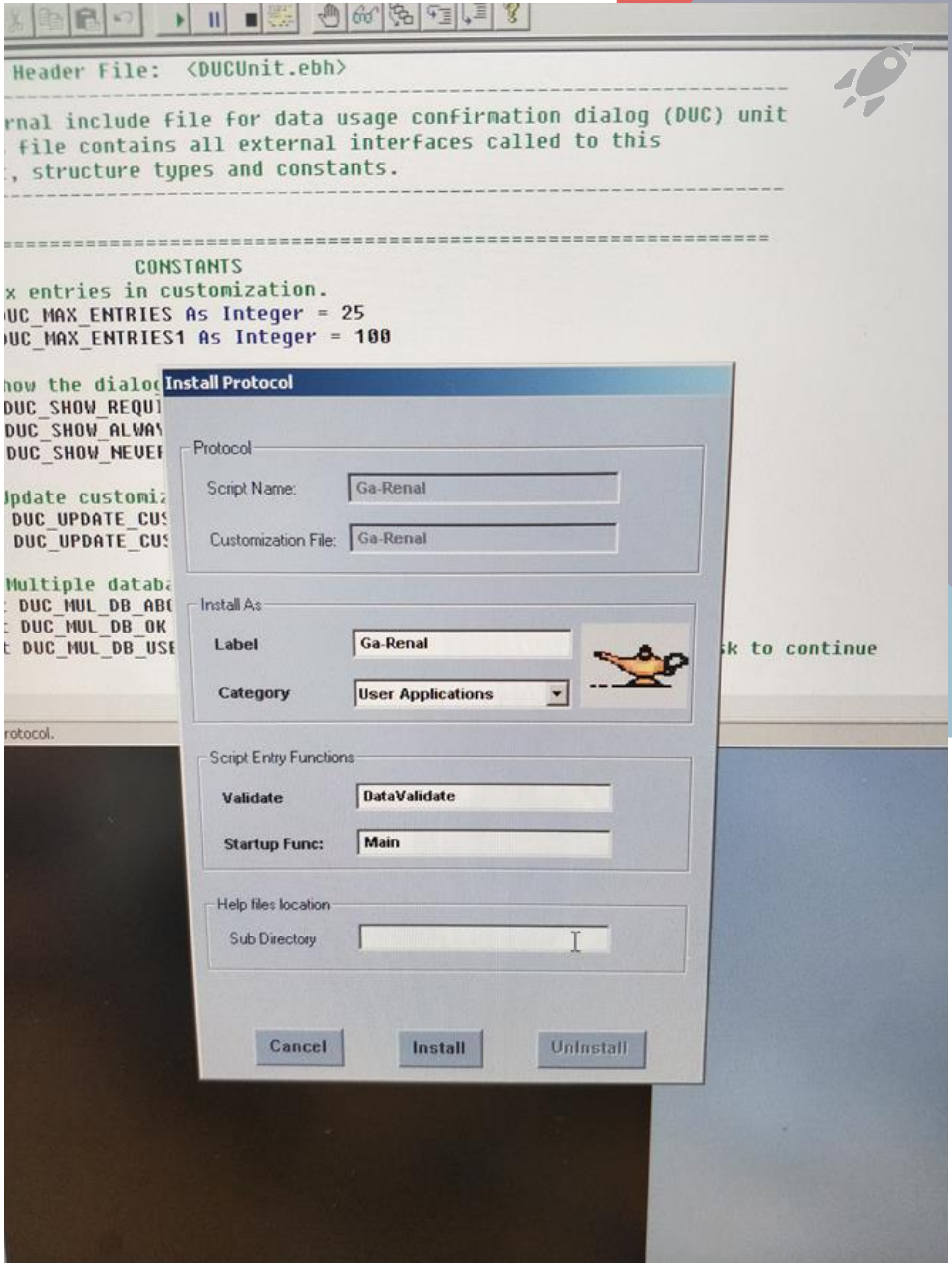
ZOOM: 1.0000

```
LT KIDNEY/SPINE = 0.93
MEAN RATIO(ARM) = 4.05

RT KIDNEY/SPINE = 1.26

MEAN RATIO(SPINE) = 1.09

LT KIDNEY/ARM = 3.43

RT KIDNEY/ARM = 4.66
```



```
le:  <DUCUnit.ebh>
---------------------------------------
de file for data usage confirmation d
ains all external interfaces called t
e types and constants.
---------------------------------------
REM=============================================
REM              CONSTANTS
REM: Max entries in customization.
Const DUC_MAX_ENTRIES As Integer = 25
Const DUC_MAX_ENTRIES1 As Integer = 100

REM: Show the dialog constants
Const DUC_SHOW_REQUIRED     As Integer = 0
Const DUC_SHOW_ALWAYS       As Integer = 1
Const DUC_SHOW_NEVER        As Integer = 2

REM: Update customization constants
Const DUC_UPDATE_CUST_NO    As Integer = 0
Const DUC_UPDATE_CUST_YES   As Integer = 1

REM: Multiple database object detected in the selected li
Const DUC_MUL_DB_ABORT     As Integer = 0 'multiple detecte
Const DUC_MUL_DB_OK        As Integer = 1 'no multiple dete
Const DUC_MUL_DB_USER_OK   As Integer = 2 'multiple detecte
```

Install protocol.



```
Header File:  <DUCUnit.ebh>
---------------------------------------------------------------------------
rnal include file for data usage confirmation dialog (DUC) unit
 file contains all external interfaces called to this
:, structure types and constants.
---------------------------------------------------------------------------

===========================================================================
            CONSTANTS
x entries in customization.
UC_MAX_ENTRIES As Integer = 25
UC_MAX_ENTRIES1 As Integer = 100

how the dialo
DUC_SHOW_REQUI
DUC_SHOW_ALWAY
DUC_SHOW_NEVEF

Jpdate customiz
 DUC_UPDATE_CUS
 DUC_UPDATE_CUS

Multiple databa
: DUC_MUL_DB_ABC
: DUC_MUL_DB_OK
t DUC_MUL_DB_USE
                                                    k to continue
rotocol.
```

Install Protocol

Protocol

Script Name: Ga-Renal

Customization File: Ga-Renal

Install As

Label Ga-Renal

Category User Applications

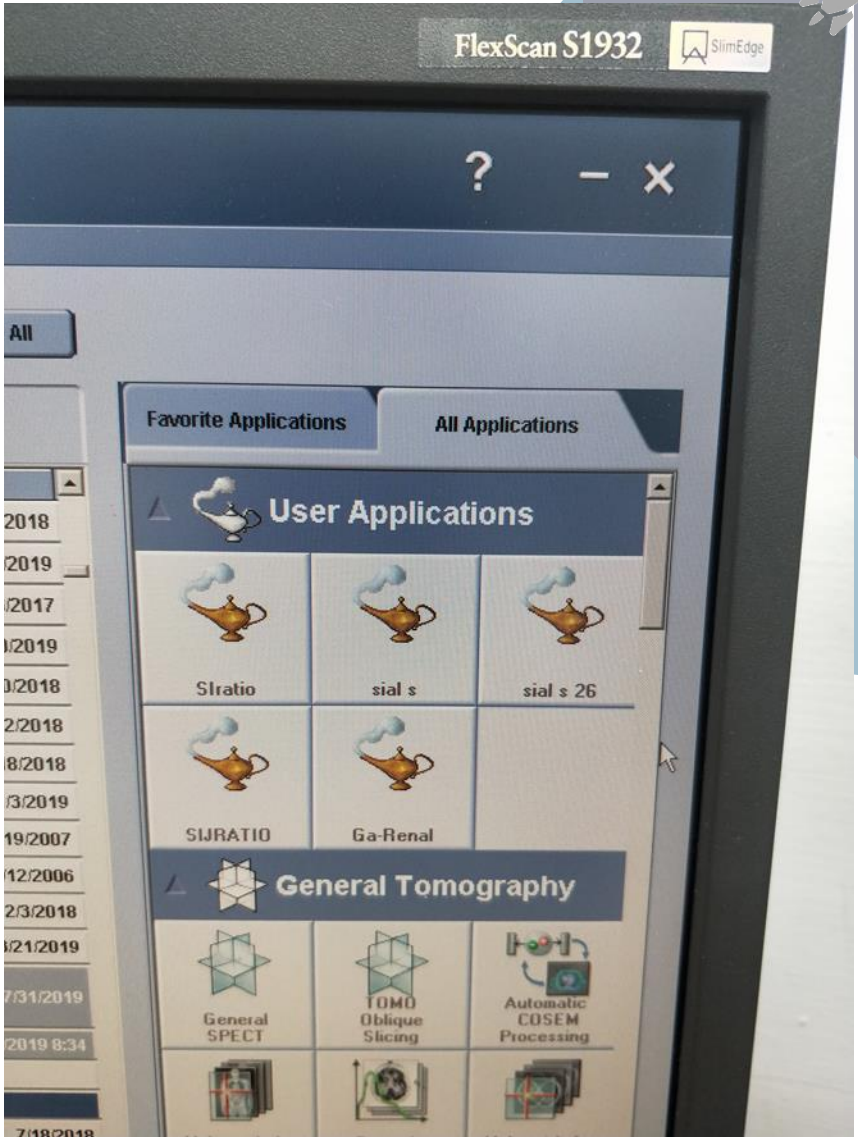
Script Entry Functions

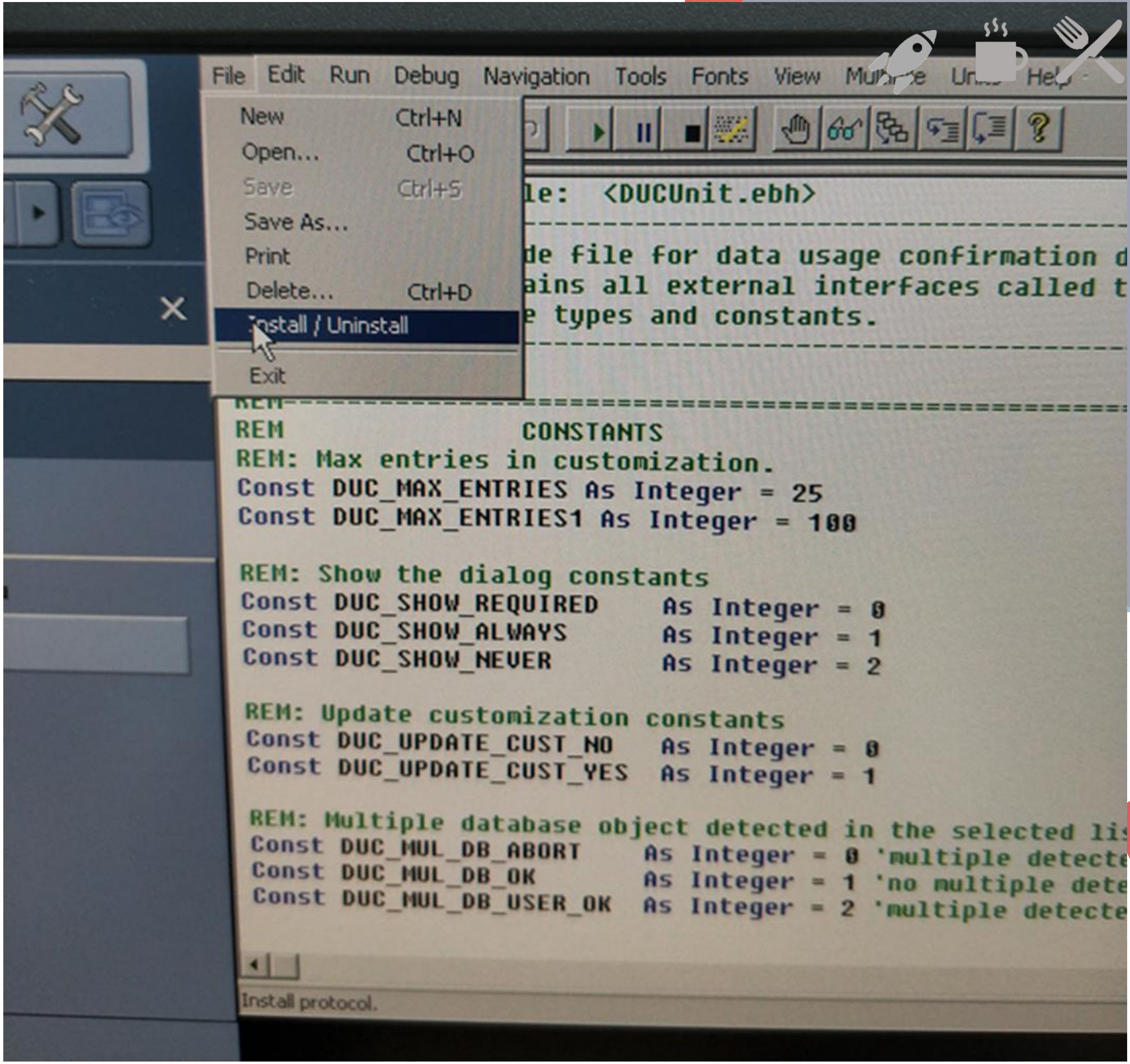
Validate DataValidate

Startup Func: Main

Help files location

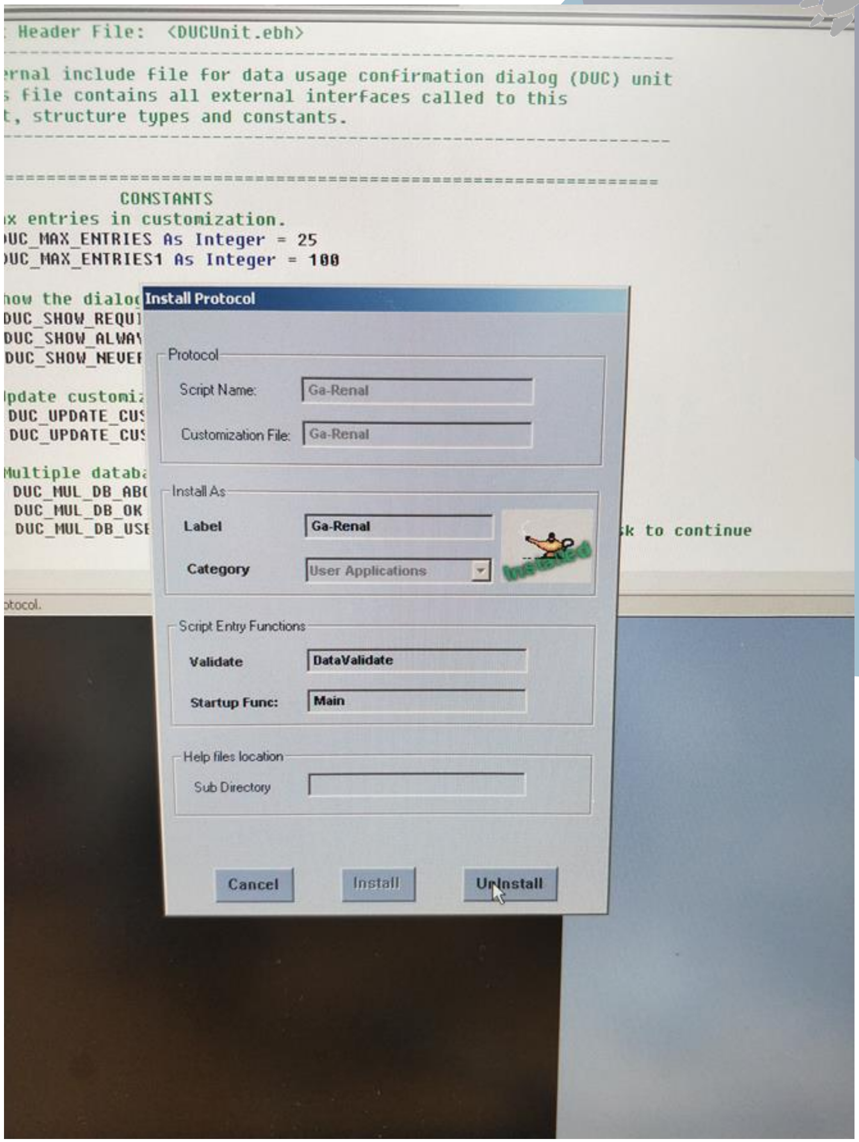
Sub Directory


FlexScan S1932
SlimEdge
All
Favorite Applications
All Applications
User Applications
SIratio
sial s
sial s 26
SIJRATIO
Ga-Renal
General Tomography
General SPECT
TOMO Oblique Slicing
Automatic COSEM Processing



```
le:  <DUCUnit.ebh>
---------------------------------------
de file for data usage confirmation d
ains all external interfaces called t
e types and constants.
---------------------------------------
REM=============================================
REM                    CONSTANTS
REM: Max entries in customization.
Const DUC_MAX_ENTRIES As Integer = 25
Const DUC_MAX_ENTRIES1 As Integer = 100

REM: Show the dialog constants
Const DUC_SHOW_REQUIRED      As Integer = 0
Const DUC_SHOW_ALWAYS        As Integer = 1
Const DUC_SHOW_NEVER         As Integer = 2

REM: Update customization constants
Const DUC_UPDATE_CUST_NO     As Integer = 0
Const DUC_UPDATE_CUST_YES    As Integer = 1

REM: Multiple database object detected in the selected lis
Const DUC_MUL_DB_ABORT     As Integer = 0 'multiple detecte
Const DUC_MUL_DB_OK        As Integer = 1 'no multiple dete
Const DUC_MUL_DB_USER_OK   As Integer = 2 'multiple detecte
```

Install protocol.



```
 Header File:  <DUCUnit.ebh>
----------------------------------------------------------------
rnal include file for data usage confirmation dialog (DUC) unit
 file contains all external interfaces called to this
t, structure types and constants.
----------------------------------------------------------------

================================================================
           CONSTANTS
x entries in customization.
UC_MAX_ENTRIES As Integer = 25
UC_MAX_ENTRIES1 As Integer = 100

how the dialog
DUC_SHOW_REQUI
DUC_SHOW_ALWAY
DUC_SHOW_NEVER

pdate customiz
 DUC_UPDATE_CUS
 DUC_UPDATE_CUS

Multiple databa
 DUC_MUL_DB_ABO
 DUC_MUL_DB_OK
 DUC_MUL_DB_USE                                        k to continue
```

otocol.

Install Protocol

Protocol

Script Name: Ga-Renal

Customization File: Ga-Renal

Install As

Label Ga-Renal

Category User Applications

Script Entry Functions

Validate DataValidate

Startup Func: Main

Help files location

Sub Directory

實際操作

Introduction

Code

Aladdin interface

Procedures

Doing

Α

Β

Γ

Δ

Ε

實際
操作

實際操作

前往第五造影室
操作其他的**workflow**