

Realidade Virtual e Interfaces Modernas

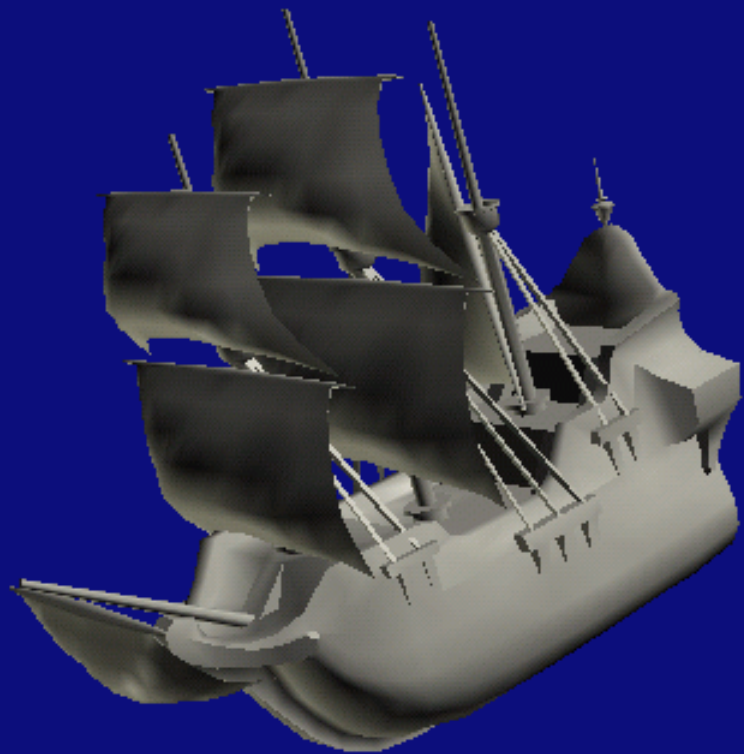
Prof. Carlos Henrique Q. Forster

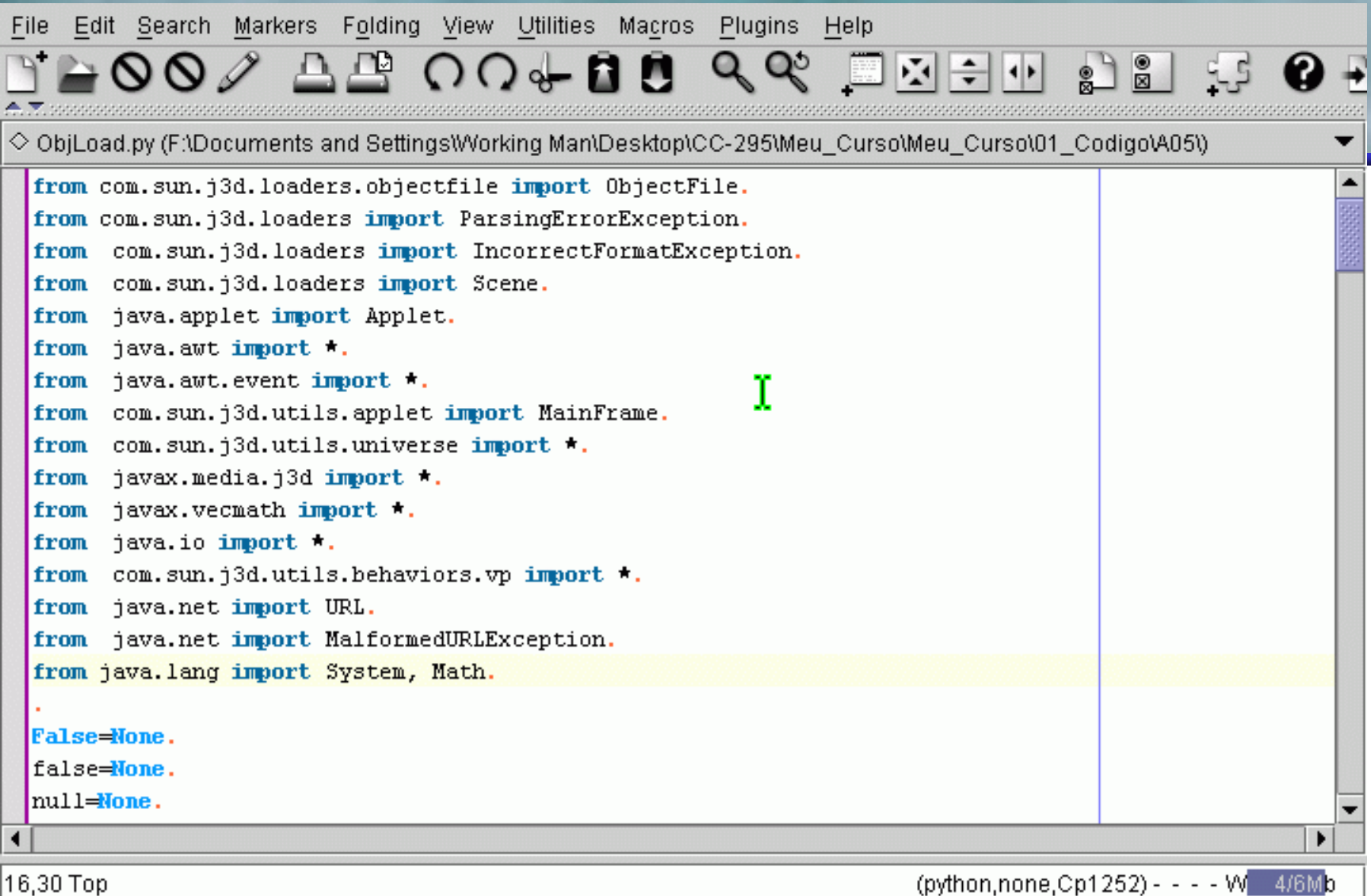
IEC-ITA

Julho/2005

Java3D: Modelagem







The image shows a screenshot of a Python IDE window. The title bar reads "ObjLoad.py (F:\Documents and Settings\Working Man\Desktop\CC-295\Meu_Curso\Meu_Curso\01_Codigo\A05)". The menu bar includes File, Edit, Search, Markers, Folding, View, Utilities, Macros, Plugins, and Help. The toolbar contains various icons for file operations, editing, and navigation. The main text area contains the following Python code:

```
from com.sun.j3d.loaders.objectfile import ObjectFile.  
from com.sun.j3d.loaders import ParsingErrorException.  
from com.sun.j3d.loaders import IncorrectFormatException.  
from com.sun.j3d.loaders import Scene.  
from java.applet import Applet.  
from java.awt import *.  
from java.awt.event import *.  
from com.sun.j3d.utils.applet import MainFrame.  
from com.sun.j3d.utils.universe import *.  
from javax.media.j3d import *.  
from javax.vecmath import *.  
from java.io import *.  
from com.sun.j3d.utils.behaviors.vp import *.  
from java.net import URL.  
from java.net import MalformedURLException.  
from java.lang import System, Math.  
.  
False=None.  
false=None.  
null=None.
```

The status bar at the bottom left shows "16,30 Top" and the bottom right shows "(python,none,Cp1252) - - - W 4/6Mb".

```
File Edit Search Markers Folding View Utilities Macros Plugins Help
System.out.println("Test").
.
spin = False;.
noTriangulate = False;.
noStripify = False;.
creaseAngle = 60.0;.
filename = "./galleon.obj";.
.
.
class ObjLoad(Applet):.
.
    def createSceneGraph(self) :.
##        // Create the root of the branch graph.
        objRoot = BranchGroup().
.
##        // Create a Transformgroup to scale all objects so they.
##        // appear in the scene..
        objScale = TransformGroup();.
        t3d = Transform3D();.
        t3d.setScale(0.7);.
```

16,30 12% (python,none,Cp1252) - - - W 4/6M b

```
File Edit Search Markers Folding View Utilities Macros Plugins Help
ObjLoad.py (F:\Documents and Settings\Working Man\Desktop\CC-295\Meu_Curso\Meu_Curso\01_Codigo\A05)

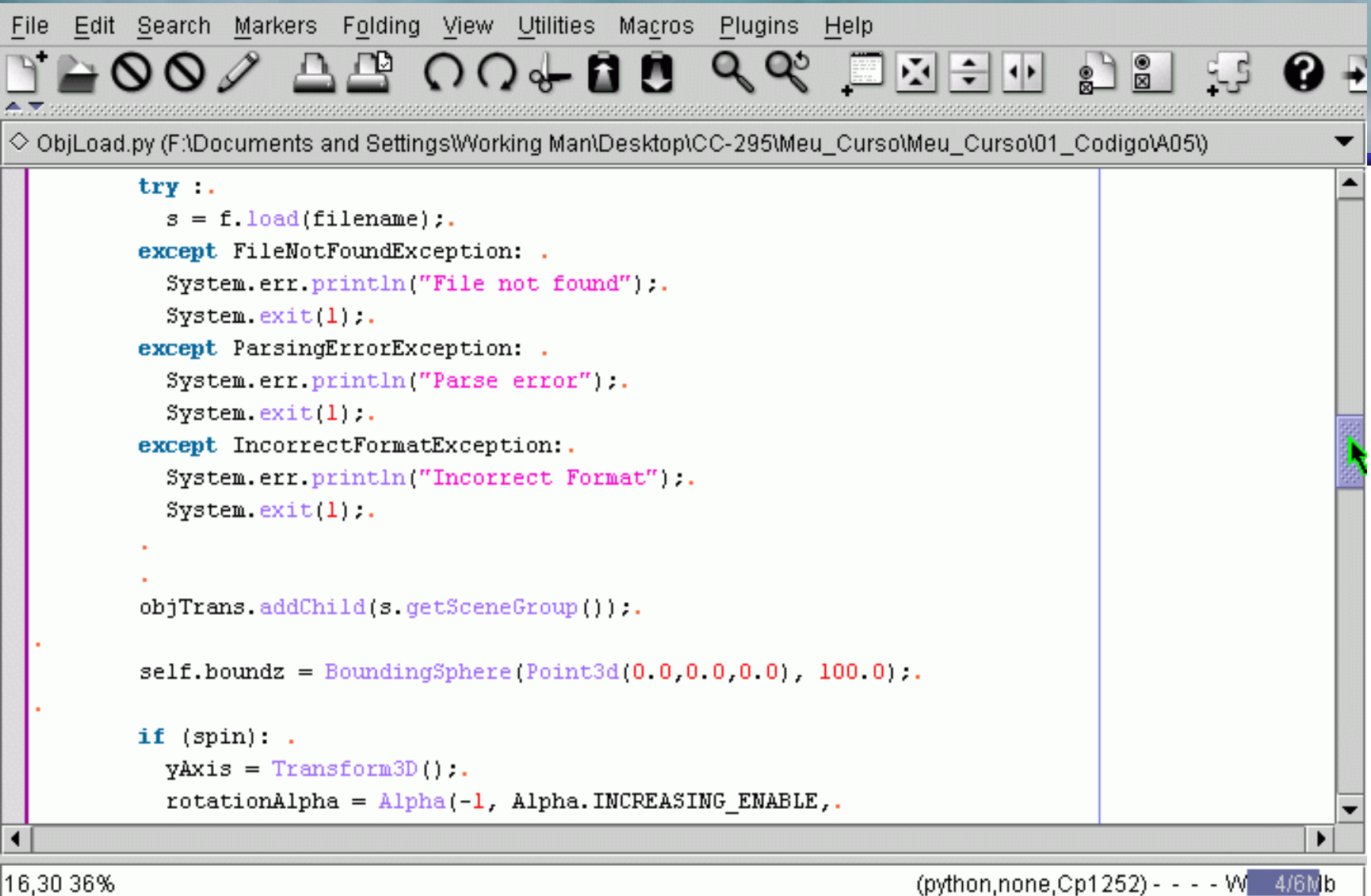
objScale.setTransform(t3d);
objRoot.addChild(objScale);

.
## // Create the transform group node and initialize it to the.
## // identity. Enable the TRANSFORM_WRITE capability so that.
## // our behavior code can modify it at runtime. Add it to the.
## // root of the subgraph..
objTrans = TransformGroup();
objTrans.setCapability(TransformGroup.ALLOW_TRANSFORM_WRITE);
objTrans.setCapability(TransformGroup.ALLOW_TRANSFORM_READ);
objScale.addChild(objTrans);

.

flags = ObjectFile.RESIZE;
if (not noTriangulate): flags |= ObjectFile.TRIANGULATE;
if (not noStripify): flags |= ObjectFile.STRIPIFY;
f = ObjectFile(flags, .
    (float)(creaseAngle * Math.PI / 180.0));
s = None;
try :.
    s = f.load(filename);

16,30 25% (python,none,Cp1252) - - - W 4/6Mb
```



```
File Edit Search Markers Folding View Utilities Macros Plugins Help
ObjLoad.py (F:\Documents and Settings\Working Man\Desktop\CC-295\Meu_Curso\Meu_Curso\01_Codigo\A05)

try :.
    s = f.load(filename);.
except FileNotFoundError: .
    System.err.println("File not found");.
    System.exit(1);.
except ParsingErrorException: .
    System.err.println("Parse error");.
    System.exit(1);.
except IncorrectFormatException: .
    System.err.println("Incorrect Format");.
    System.exit(1);.
.
.
objTrans.addChild(s.getSceneGroup());.

self.boundz = BoundingSphere(Point3d(0.0,0.0,0.0), 100.0);.

if (spin): .
    yAxis = Transform3D();.
    rotationAlpha = Alpha(-1, Alpha.INCREASING_ENABLE,.
```

16,30 36% (python,none,Cp1252) - - - W 4/6M b


```
File Edit Search Markers Folding View Utilities Macros Plugins Help
ObjLoad.py (F:\Documents and Settings\Working Man\Desktop\CC-295\Meu_Curso\Meu_Curso\01_Codigo\A05)

.
objTrans.addChild(s.getSceneGroup());.

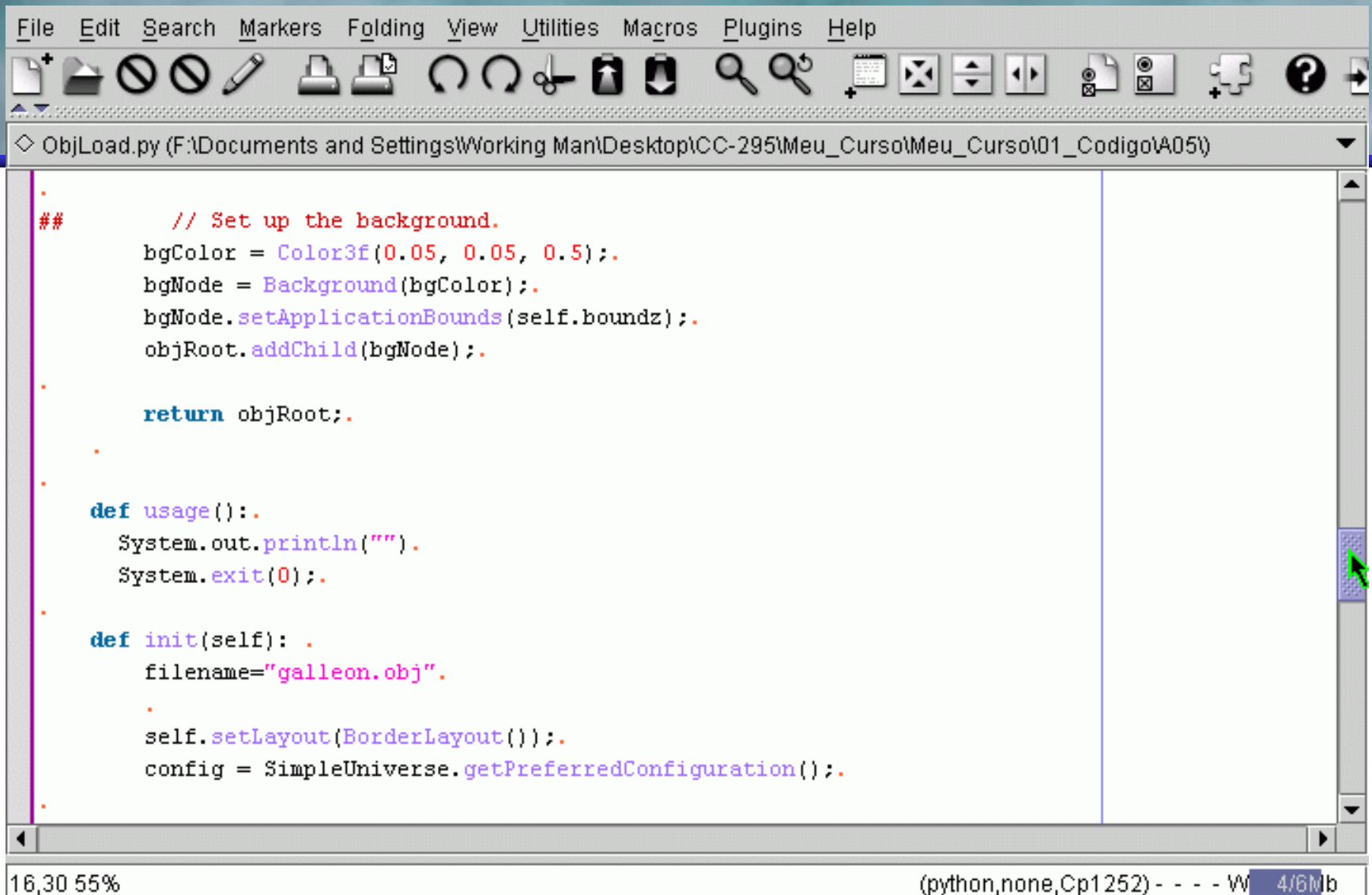
self.boundz = BoundingSphere(Point3d(0.0,0.0,0.0), 100.0);.

if (spin): .
    yAxis = Transform3D();.
    rotationAlpha = Alpha(-1, Alpha.INCREASING_ENABLE,.
                          0, 0,.
                          4000, 0, 0,.
                          0, 0, 0);.

    rotator = \.
        RotationInterpolator(rotationAlpha, objTrans, yAxis, \.
                              0.0, Math.PI*2.0);.
    rotator.setSchedulingBounds(self.boundz);.
    objTrans.addChild(rotator);.

.
## // Set up the background.
```

16,30 43% (python,none,Cp1252) - - - W 4/6Mb



The image shows a code editor window with a menu bar (File, Edit, Search, Markers, Folding, View, Utilities, Macros, Plugins, Help) and a toolbar with various icons. The title bar indicates the file path: ObjLoad.py (F:\Documents and Settings\Working Man\Desktop\CC-295\Meu_Curso\Meu_Curso\01_Codigo\A05\). The code is as follows:

```
.  
##      // Set up the background.  
bgColor = Color3f(0.05, 0.05, 0.5);.  
bgNode = Background(bgColor);.  
bgNode.setApplicationBounds(self.boundz);.  
objRoot.addChild(bgNode);.  
  
return objRoot;.  
  
.br/>.br/>  
def usage():.  
    System.out.println("").  
    System.exit(0);.  
  
.br/>  
def init(self): .  
    filename="galleon.obj".  
  
    self.setLayout(BorderLayout());.  
    config = SimpleUniverse.getPreferredConfiguration();.  
  
.
```

The status bar at the bottom shows "16,30 55%" on the left and "(python,none,Cp1252) - - - W 4/6M b" on the right.

```
File Edit Search Markers Folding View Utilities Macros Plugins Help
[Icons]
ObjLoad.py (F:\Documents and Settings\Working Man\Desktop\CC-295\Meu_Curso\Meu_Curso\01_Codigo\A05)
.
    c = Canvas3D(config);.
    self.add("Center", c);.
.
## // Create a simple scene and attach it to the virtual universe.
scene = self.createSceneGraph();.
self.u = SimpleUniverse(c);.
.
## // add mouse behaviors to the ViewingPlatform.
viewingPlatform = self.u.getViewingPlatform();.
.
pg = PlatformGeometry();.
.
## // Set up the ambient light.
ambientColor = Color3f(0.1, 0.1, 0.1);.
ambientLightNode = AmbientLight(ambientColor);.
ambientLightNode.setInfluencingBounds(self.boundz);.
pg.addChild(ambientLightNode);.
.
## // Set up the directional lights.
```

16,30 66% (python,none,Cp1252) - - - W 4/6M b

```
File Edit Search Markers Folding View Utilities Macros Plugins Help
ObjLoad.py (F:\Documents and Settings\Working Man\Desktop\CC-295\Meu_Curso\Meu_Curso\01_Codigo\A05)

.
## // Set up the directional lights.
light1Color = Color3f(1.0, 1.0, 0.9);.
light1Direction = Vector3f(1.0, 1.0, 1.0);.
light2Color = Color3f(1.0, 1.0, 1.0);.
light2Direction = Vector3f(-1.0, -1.0, -1.0);.
.
light1 = DirectionalLight(light1Color, light1Direction);.
light1.setInfluencingBounds(self.boundz);.
pg.addChild(light1);.
.
light2 = DirectionalLight(light2Color, light2Direction);.
light2.setInfluencingBounds(self.boundz);.
pg.addChild(light2);.
.
viewingPlatform.setPlatformGeometry( pg );.
.
## // This will move the ViewPlatform back a bit so the.
## // objects in the scene can be viewed..
viewingPlatform.setNominalViewingTransform();.

16,30 78% (python,none,Cp1252) - - - W 4/6M/b
```

```
File Edit Search Markers Folding View Utilities Macros Plugins Help
ObjLoad.py (F:\Documents and Settings\Working Man\Desktop\CC-295\Meu_Curso\Meu_Curso\01_Codigo\A05)

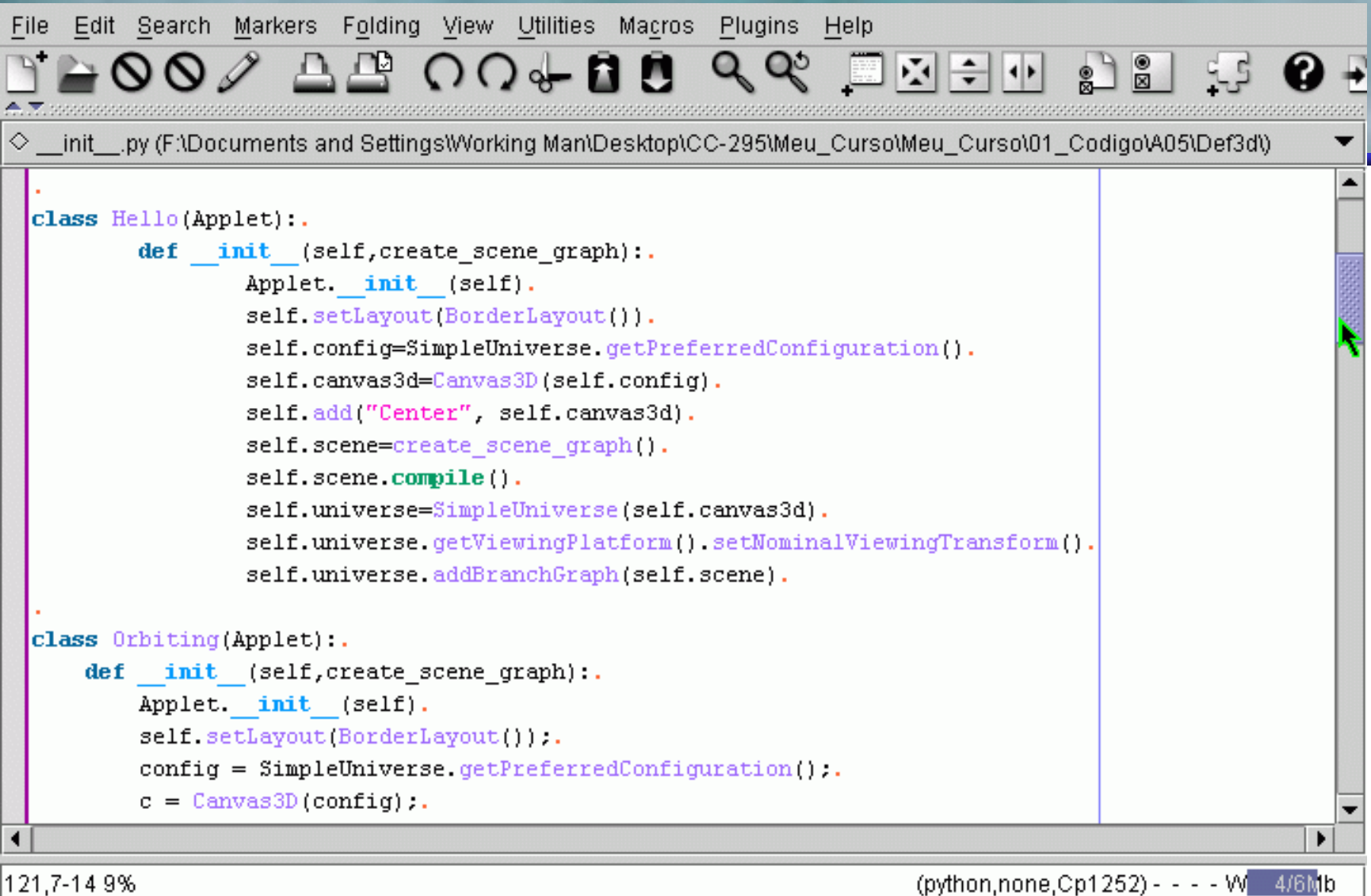
viewingPlatform.setPlatformGeometry( pg );.
.
## // This will move the ViewPlatform back a bit so the.
## // objects in the scene can be viewed..
viewingPlatform.setNominalViewingTransform();.
.
if ( not spin): .
    orbit = OrbitBehavior(c,OrbitBehavior.REVERSE_ALL);.
    self.boundz = BoundingSphere(Point3d(0.0, 0.0, 0.0), 100.0);.
    orbit.setSchedulingBounds(self.boundz);.
    viewingPlatform.setViewPlatformBehavior(orbit);
.
.
self.u.addBranchGraph(scene);.
.
def destroy(self):.
    self.u.cleanup().

MainFrame(ObjLoad(), 700, 700);.
.

16,30 Bot (python,none,Cp1252) - - - W 4/6M/b
```

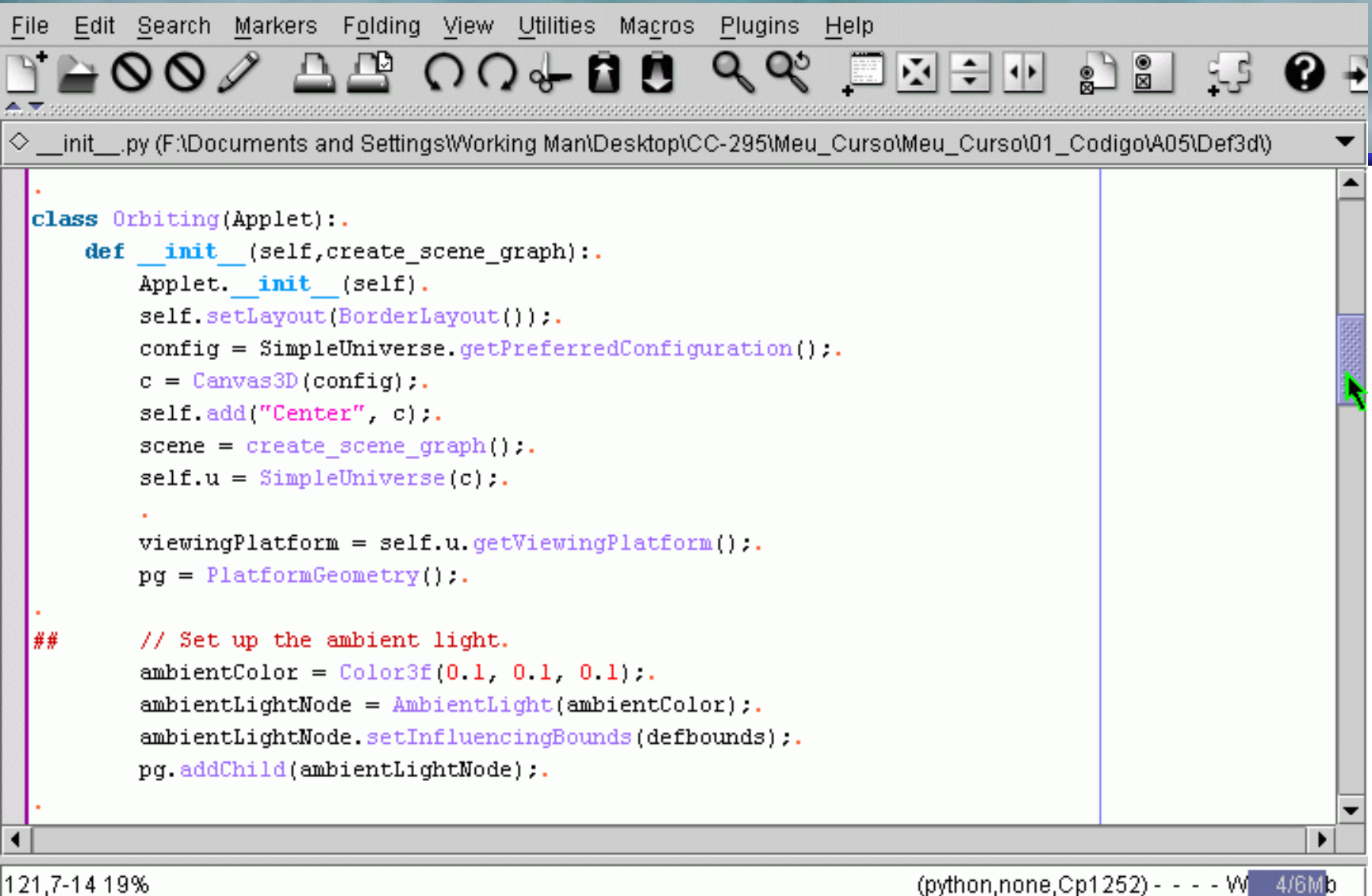
```
File Edit Search Markers Folding View Utilities Macros Plugins Help
[Icons]
__init__.py (F:\Documents and Settings\Working Man\Desktop\CC-295\Meu_Cursor\Meu_Cursor\01_Codigo\A05\Def3d)
from java.applet import Applet.
from java.awt import *.
from com.sun.j3d.utils.universe import *.
from com.sun.j3d.utils.geometry import *.
from com.sun.j3d.utils.applet import MainFrame.
from javax.media.j3d import *.
from java.lang import Math.
from javax.vecmath import *.
from com.sun.j3d.utils.behaviors.vp import *.
.
.
def bounds=BoundingSphere(Point3d(0,0,0),80).
.
class Hello(Applet):.
    def __init__(self,create_scene_graph):.
        Applet.__init__(self).
        self.setLayout(BorderLayout()).
        self.config=SimpleUniverse.getPreferredConfiguration().
        self.canvas3d=Canvas3D(self.config).
        self.add("Center", self.canvas3d).
```

121,7-14 Top (python,none,Cp1252) - - - W 4/6M b



```
File Edit Search Markers Folding View Utilities Macros Plugins Help
__init__.py (F:\Documents and Settings\Working Man\Desktop\CC-295\Meu_Curso\Meu_Curso\01_Codigo\A05\Def3d\__init__.py)
class Hello(Applet):.
    def __init__(self,create_scene_graph):.
        Applet.__init__(self).
        self.setLayout(BorderLayout()).
        self.config=SimpleUniverse.getPreferredConfiguration().
        self.canvas3d=Canvas3D(self.config).
        self.add("Center", self.canvas3d).
        self.scene=create_scene_graph().
        self.scene.compile().
        self.universe=SimpleUniverse(self.canvas3d).
        self.universe.getViewingPlatform().setNominalViewingTransform().
        self.universe.addBranchGraph(self.scene).
class Orbiting(Applet):.
    def __init__(self,create_scene_graph):.
        Applet.__init__(self).
        self.setLayout(BorderLayout());.
        config = SimpleUniverse.getPreferredConfiguration();.
        c = Canvas3D(config);.
```

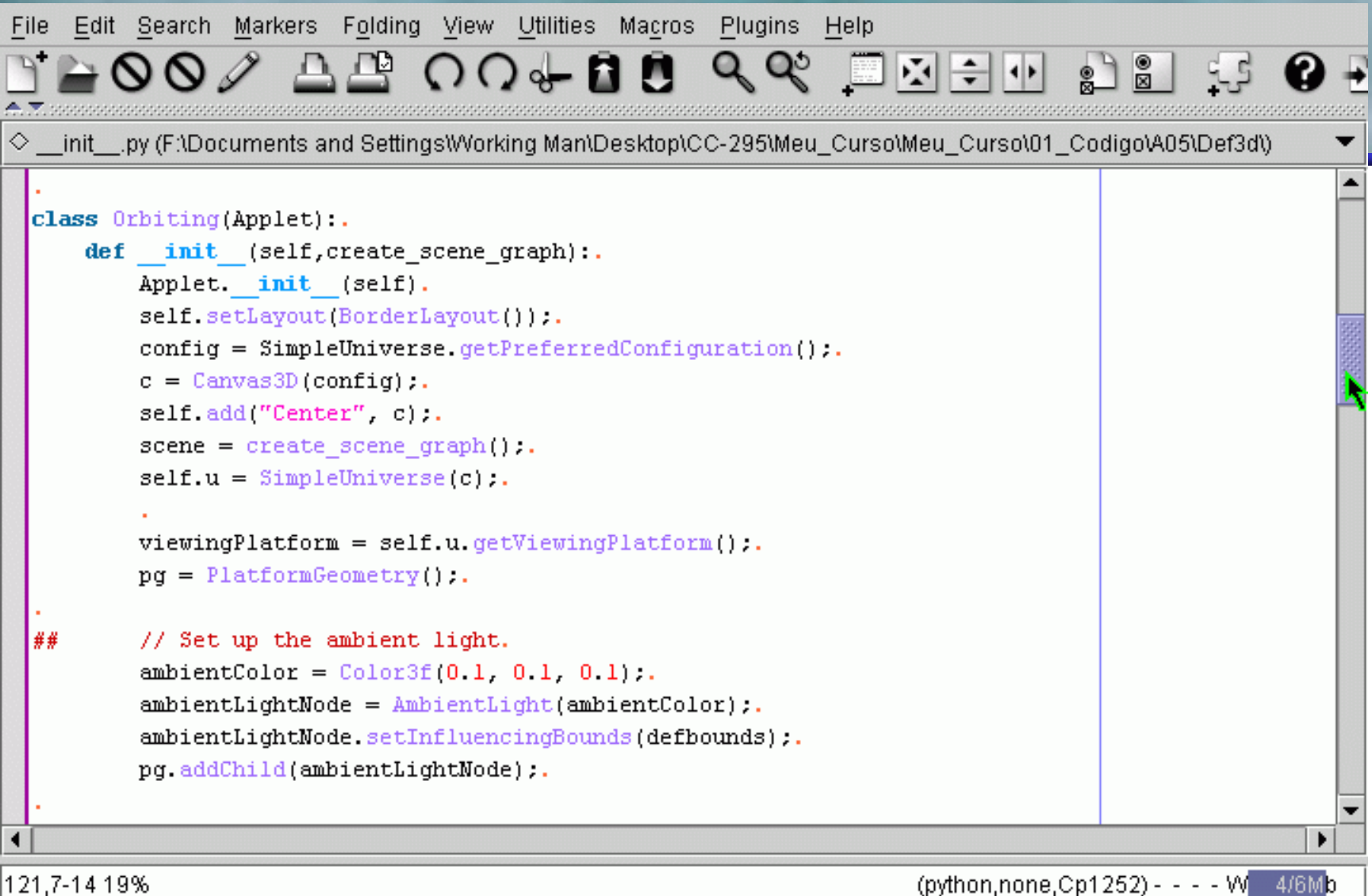
121,7-14 9% (python,none,Cp1252) - - - W 4/6Mb



The image shows a screenshot of an IDE window. The title bar reads: `__init__.py (F:\Documents and Settings\Working Man\Desktop\CC-295\Meu_Curso\Meu_Curso\01_Codigo\A05\Def3d)`. The code in the editor is as follows:

```
.
class Orbiting(Applet):.
    def __init__(self,create_scene_graph):.
        Applet.__init__(self).
        self.setLayout(BorderLayout());.
        config = SimpleUniverse.getPreferredConfiguration();.
        c = Canvas3D(config);.
        self.add("Center", c);.
        scene = create_scene_graph();.
        self.u = SimpleUniverse(c);.
        .
        viewingPlatform = self.u.getViewingPlatform();.
        pg = PlatformGeometry();.
        .
        ## // Set up the ambient light.
        ambientColor = Color3f(0.1, 0.1, 0.1);.
        ambientLightNode = AmbientLight(ambientColor);.
        ambientLightNode.setInfluencingBounds(defbounds);.
        pg.addChild(ambientLightNode);.
        .
```

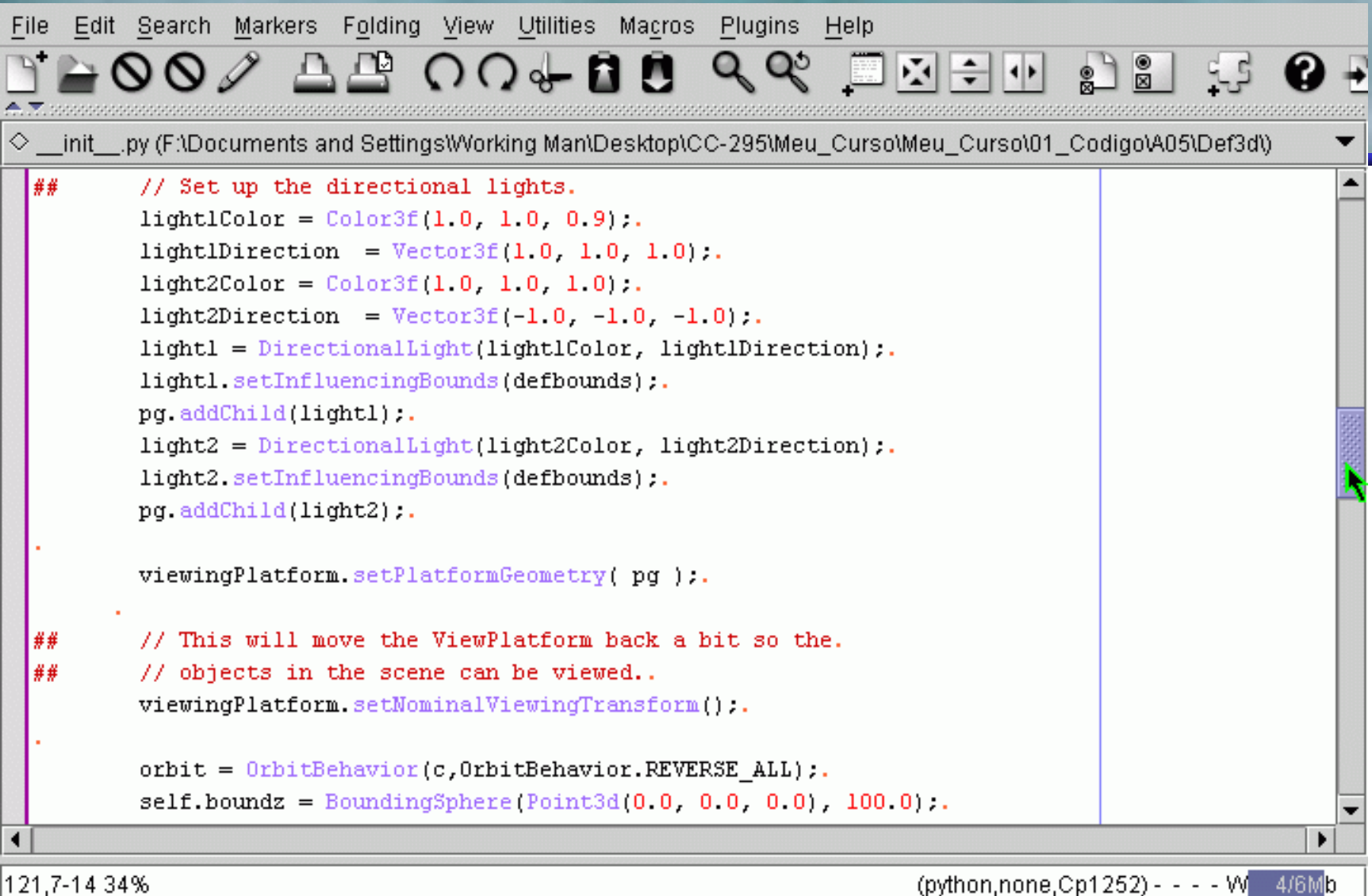
The status bar at the bottom left shows `121,7-14 19%`. The status bar at the bottom right shows `(python,none,Cp1252) - - - W 4/6Mb`.



The image shows a screenshot of an IDE window. The title bar reads: `__init__.py (F:\Documents and Settings\Working Man\Desktop\CC-295\Meu_Curso\Meu_Curso\01_Codigo\A05\Def3d)`. The code in the editor is as follows:

```
.
class Orbiting(Applet):.
    def __init__(self,create_scene_graph):.
        Applet.__init__(self).
        self.setLayout(BorderLayout());.
        config = SimpleUniverse.getPreferredConfiguration();.
        c = Canvas3D(config);.
        self.add("Center", c);.
        scene = create_scene_graph();.
        self.u = SimpleUniverse(c);.
        .
        viewingPlatform = self.u.getViewingPlatform();.
        pg = PlatformGeometry();.
        .
        ## // Set up the ambient light.
        ambientColor = Color3f(0.1, 0.1, 0.1);.
        ambientLightNode = AmbientLight(ambientColor);.
        ambientLightNode.setInfluencingBounds(defbounds);.
        pg.addChild(ambientLightNode);.
        .
```

The status bar at the bottom shows: `121,7-14 19%` on the left and `(python,none,Cp1252) - - - W 4/6Mb` on the right.



The image shows a code editor window with a menu bar (File, Edit, Search, Markers, Folding, View, Utilities, Macros, Plugins, Help) and a toolbar with various icons. The title bar indicates the file path: `__init__.py (F:\Documents and Settings\Working Man\Desktop\CC-295\Meu_Curso\Meu_Curso\01_Codigo\A05\Def3d)`. The code is as follows:

```
## // Set up the directional lights.
light1Color = Color3f(1.0, 1.0, 0.9);.
light1Direction = Vector3f(1.0, 1.0, 1.0);.
light2Color = Color3f(1.0, 1.0, 1.0);.
light2Direction = Vector3f(-1.0, -1.0, -1.0);.
light1 = DirectionalLight(light1Color, light1Direction);.
light1.setInfluencingBounds(defbounds);.
pg.addChild(light1);.
light2 = DirectionalLight(light2Color, light2Direction);.
light2.setInfluencingBounds(defbounds);.
pg.addChild(light2);.

viewingPlatform.setPlatformGeometry( pg );.

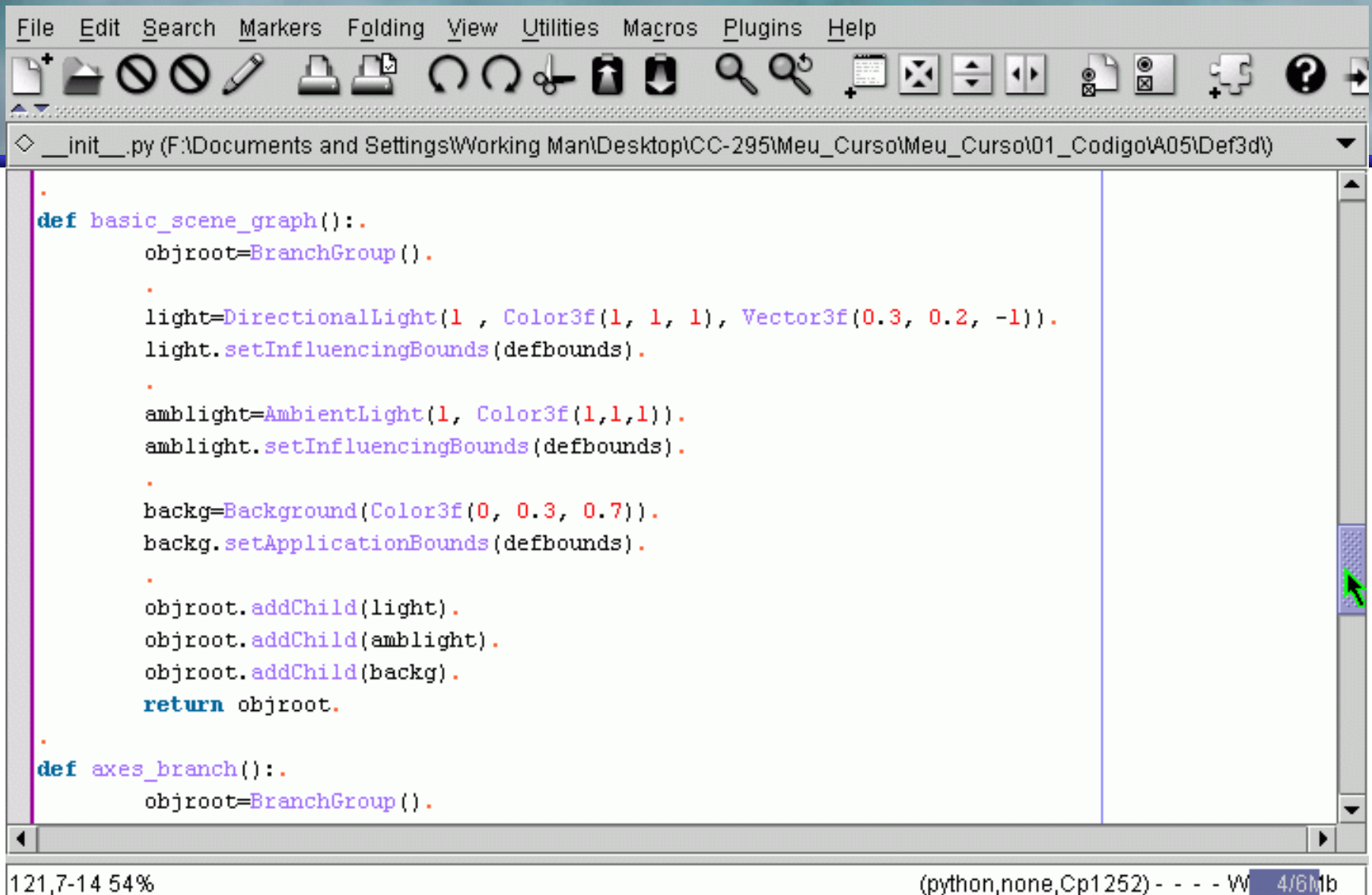
## // This will move the ViewPlatform back a bit so the.
## // objects in the scene can be viewed..
viewingPlatform.setNominalViewingTransform();.

orbit = OrbitBehavior(c,OrbitBehavior.REVERSE_ALL);.
self.boundz = BoundingSphere(Point3d(0.0, 0.0, 0.0), 100.0);.
```

The status bar at the bottom shows the line range `121,7-14 34%` and the environment `(python,none,Cp1252) - - - W 4/6Mb`.

```
File Edit Search Markers Folding View Utilities Macros Plugins Help
[Icons]
__init__.py (F:\Documents and Settings\Working Man\Desktop\CC-295\Meu_Curso\Meu_Curso\01_Codigo\A05\Def3d)
.
    orbit = OrbitBehavior(c,OrbitBehavior.REVERSE_ALL);.
    self.boundz = BoundingSphere(Point3d(0.0, 0.0, 0.0), 100.0);.
    orbit.setSchedulingBounds(defbounds);.
    viewingPlatform.setViewPlatformBehavior(orbit);.
.
    self.u.addBranchGraph(scene);.
.
.
def basic_scene_graph():.
    objroot=BranchGroup().
    .
    light=DirectionalLight(1, Color3f(1, 1, 1), Vector3f(0.3, 0.2, -1)).
    light.setInfluencingBounds(defbounds).
    .
    amblight=AmbientLight(1, Color3f(1,1,1)).
    amblight.setInfluencingBounds(defbounds).
    .
    backg=Background(Color3f(0, 0.3, 0.7)).
    backg.setApplicationBounds(defbounds).
```

121,7-14 48% (python,none,Cp1252) - - - W 4/6Mb



The image shows a screenshot of a code editor window. The title bar reads: `__init__.py (F:\Documents and Settings\Working Man\Desktop\CC-295\Meu_Cursor\Meu_Cursor\01_Codigo\A05\Def3d\)`. The code is as follows:

```
.
def basic_scene_graph():.
    objroot=BranchGroup().

    light=DirectionalLight(1 , Color3f(1, 1, 1), Vector3f(0.3, 0.2, -1)).
    light.setInfluencingBounds(defbounds).

    amblight=AmbientLight(1, Color3f(1,1,1)).
    amblight.setInfluencingBounds(defbounds).

    backg=Background(Color3f(0, 0.3, 0.7)).
    backg.setApplicationBounds(defbounds).

    objroot.addChild(light).
    objroot.addChild(amblight).
    objroot.addChild(backg).
    return objroot.

def axes_branch():.
    objroot=BranchGroup().
```

The status bar at the bottom shows: `121,7-14 54%` on the left and `(python,none,Cp1252) - - - W 4/6Mb` on the right.

```
File Edit Search Markers Folding View Utilities Macros Plugins Help
[Icons]
__init__.py (F:\Documents and Settings\Working Man\Desktop\CC-295\Meu_Cursor\Meu_Cursor\01_Codigo\A05\Def3d)
.
def axes_branch():
    objroot=BranchGroup().
    axisx=LineArray(2,LineArray.COORDINATES|LineArray.COLOR_3).
    axisy=LineArray(2,LineArray.COORDINATES|LineArray.COLOR_3).
    axisz=LineArray(2,LineArray.COORDINATES|LineArray.COLOR_3).
    axisz.setCoordinate(0,Point3f(0,0,0)).
    axisz.setCoordinate(1,Point3f(0,0,1)).
    axisz.setColor(0,Color3f(0,0.5,1)).
    axisz.setColor(1,Color3f(0,0.5,1)).
    axisx.setCoordinate(0,Point3f(0,0,0)).
    axisx.setCoordinate(1,Point3f(1,0,0)).
    axisx.setColor(0,Color3f(1,0,0.5)).
    axisx.setColor(1,Color3f(1,0,0.5)).
    axisy.setCoordinate(0,Point3f(0,0,0)).
    axisy.setCoordinate(1,Point3f(0,1,0)).
    axisy.setColor(0,Color3f(0,1,0)).
    axisy.setColor(1,Color3f(0,1,0)).
    objroot.addChild(Shape3D(axisx)).
    objroot.addChild(Shape3D(axisy)).
```

121,7-14 67% (python,none,Cp1252) - - - W 4/6M b

```
File Edit Search Markers Folding View Utilities Macros Plugins Help
[Icons]
__init__.py (F:\Documents and Settings\Working Man\Desktop\CC-295\Meu_Curso\Meu_Curso\01_Codigo\A05\Def3d)
axisx=LineArray(2,LineArray.COORDINATES|LineArray.COLOR_3).
axisy=LineArray(2,LineArray.COORDINATES|LineArray.COLOR_3).
axisz=LineArray(2,LineArray.COORDINATES|LineArray.COLOR_3).
axisz.setCoordinate(0,Point3f(0,0,0)).
axisz.setCoordinate(1,Point3f(0,0,1)).
axisz.setColor(0,Color3f(0,0.5,1)).
axisz.setColor(1,Color3f(0,0.5,1)).
axisx.setCoordinate(0,Point3f(0,0,0)).
axisx.setCoordinate(1,Point3f(1,0,0)).
axisx.setColor(0,Color3f(1,0,0.5)).
axisx.setColor(1,Color3f(1,0,0.5)).
axisy.setCoordinate(0,Point3f(0,0,0)).
axisy.setCoordinate(1,Point3f(0,1,0)).
axisy.setColor(0,Color3f(0,1,0)).
axisy.setColor(1,Color3f(0,1,0)).
objroot.addChild(Shape3D(axisx)).
objroot.addChild(Shape3D(axisy)).
objroot.addChild(Shape3D(axisz)).
return objroot.
```

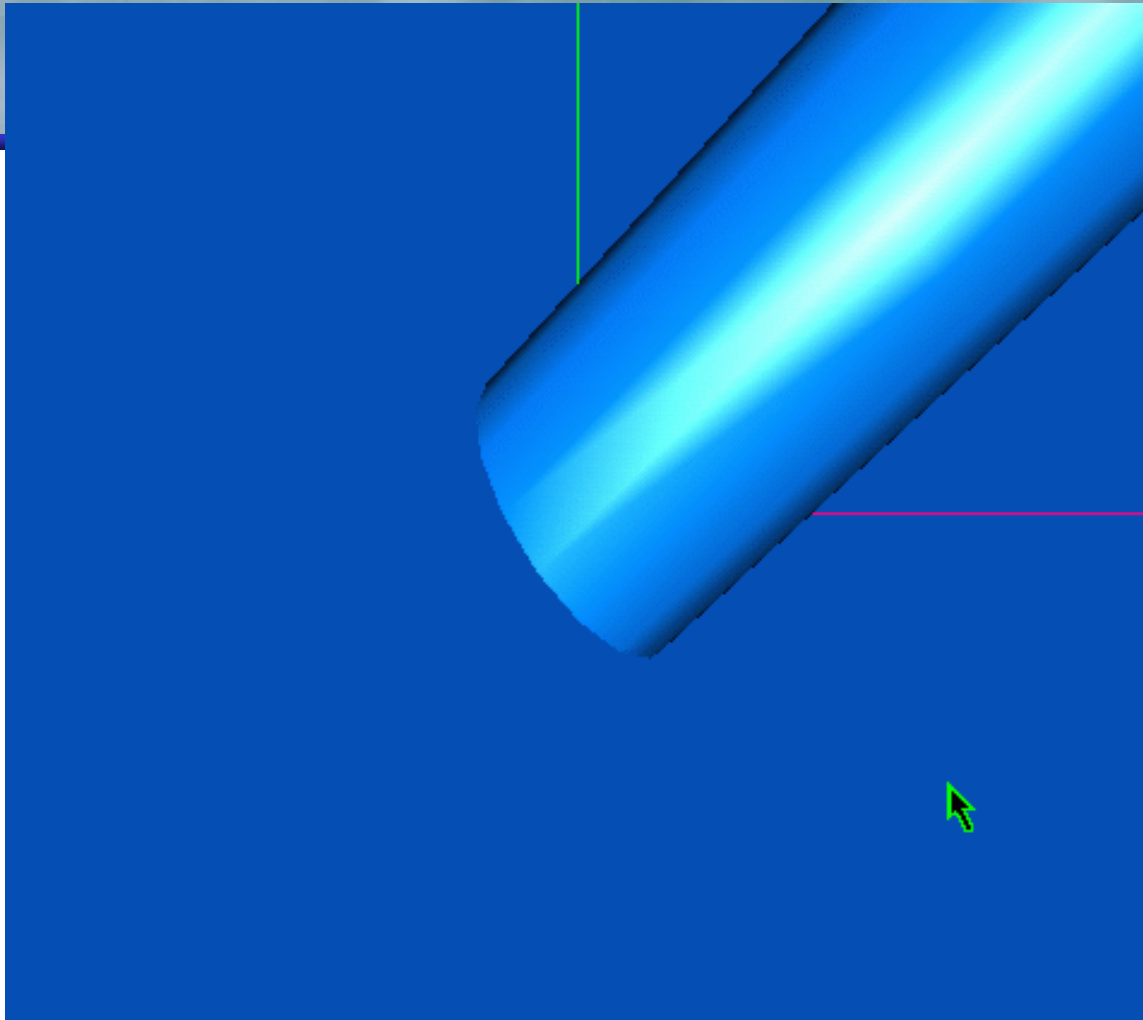
121,7-14 69% (python,none,Cp1252) - - - W 4/6M b

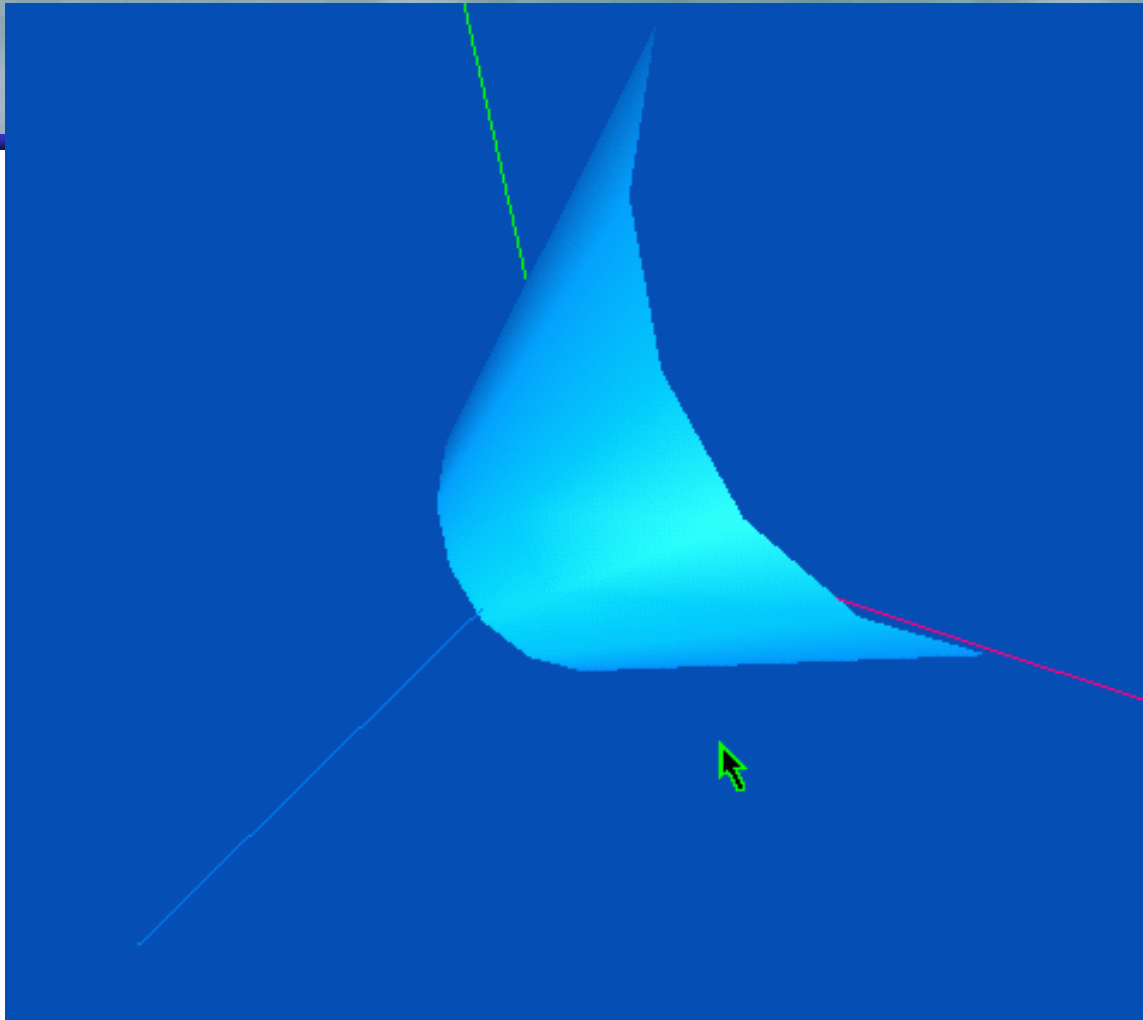
```
File Edit Search Markers Folding View Utilities Macros Plugins Help
[Icons]
__init__.py (F:\Documents and Settings\Working Man\Desktop\CC-295\Meu_Curso\Meu_Curso\01_Codigo\A05\Def3d\
def rotation_y_vector(p1,p2):.
    m3f=Matrix3f().
    v1=Vector3f(p2).
    v1.sub(p1).
    v1.normalize().
    v2=Vector3f(0,0,1).
    if(abs(v1.dot(v2)) < 0.7):.
        v0=Vector3f().
        v0.cross(v2,v1).
        v2.cross(v0,v1).
    else:.
        v0=Vector3f(1,0,0).
        v2.cross(v1,v0).
        v0.cross(v1,v2).
    m3f.setRow(0,v0).
    m3f.setRow(1,v1).
    m3f.setRow(2,v2).
    return m3f.
.
```

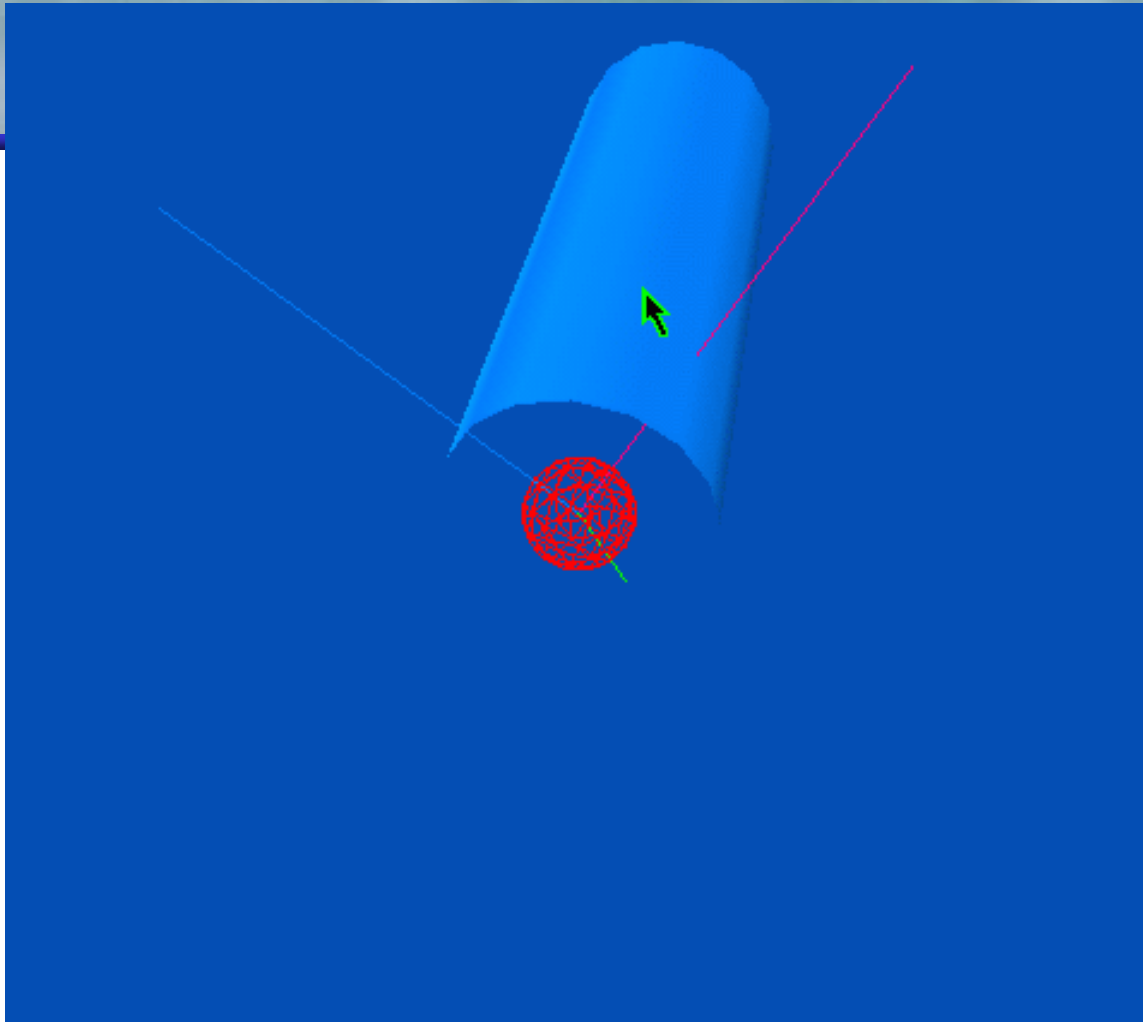
111,1 Bot (python,none,Cp1252) - - - W 4/6Mb

```
File Edit Search Markers Folding View Utilities Macros Plugins Help
[Icons]
CylTest.py (F:\Documents and Settings\Working Man\Desktop\CC-295\Meu_Curso\Meu_Curso\01_Codigo\A05)
from Def3d import *.
from Cyl import *.
.
def scene_graph():.
    objroot=basic_scene_graph().
    objroot.addChild(cyl(Point3f(0,0,0),Point3f(1,1,1),0.3,ap=plastic("teal"))).
    objroot.addChild(axes_branch()).
    objroot.addChild( Sphere(0.1,wireframe_red() ) ).
    return objroot.
.
mf=MainFrame(Orbiting(scene_graph),256,256).
```

1,1 All (python,none,Cp1252) - - - W 4/6Mb







```
File Edit Search Markers Folding View Utilities Macros Plugins Help
# Cyl.
.
from Def3d import *.
from Materials import *.
from java.lang import Math.
.
def cyl(p1,p2,r,angdivs=16,hdivs=2,caps=0,ap=plastic_red()):.
    root=BranchGroup().
    .
    s3d=Shape3D().
    s3d.setAppearance(ap).
    .
    h=p1.distance(p2).
    .
    vcount=(angdivs+1)*2*hdivs.
    vertexmode=GeometryArray.COORDINATES|GeometryArray.NORMALS.
    main_strip=TriangleStripArray(vcount,vertexmode,[vcount]).
    print vcount.
    for j in range(hdivs):.
        s=j*1.0/hdivs.
```

51,1 Top (python,none,Cp1252) - - - W 4/6M b

```
File Edit Search Markers Folding View Utilities Macros Plugins Help
[Icons]
__init__.py (F:\Documents and Settings\Working Man\Desktop\CC-295\Meu_Cursor\Meu_Cursor\01_Codigo\A05\Cyl)
for i in range(angdivs+1):.
    t=(i+0.0)/angdivs.
    x=r*Math.cos(t*2*Math.PI).
    y=h*s.
    z=r*Math.sin(t*2*Math.PI).
    T1=Vector3f(-r*2.0*Math.PI*Math.sin(2.0*Math.PI*t),.
        0,.
        r*2.0*Math.PI*Math.cos(2.0*Math.PI*t)).
    T2=Vector3f(0,h,0).
    T1.cross(T2,T1).
    T1.normalize().
    # print [i,j,2*i+(angdivs+1)*2*j,x,y,z].
    main_strip.setCoordinate(2*i+(angdivs+1)*2*j,.
        Point3f(x,y,z)).
    main_strip.setNormal(2*i+(angdivs+1)*2*j,T1).
    x=r*Math.cos(t*2*Math.PI).
    y=h*s+h/hdivs.
    z=r*Math.sin(t*2*Math.PI).
    # print[i,j,2*i+(angdivs+1)*2*j+1,x,y,z].
    main_strip.setCoordinate(2*i+(angdivs+1)*2*j+1,.
I
```

51,1 35% (python,none,Cp1252) - - - W 4/6 Mb

```
File Edit Search Markers Folding View Utilities Macros Plugins Help
[Icons]
__init__.py (F:\Documents and Settings\Working Man\Desktop\CC-295\Meu_Cursor\Meu_Cursor\01_Codigo\A05\Cyl\
    z=r*Math.sin(t*2*Math.PI).
    # print[i,j,2*i+(angdivs+1)*2*j+1,x,y,z].
    main_strip.setCoordinate(2*i+(angdivs+1)*2*j+1,.
        Point3f(x,y,z)).
    main_strip.setNormal(2*i+(angdivs+1)*2*j+1,T1).
s3d.setGeometry(main_strip).
.
if caps: s3d.addGeometry(caps_1).
if caps: s3d.addGeometry(caps_2).
.
m3f=rotation_y_vector(p1, p2).
t3d=Transform3D(Matrix3f(m3f),Vector3f(p1),1.0).
.
tg=TransformGroup(t3d).
.
tg.addChild(s3d).
root.addChild(tg).
return root.
.
.
51,1 Bot (python,none,Cp1252) - - - W 4/6Mb
```

```
File Edit Search Markers Folding View Utilities Macros Plugins Help
[Icons]
Dna.py (F:\Documents and Settings\Working Man\Desktop\CC-295\Meu_Curso\Meu_Curso\01_Codigo\A05\
from Def3d import *.
from Materials import *.
from Helix import *.
from Cyl import *.
.
def scenegraph():.
    objroot=BranchGroup().
    .
    p1=Point3f(0,-0.7,0).
    p2=Point3f(0,0.7,0).
    .
    .
    objroot.addChild( helix( p1, p2,.
        0.1, 0.25, steps=1, ap=plastic("yellow"))).
    objroot.addChild( helix( p1, p2,.
        0.1, 0.25, steps=1, ap=plastic("blue"),phase=Math.PI/4.0)).
    .
    .
    h=p1.distance(p2).
    .
```

42,14-21 Top (python,none,Cp1252) - - - W 4/6Mb

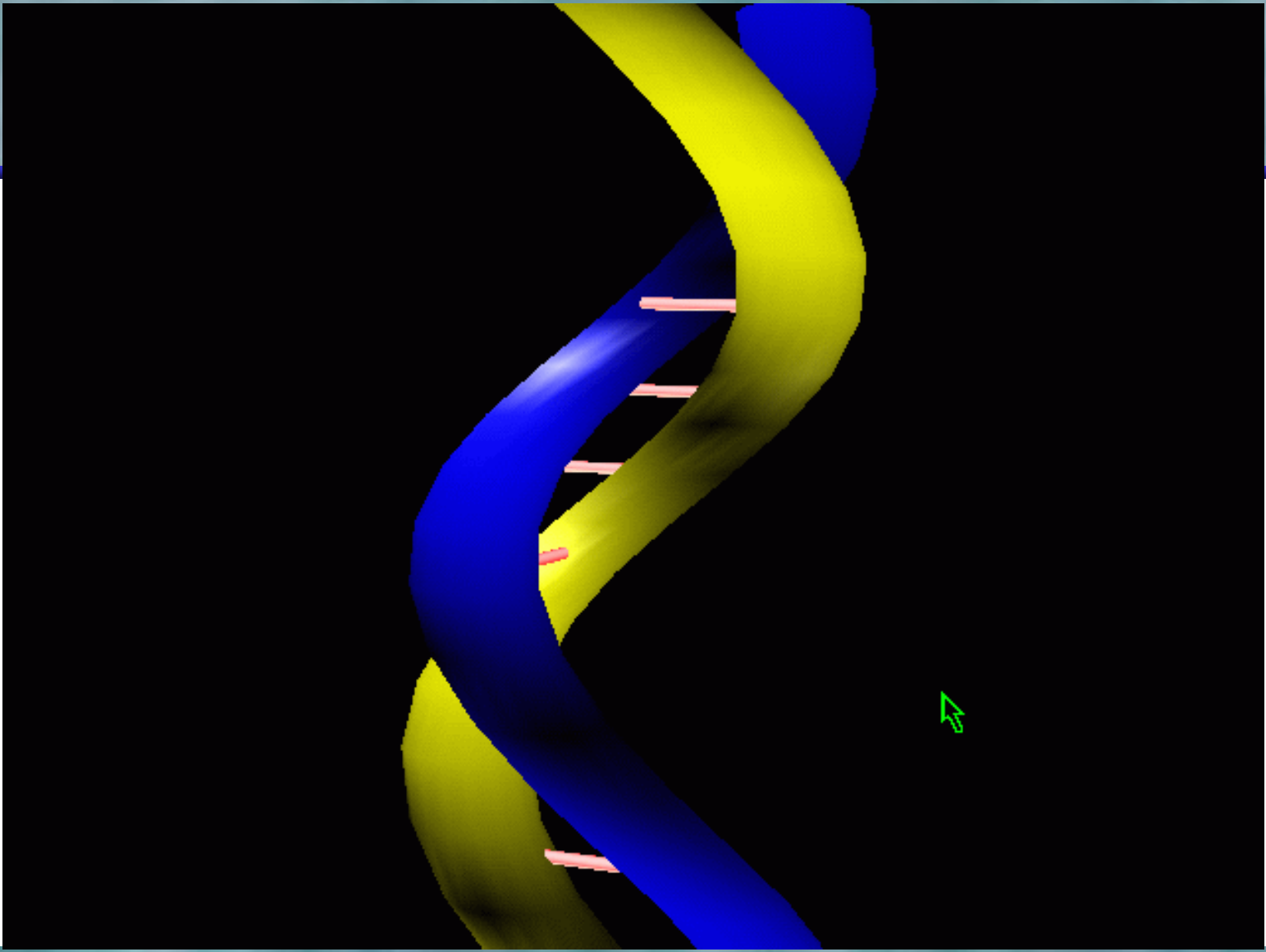
```
File Edit Search Markers Folding View Utilities Macros Plugins Help
[Icons]
Dna.py (F:\Documents and Settings\Working Man\Desktop\CC-295\Meu_Curso\Meu_Curso\01_Codigo\A05\
cylset=BranchGroup().
cyls=10.
r2=0.25.
phase=Math.PI/4.0.
for j in range(cyls):.
    s=j*1.0/cyls.
    ss=(j+1.0)/cyls.
    x0=r2*Math.cos(2*Math.PI*s).
    y0=h*(s).
    z0=r2*Math.sin(2*Math.PI*s).
    x1=r2*Math.cos(2*Math.PI*(s+phase)).
    y1=h*(s).
    z1=r2*Math.sin(2*Math.PI*(s+phase)).
    cylset.addChild(.
        cyl(Point3f(x0,y0,z0),Point3f(x1,y1,z1),0.01,.
            ap=emissive("red"))).

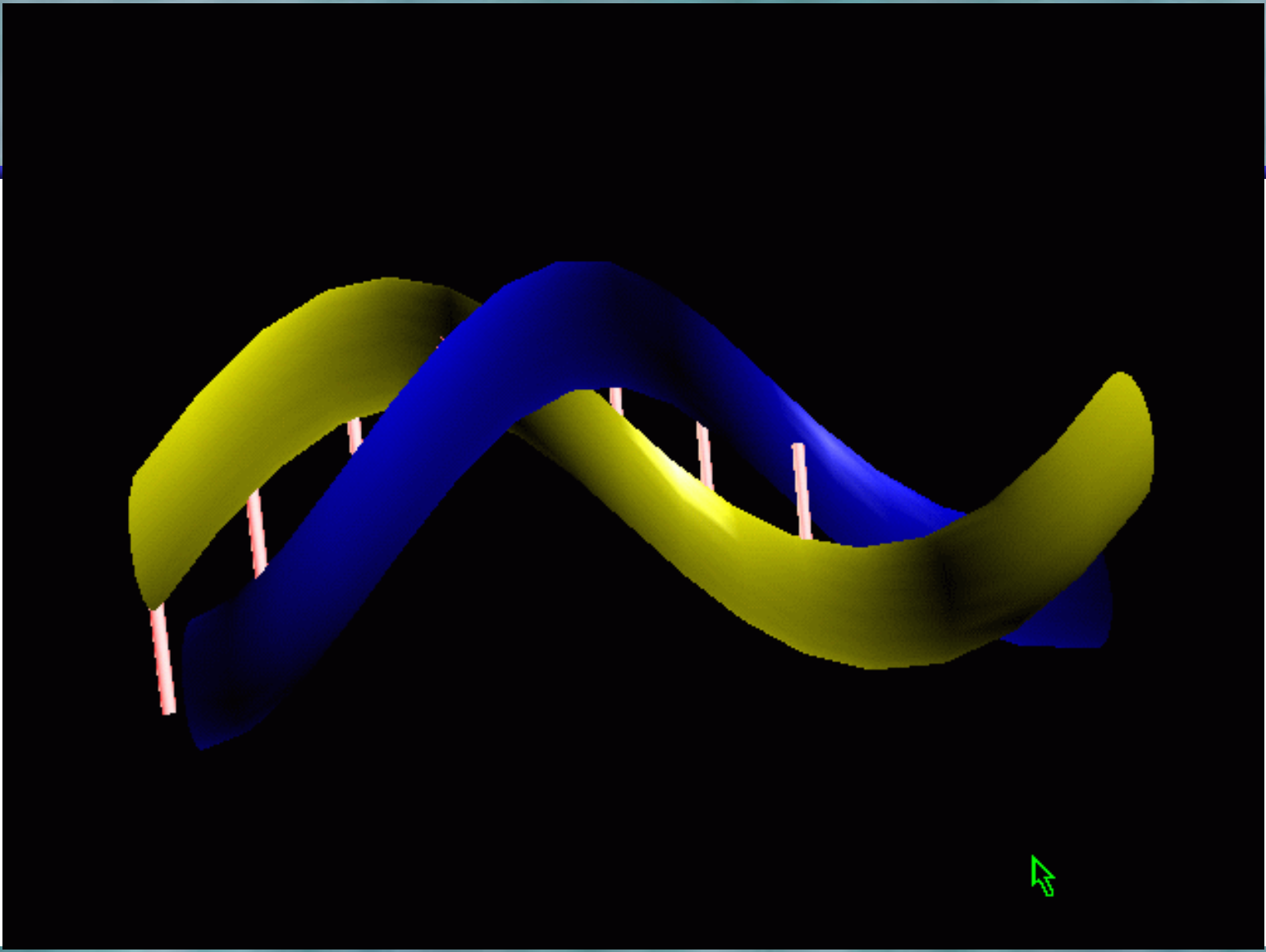
m3f=rotation_y_vector(p1, p2).
t3d=Transform3D(Matrix3f(m3f),Vector3f(p1),1.0).

42,14-21 36% (python,none,Cp1252) - - - W 4/6Mb
```



```
File Edit Search Markers Folding View Utilities Macros Plugins Help
[Icons]
Dna.py (F:\Documents and Settings\Working Man\Desktop\CC-295\Meu_Curso\Meu_Curso\01_Codigo\A05\
    ap=emissive("red")).
.
m3f=rotation_y_vector(p1, p2).
t3d=Transform3D(Matrix3f(m3f),Vector3f(p1),1.0).
.
rota=Transform3D().
rota.rotY(0*Math.PI/16).
.
t3d.mul(t3d,rota).
.
tg=TransformGroup(t3d).
tg.addChild(cylset).
objroot.addChild(tg).
.
return objroot.
.
mf=MainFrame(Orbiting(scenegraph),640,480).
.
.
.
42,14-21 Bot (python,none,Cp1252) - - - W 4/6M b
```





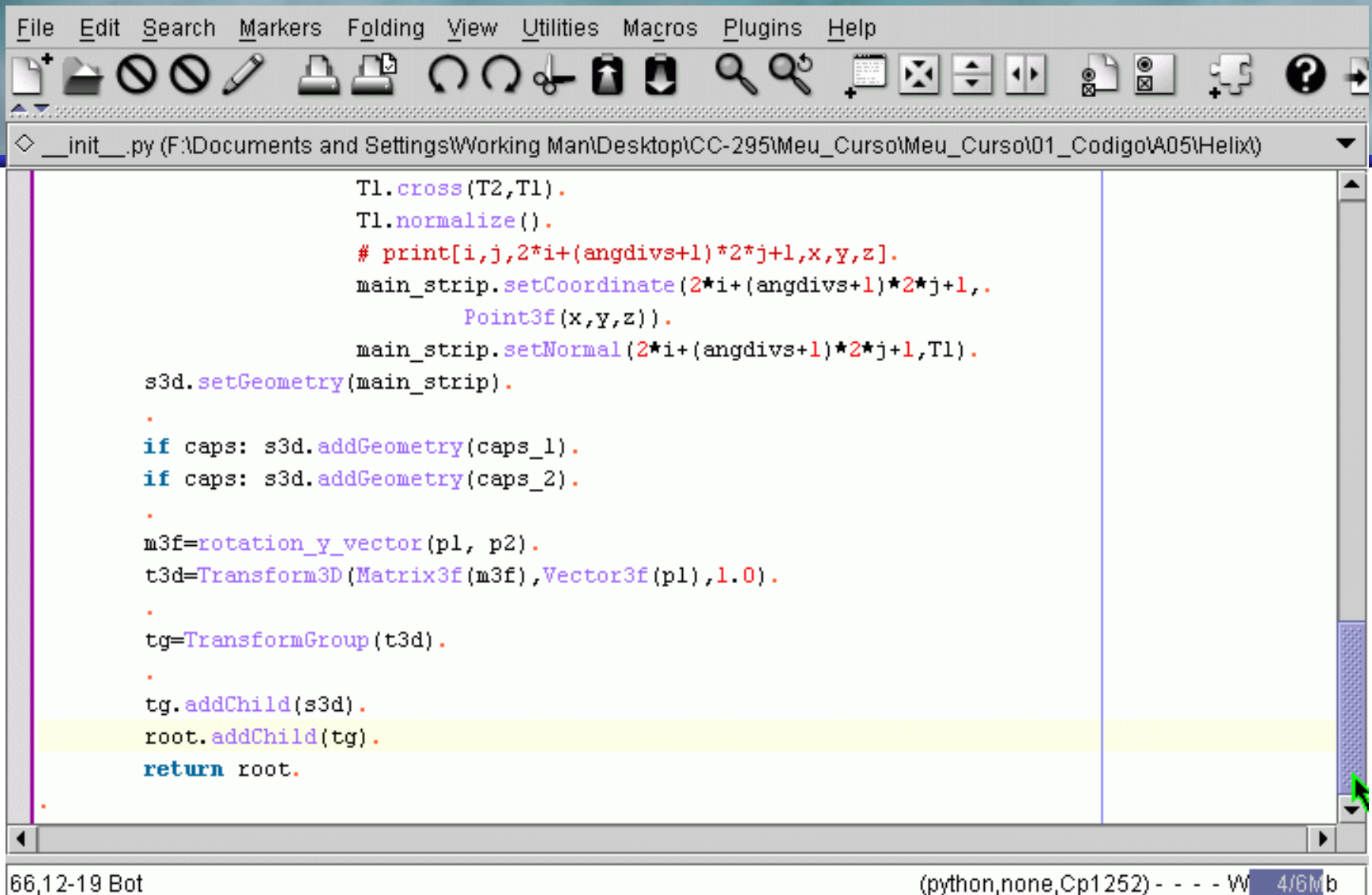
```
File Edit Search Markers Folding View Utilities Macros Plugins Help
[Icons]
__init__.py (F:\Documents and Settings\Working Man\Desktop\CC-295\Meu_Curso\Meu_Curso\01_Codigo\A05\Helix)
# Helix.
.
from Def3d import *.
from Materials import *.
from java.lang import Math.
.
def helix(p1,p2,r1, r2, phase=0.0, angdivs=16, hdivs=16,.
    steps=1, caps=0, ap=plastic_red(), funct=None):.
    root=BranchGroup().
    .
    s3d=Shape3D().
    s3d.setAppearance(ap).
    .
    h=p1.distance(p2)/steps.
    .
    vcount=(angdivs+1)*2*hdivs.
    vertexmode=GeometryArray.COORDINATES|GeometryArray.NORMALS.
    main_strip=TriangleStripArray(vcount,vertexmode,[vcount]).
    print vcount.
    for j in range(hdivs):.
```

66,12-19 Top (python,none,Cp1252) - - - W 4/6Mb

```
File Edit Search Markers Folding View Utilities Macros Plugins Help
[Icons]
__init__.py (F:\Documents and Settings\Working Man\Desktop\CC-295\Meu_Curso\Meu_Curso\01_Codigo\A05\Helix)
s=j*1.0/hdivs+phase.
ss=(j+1.0)/hdivs+phase.
for i in range(angdivs+1):.
    t=(i+0.0)/angdivs.
    x=r1*Math.cos(t*2*Math.PI)+r2*Math.cos(2*Math.PI*s).
    y=h*(s-phase).
    z=r1*Math.sin(t*2*Math.PI)+r2*Math.sin(2*Math.PI*s).
    T1=Vector3f(-2.0*Math.PI*r1*Math.sin(2.0*Math.PI*t),.
        h,.
        r1*2.0*Math.PI*Math.cos(2.0*Math.PI*t)).
    T2=Vector3f(-r2*2.0*Math.PI*Math.sin(2.0*Math.PI*s),.
        0,.
        r2*2.0*Math.PI*Math.cos(2.0*Math.PI*s)).
    T1.cross(T2,T1).
    T1.normalize().
    # print [i,j,2*i+(angdivs+1)*2*j,x,y,z].
    main_strip.setCoordinate(2*i+(angdivs+1)*2*j,.
        Point3f(x,y,z)).
    main_strip.setNormal(2*i+(angdivs+1)*2*j,T1).
    x=r1*Math.cos(t*2*Math.PI)+r2*Math.cos(2*Math.PI*ss).
```

66,12-19 29% (python,none,Cp1252) - - - W 4/6Mb

```
File Edit Search Markers Folding View Utilities Macros Plugins Help
[Icons]
__init__.py (F:\Documents and Settings\Working Man\Desktop\CC-295\Meu_Curso\Meu_Curso\01_Codigo\A05\Helix)
y=h*(ss-phase).
z=r1*Math.sin(t*2*Math.PI)+r2*Math.sin(2*Math.PI*ss).
T1=Vector3f(-2.0*Math.PI*r1*Math.sin(2.0*Math.PI*t),.
            h,.
            r1*2.0*Math.PI*Math.cos(2.0*Math.PI*t)).
T2=Vector3f(-r2*2.0*Math.PI*Math.sin(2.0*Math.PI*ss),.
            0,.
            r2*2.0*Math.PI*Math.cos(2.0*Math.PI*ss)).
T1.cross(T2,T1).
T1.normalize().
# print[i,j,2*i+(angdivs+1)*2*j+1,x,y,z].
main_strip.setCoordinate(2*i+(angdivs+1)*2*j+1,.
                        Point3f(x,y,z)).
main_strip.setNormal(2*i+(angdivs+1)*2*j+1,T1).
s3d.setGeometry(main_strip).
.
if caps: s3d.addGeometry(caps_1).
if caps: s3d.addGeometry(caps_2).
.
m3f=rotation_y_vector(p1, p2).
66,12-19 58% (python,none,Cp1252) - - - W 4/6Mb
```



The image shows a screenshot of a Python IDE window. The title bar reads: `__init__.py (F:\Documents and Settings\Working Man\Desktop\CC-295\Meu_Curso\Meu_Curso\01_Codigo\A05\Helix)`. The code in the editor is as follows:

```
T1.cross(T2,T1).
T1.normalize().
# print[i,j,2*i+(angdivs+1)*2*j+1,x,y,z].
main_strip.setCoordinate(2*i+(angdivs+1)*2*j+1,.
    Point3f(x,y,z)).
main_strip.setNormal(2*i+(angdivs+1)*2*j+1,T1).
s3d.setGeometry(main_strip).
.
if caps: s3d.addGeometry(caps_1).
if caps: s3d.addGeometry(caps_2).
.
m3f=rotation_y_vector(p1, p2).
t3d=Transform3D(Matrix3f(m3f),Vector3f(p1),1.0).
.
tg=TransformGroup(t3d).
.
tg.addChild(s3d).
root.addChild(tg).
return root.
```

The status bar at the bottom shows: `66,12-19 Bot` on the left and `(python,none,Cp1252) - - - W 4/6M b` on the right.

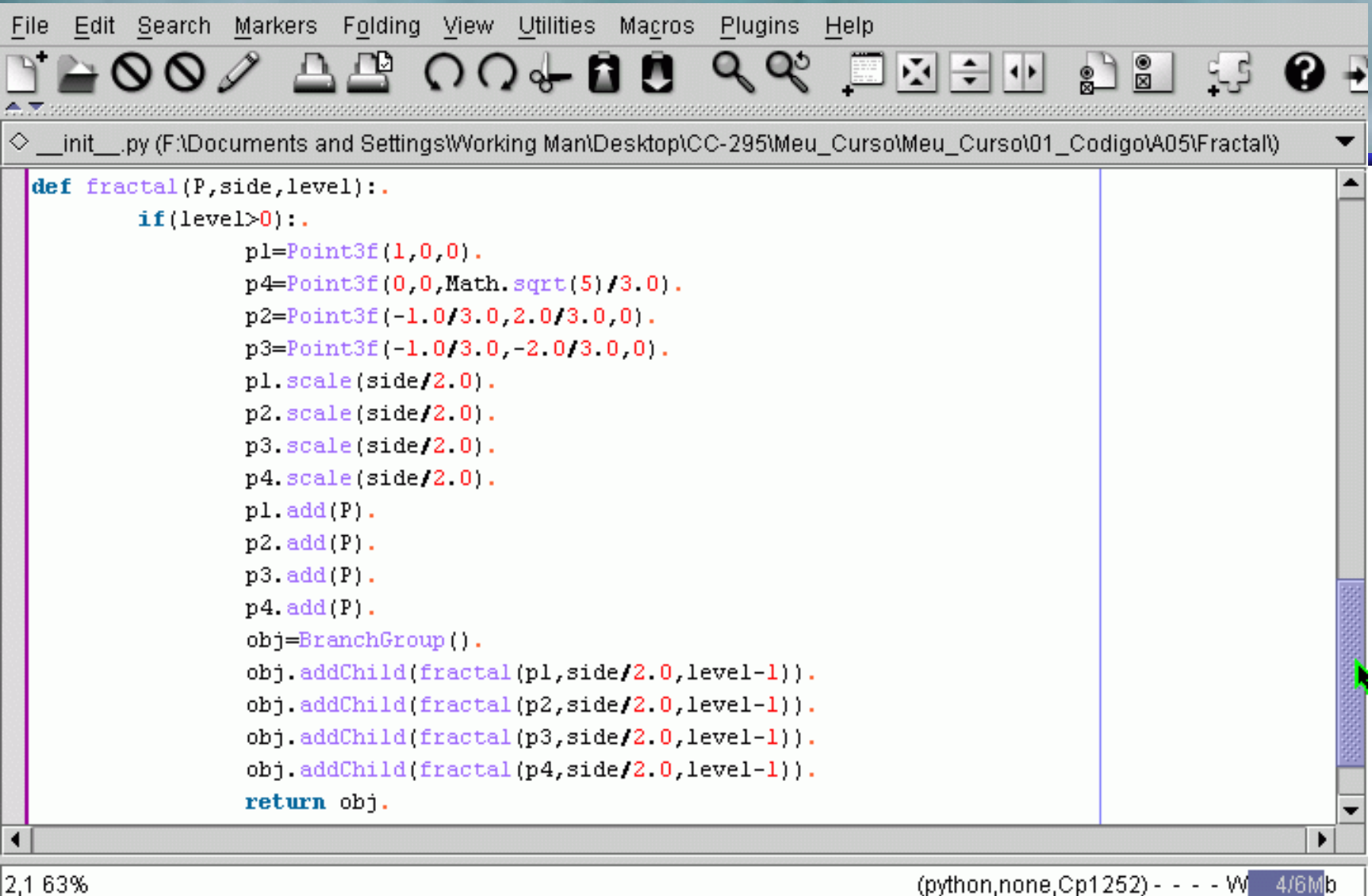
```
File Edit Search Markers Folding View Utilities Macros Plugins Help
[Icons]
◇ FractalTest.py (F:\Documents and Settings\Working Man\Desktop\CC-295\Meu_Curso\Meu_Curso\01_Codigo\A05)
from Def3d import *.
from Fractal import *.
.
def scene_graph():.
    objroot=basic_scene_graph().
    #objroot.addChild(tetraedro(Point3f(0,0,0),0.7)).
    objroot.addChild(fractal(Point3f(0,0,0),1.0,3)).
    objroot.addChild(axes_branch()).
    return objroot.
.
.
mf=MainFrame(Orbiting(scene_graph),256,256).
.
.
13,1 All (python,none,Cp1252) - - - W 4/6Mb
```



```
File Edit Search Markers Folding View Utilities Macros Plugins Help
[Icons]
__init__.py (F:\Documents and Settings\Working Man\Desktop\CC-295\Meu_Curso\Meu_Curso\01_Codigo\A05\Fractal)
from Def3d import *.
.
def tetraedro(P,side):.
    cyan=Color3f(0,1,1).
    yellow=Color3f(1,1,0).
    magenta=Color3f(1,0,1).
    green=Color3f(0,0.7,0).
    s3d=Shape3D().
    p1=Point3f(1,0,0).
    p4=Point3f(0,0,Math.sqrt(5)/3.0).
    p2=Point3f(-1.0/3.0,2.0/3.0,0).
    p3=Point3f(-1.0/3.0,-2.0/3.0,0).
    p1.scale(side).
    p2.scale(side).
    p3.scale(side).
    p4.scale(side).
    p1.add(P).
    p2.add(P).
    p3.add(P).
    p4.add(P).
```

```
File Edit Search Markers Folding View Utilities Macros Plugins Help
[Icons]
__init__.py (F:\Documents and Settings\Working Man\Desktop\CC-295\Meu_Curso\Meu_Curso\01_Codigo\A05\Fractal)
g=TriangleArray(12, TriangleArray.COORDINATES|TriangleArray.COLOR_3).
g.setCoordinate(0,p1), g.setColor(0,cyan).
g.setCoordinate(1,p3), g.setColor(1,cyan).
g.setCoordinate(2,p2), g.setColor(2,cyan).
.
g.setCoordinate(3,p2), g.setColor(3,green).
g.setCoordinate(4,p3), g.setColor(4,green).
g.setCoordinate(5,p4), g.setColor(5,green).
.
g.setCoordinate(6,p1), g.setColor(6,magenta).
g.setCoordinate(7,p2), g.setColor(7,magenta).
g.setCoordinate(8,p4), g.setColor(8,magenta).
.
g.setCoordinate(9,p1), g.setColor(9,yellow).
g.setCoordinate(10,p4), g.setColor(10,yellow).
g.setCoordinate(11,p3), g.setColor(11,yellow).
s3d.setGeometry(g).
return s3d.
.
.
```

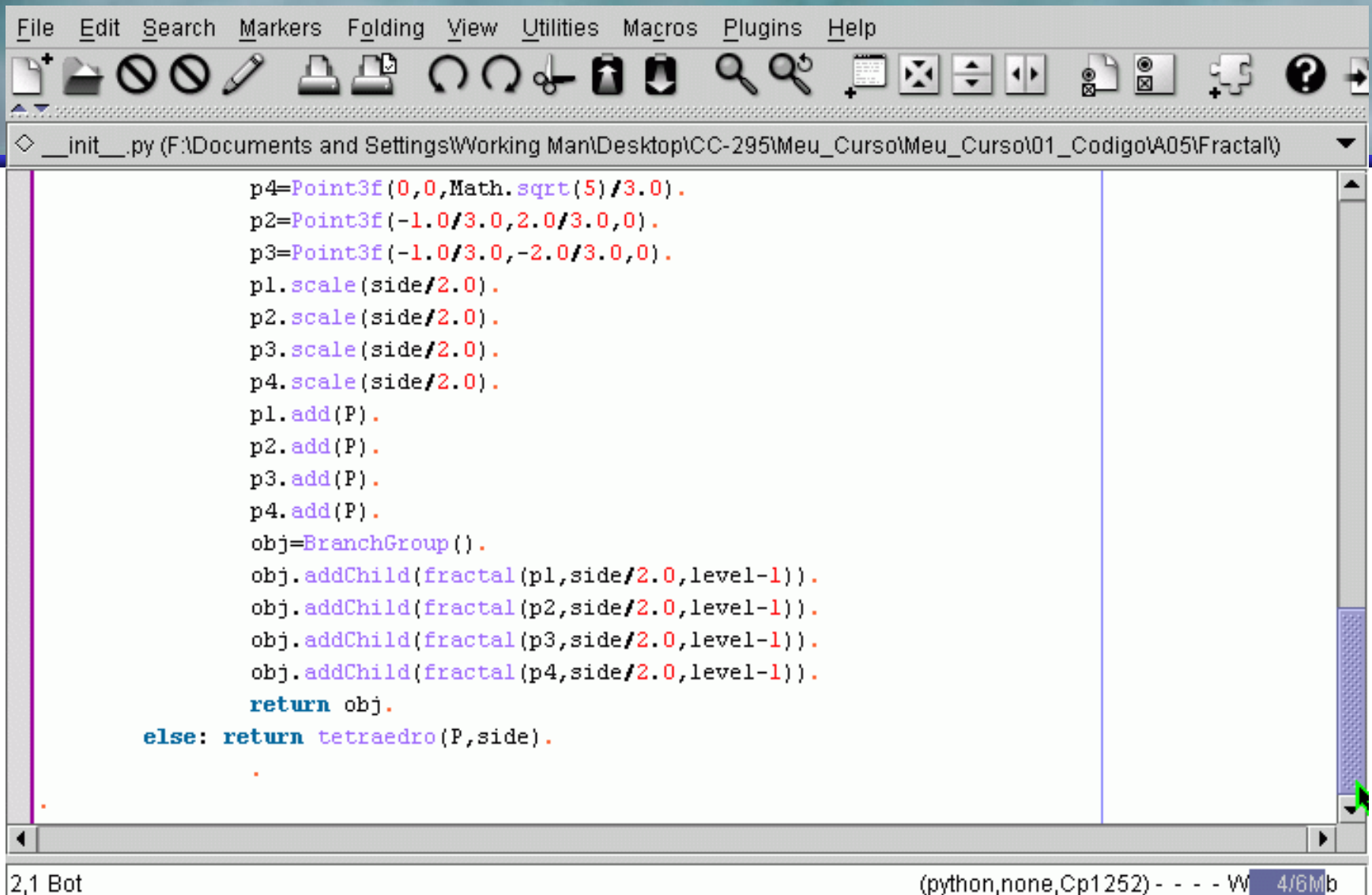
2,1 31% (python,none,Cp1252) - - - W 4/6M/b



The image shows a screenshot of a Python IDE window. The title bar reads: `__init__.py (F:\Documents and Settings\Working Man\Desktop\CC-295\Meu_Cursor\Meu_Cursor01_Codigo\A05\Fractal\)`. The main editor area contains the following Python code:

```
def fractal(P,side,level):.  
    if(level>0):.  
        p1=Point3f(1,0,0).  
        p4=Point3f(0,0,Math.sqrt(5)/3.0).  
        p2=Point3f(-1.0/3.0,2.0/3.0,0).  
        p3=Point3f(-1.0/3.0,-2.0/3.0,0).  
        p1.scale(side/2.0).  
        p2.scale(side/2.0).  
        p3.scale(side/2.0).  
        p4.scale(side/2.0).  
        p1.add(P).  
        p2.add(P).  
        p3.add(P).  
        p4.add(P).  
        obj=BranchGroup().  
        obj.addChild(fractal(p1,side/2.0,level-1)).  
        obj.addChild(fractal(p2,side/2.0,level-1)).  
        obj.addChild(fractal(p3,side/2.0,level-1)).  
        obj.addChild(fractal(p4,side/2.0,level-1)).  
    return obj.
```

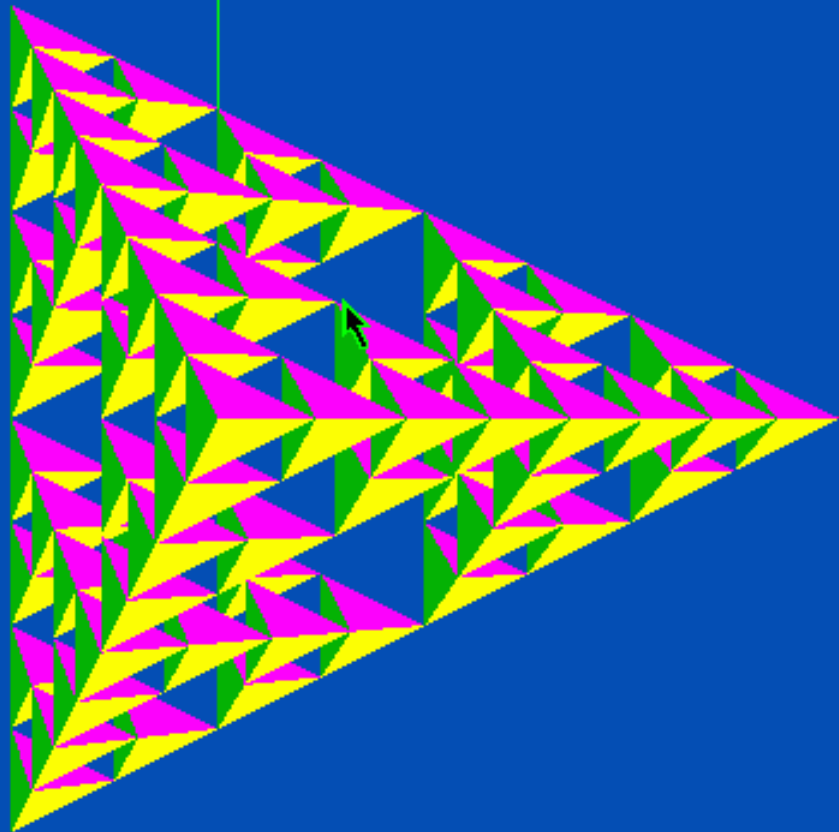
The IDE interface includes a menu bar with `File`, `Edit`, `Search`, `Markers`, `Folding`, `View`, `Utilities`, `Macros`, `Plugins`, and `Help`. Below the menu bar is a toolbar with various icons for file operations, editing, and navigation. The status bar at the bottom left shows `2,1 63%` and the bottom right shows `(python,none,Cp1252) - - - W 4/6Mb`.

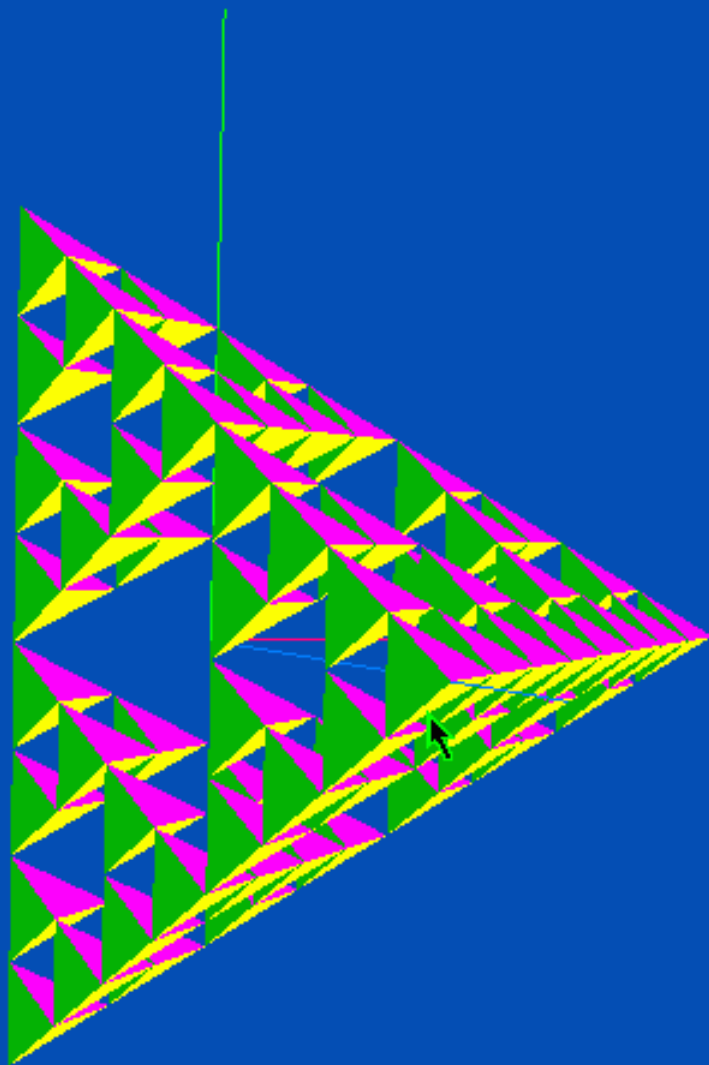


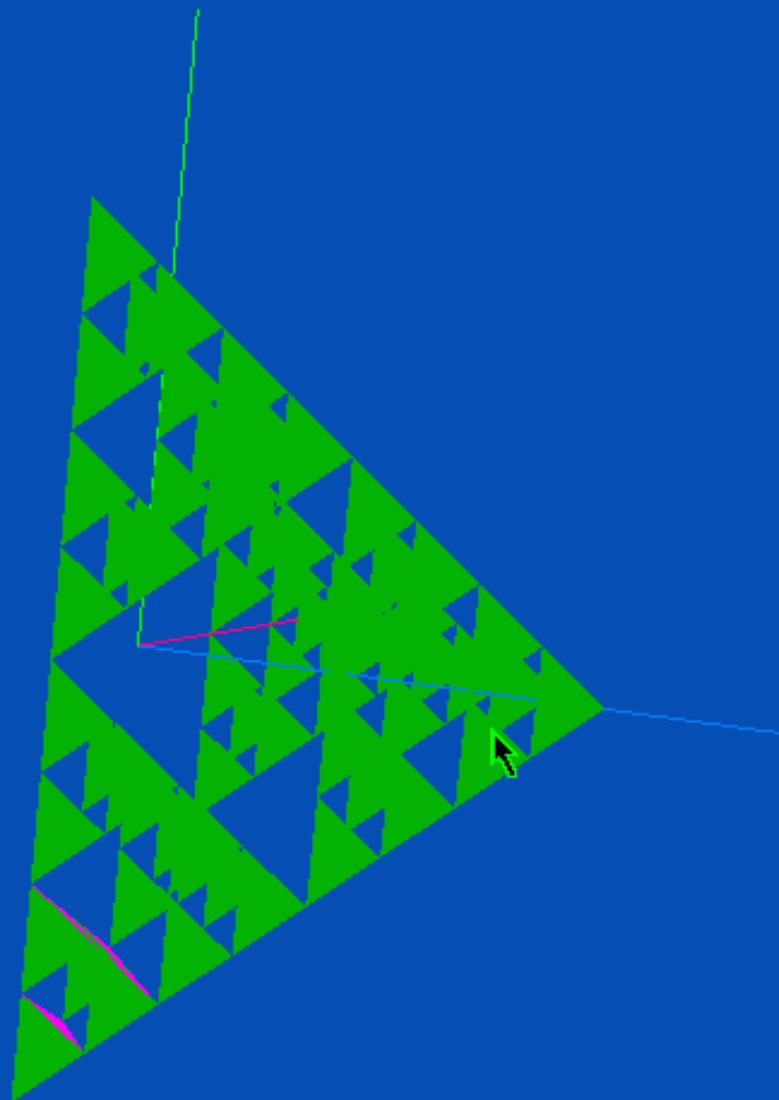
The image shows a screenshot of a Python IDE window. The title bar reads: `__init__.py (F:\Documents and Settings\Working Man\Desktop\CC-295\Meu_Cursor\Meu_Cursor\01_Codigo\A05\Fractal\)`. The code in the editor is as follows:

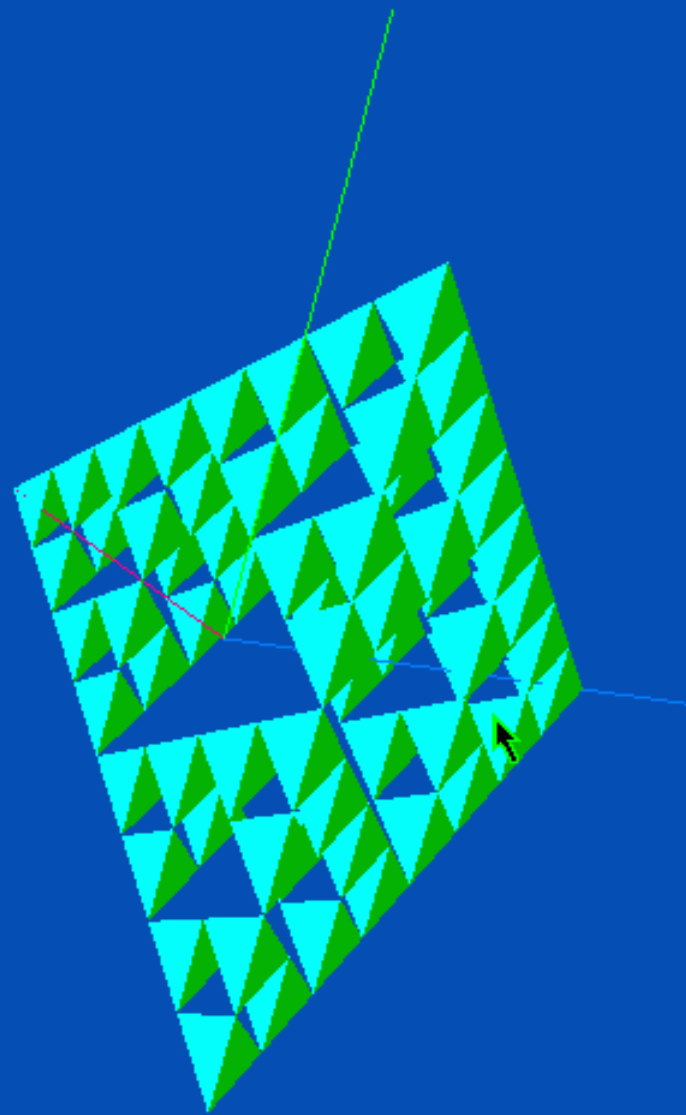
```
p4=Point3f(0,0,Math.sqrt(5)/3.0).
p2=Point3f(-1.0/3.0,2.0/3.0,0).
p3=Point3f(-1.0/3.0,-2.0/3.0,0).
p1.scale(side/2.0).
p2.scale(side/2.0).
p3.scale(side/2.0).
p4.scale(side/2.0).
p1.add(P).
p2.add(P).
p3.add(P).
p4.add(P).
obj=BranchGroup().
obj.addChild(fractal(p1,side/2.0,level-1)).
obj.addChild(fractal(p2,side/2.0,level-1)).
obj.addChild(fractal(p3,side/2.0,level-1)).
obj.addChild(fractal(p4,side/2.0,level-1)).
return obj.
else: return tetraedro(P,side).
.
```

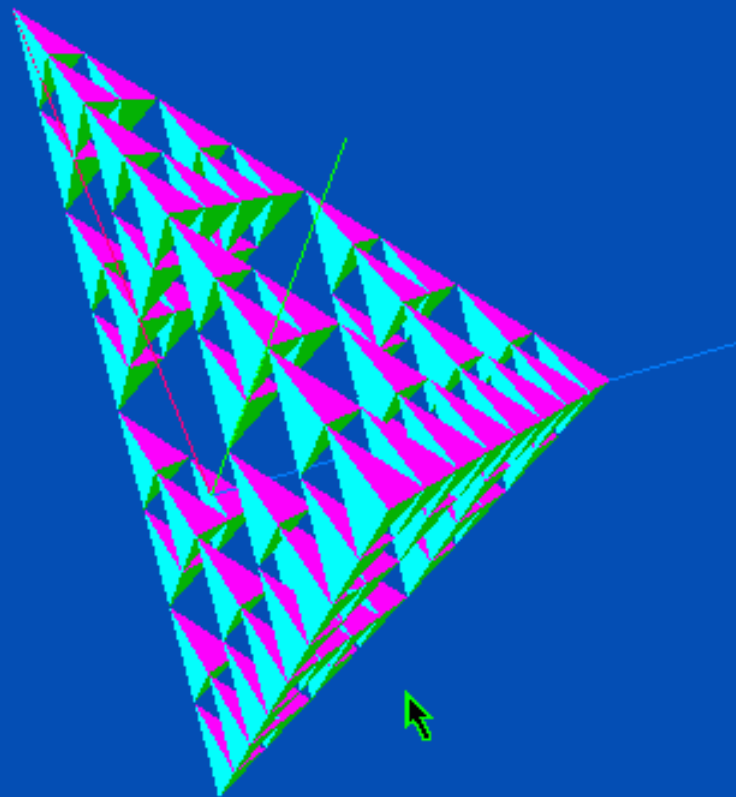
The status bar at the bottom of the window displays: `2,1 Bot` on the left and `(python,none,Cp1252) - - - W 4/6Mb` on the right.

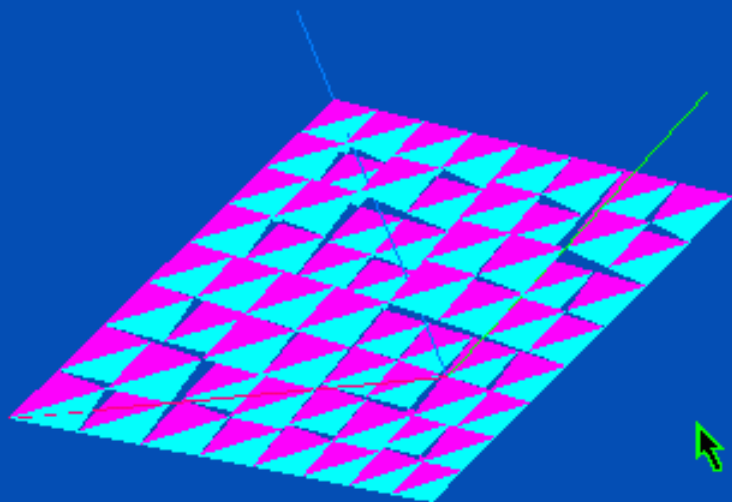


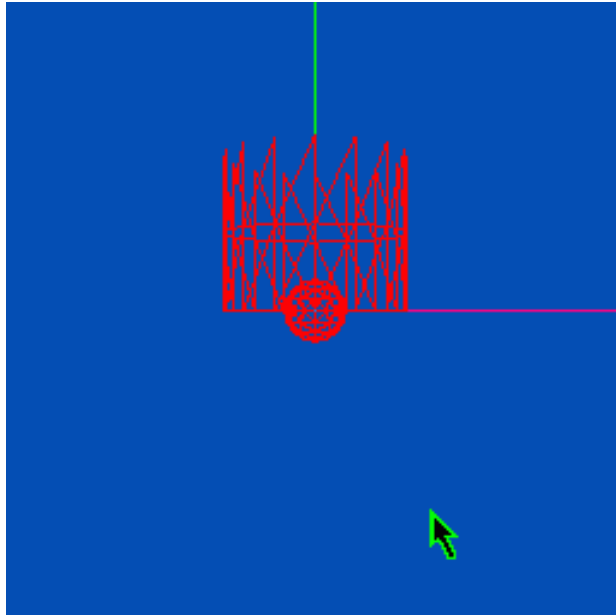


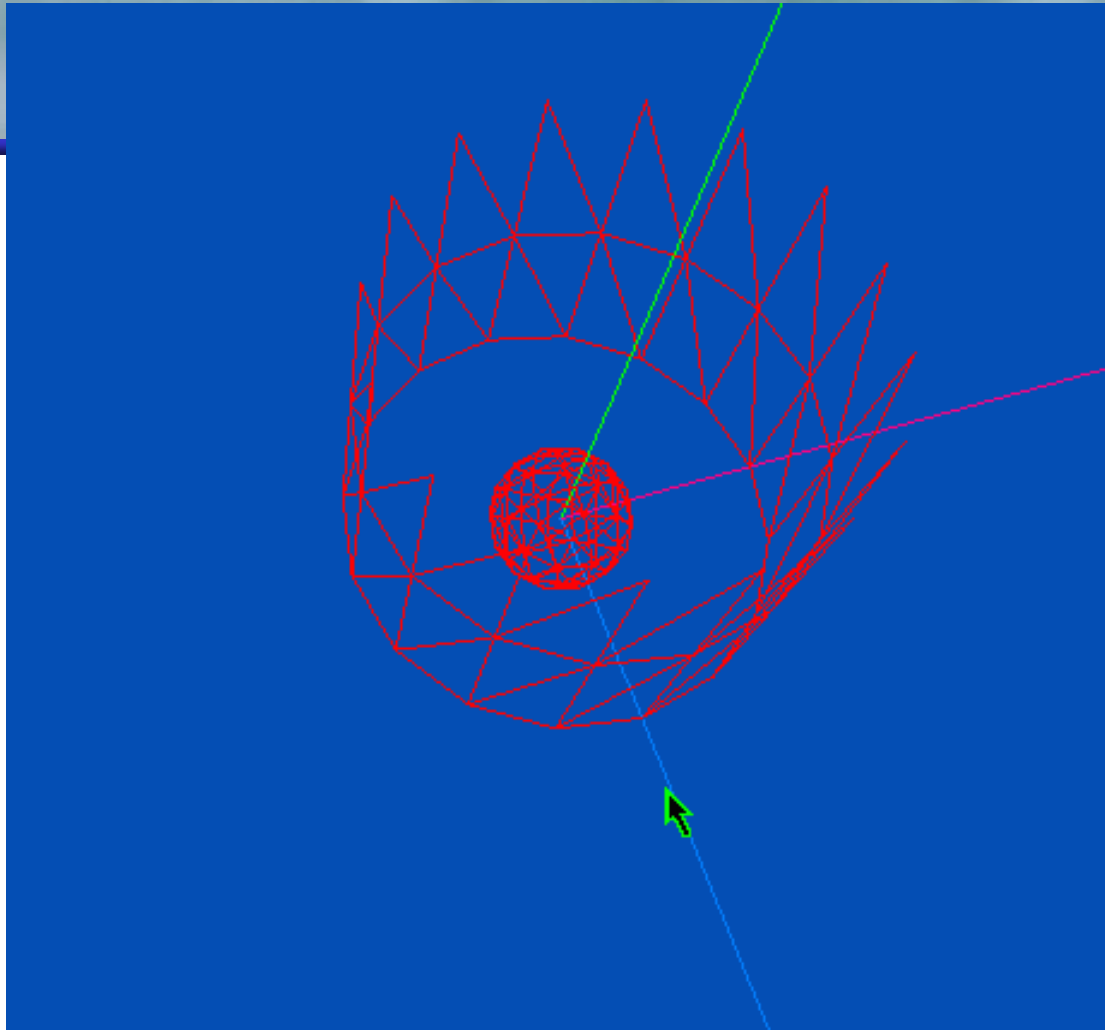






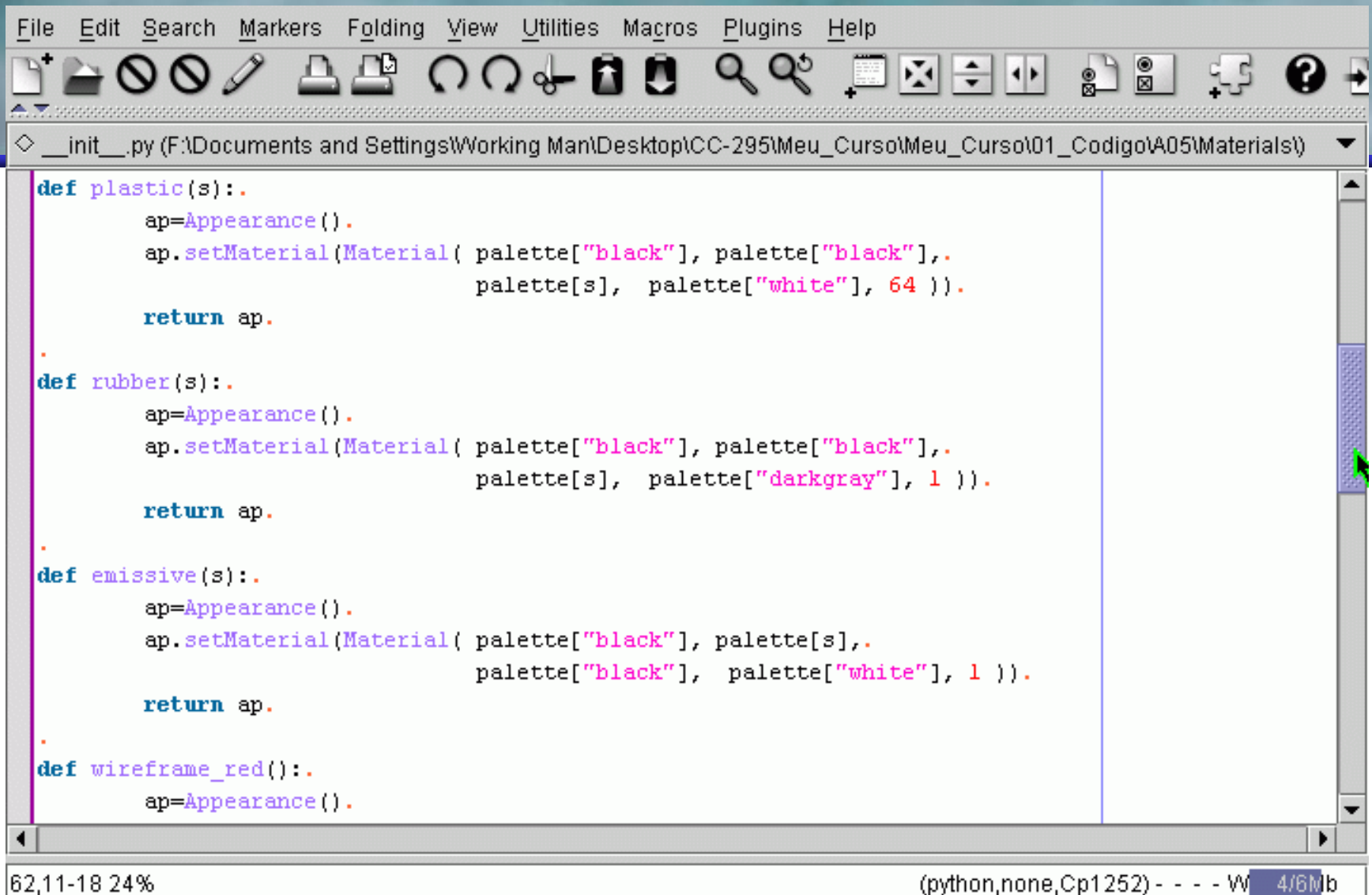






```
File Edit Search Markers Folding View Utilities Macros Plugins Help
[Icons]
__init__.py (F:\Documents and Settings\Working Man\Desktop\CC-295\Meu_Curso\Meu_Curso\01_Codigo\A05\Materials\
from Def3d import *.
.
palette={"red":Color3f(1,0,0),.
        "green":Color3f(0,1,0),.
        "blue":Color3f(0,0,1),.
        "teal":Color3f(0,0.5,1),.
        "cyan":Color3f(0,1,1),.
        "lilac":Color3f(0.5,0.5,1),.
        "magenta":Color3f(1,0,1),.
        "yellow":Color3f(1,1,0),.
        "orange":Color3f(0.5,1,0),.
        "darkgray":Color3f(0.2,0.2,0.2),.
        "gray":Color3f(0.5,0.5,0.5),.
        "brown":Color3f(0.7,0.8,0.3),.
        "beige":Color3f(1,1,0.6),.
        "white":Color3f(1,1,1),.
        "black":Color3f(0,0,0).
    }.
.
def plastic(s):.
```

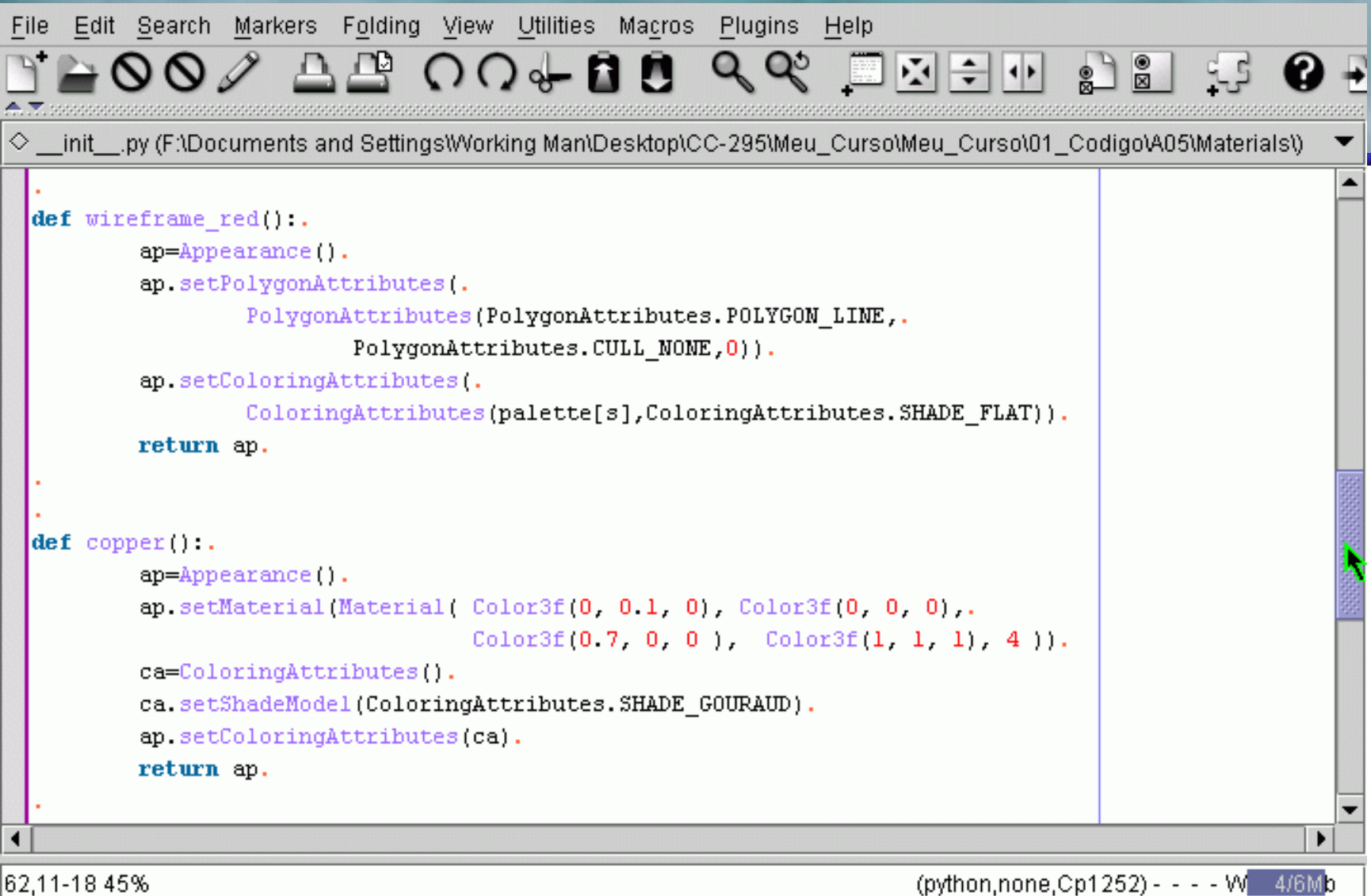
62,11-18 Top (python,none,Cp1252) - - - W 4/6M b



The image shows a screenshot of a Python IDE window. The title bar reads: `__init__.py (F:\Documents and Settings\Working Man\Desktop\CC-295\Meu_Curso\Meu_Curso\01_Codigo\A05\Materials\)`. The code in the editor is as follows:

```
def plastic(s):  
    ap=Appearance().  
    ap.setMaterial(Material( palette["black"], palette["black"],.  
                             palette[s], palette["white"], 64)).  
  
    return ap.  
.  
def rubber(s):  
    ap=Appearance().  
    ap.setMaterial(Material( palette["black"], palette["black"],.  
                             palette[s], palette["darkgray"], 1)).  
  
    return ap.  
.  
def emissive(s):  
    ap=Appearance().  
    ap.setMaterial(Material( palette["black"], palette[s],.  
                             palette["black"], palette["white"], 1)).  
  
    return ap.  
.  
def wireframe_red():  
    ap=Appearance().
```

The status bar at the bottom shows: `62,11-18 24%` on the left and `(python,none,Cp1252) - - - W 4/6M b` on the right.



The image shows a screenshot of a Python IDE window. The title bar reads: `__init__.py (F:\Documents and Settings\Working Man\Desktop\CC-295\Meu_Curso\Meu_Curso\01_Codigo\A05\Materials\)`. The menu bar includes: `File Edit Search Markers Folding View Utilities Macros Plugins Help`. The toolbar contains various icons for file operations, editing, and navigation. The main editor area contains the following Python code:

```
.
def wireframe_red():.
    ap=Appearance().
    ap.setPolygonAttributes(.
        PolygonAttributes(PolygonAttributes.POLYGON_LINE,.
            PolygonAttributes.CULL_NONE,0)).
    ap.setColoringAttributes(.
        ColoringAttributes(palette[s],ColoringAttributes.SHADE_FLAT)).
    return ap.
.
.
def copper():.
    ap=Appearance().
    ap.setMaterial(Material( Color3f(0, 0.1, 0), Color3f(0, 0, 0),.
        Color3f(0.7, 0, 0 ), Color3f(1, 1, 1), 4 )).
    ca=ColoringAttributes().
    ca.setShadeModel(ColoringAttributes.SHADE_GOURAUD).
    ap.setColoringAttributes(ca).
    return ap.
.
```

The status bar at the bottom left shows `62,11-18 45%`. The status bar at the bottom right shows `(python,none,Cp1252) - - - W 4/6Mb`.

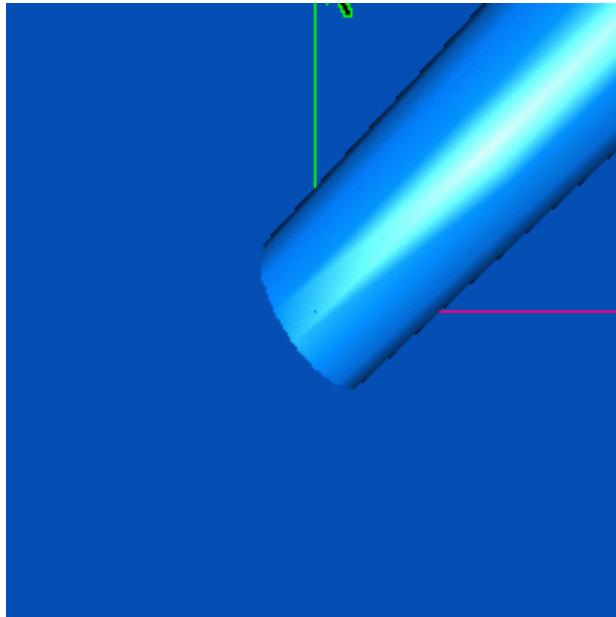
```
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[Icons]
__init__.py (F:\Documents and Settings\Working Man\Desktop\CC-295\Meu_Curso\Meu_Curso\01_Codigo\A05\Materials\
def rubber_red():.
    ap=Appearance().
    ap.setMaterial(Material( Color3f(0.2, 0, 0), Color3f(0, 0, 0),.
                           Color3f(0.6, 0, 0 ), Color3f(0.2, 0.2, 0.2), 1 )).
    return ap|.
.
def plastic_red():.
    ap=Appearance().
    ap.setMaterial(Material( Color3f(0.1, 0, 0), Color3f(0, 0, 0),.
                           Color3f(0.6, 0, 0 ), Color3f(1,1,1), 64 )).
    return ap.
.
def wireframe_red():.
    ap=Appearance().
    ap.setPolygonAttributes(.
        PolygonAttributes(PolygonAttributes.POLYGON_LINE,.
            PolygonAttributes.CULL_NONE,0)).
    ap.setColoringAttributes(.
        ColoringAttributes(1,0,0,ColoringAttributes.SHADE_FLAT)).
    return ap.
62,11-18 72% (python,none,Cp1252) - - - W 4/6Mb
```

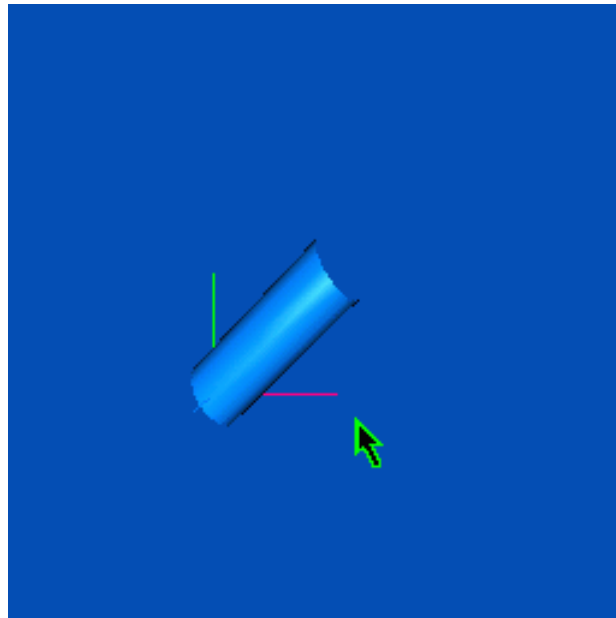


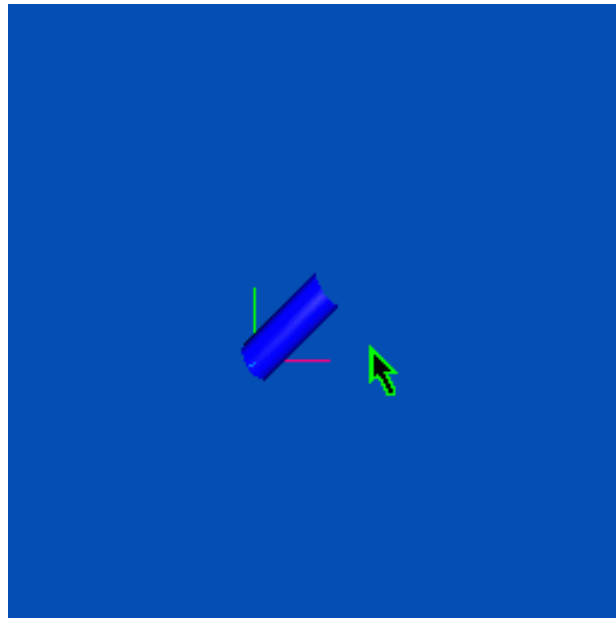
```
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[Icons]
◇ DistLod.py (F:\Documents and Settings\Working Man\Desktop\CC-295\Meu_Curso\Meu_Curso\01_Codigo\A05\)
```

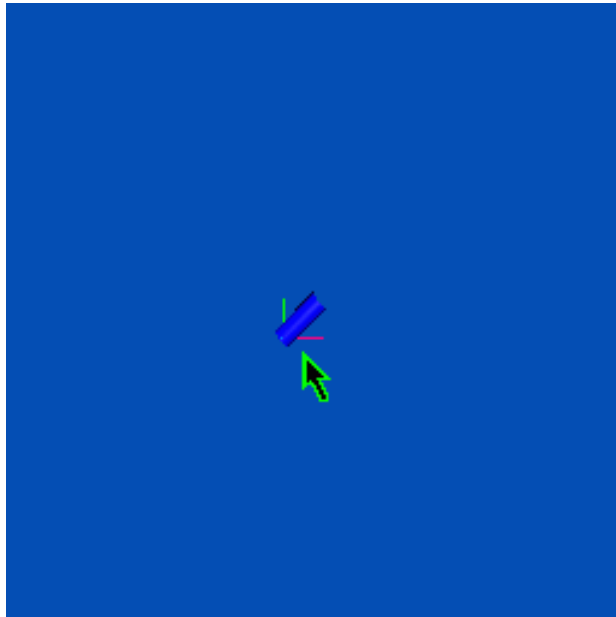
```
from Cyl import *.
.
def scene_graph():.
    objroot=basic_scene_graph().
    distlod=DistanceLOD([10.0,20.0]).
    switch=Switch(1).
    distlod.addSwitch(switch).
    distlod.setSchedulingBounds(defbounds).
    switch.addChild(cyl(Point3f(0,0,0),Point3f(1,1,1),0.3,ap=plastic("teal"))).
    switch.addChild(cyl(Point3f(0,0,0),Point3f(1,1,1),0.3,ap=plastic("blue"))).
    switch.addChild(cyl(Point3f(0,0,0),Point3f(1,1,1),0.3,ap=plastic("red"))).
    switch.setCapability(Switch.ALLOW_SWITCH_WRITE).
    objroot.addChild(switch).
    objroot.addChild(distlod).
    objroot.addChild(axes_branch()).
    objroot.addChild( Sphere(0.1,wireframe_red()) ).
    return objroot.
.
mf=MainFrame(Orbiting(scene_graph),256,256).
```

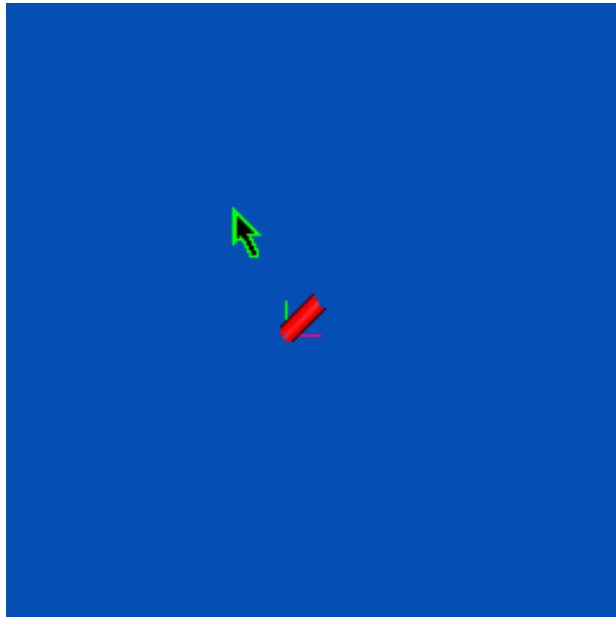
14,26-33 All Input/output complete (python,none,Cp1252) - - - W 5/6Mb

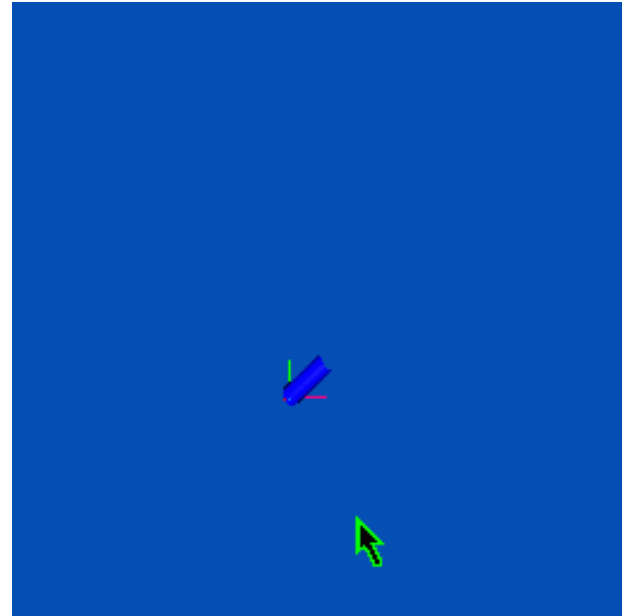
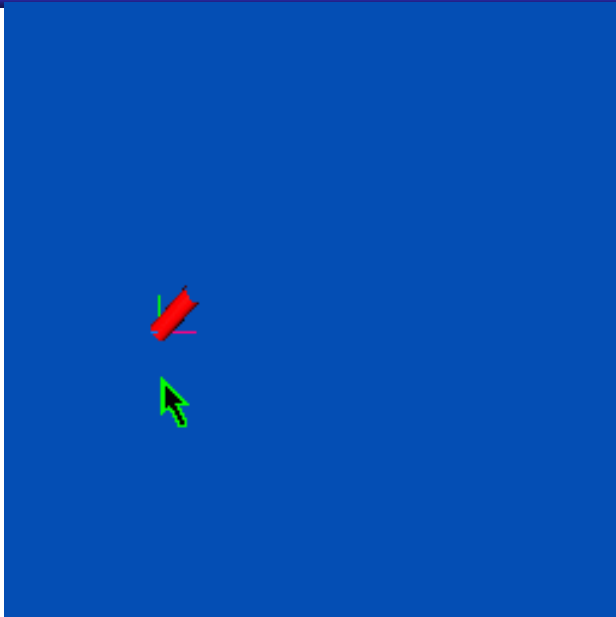




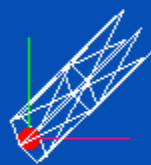


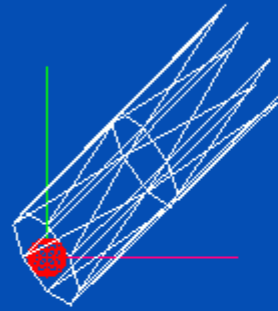


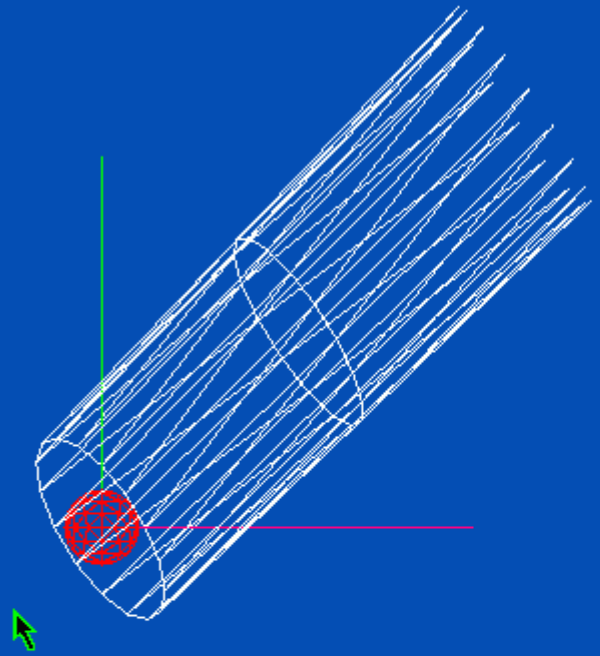












```
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[Icons]
◇ DistLod2.py (F:\Documents and Settings\Working Man\Desktop\CC-295\Meu_Curso\Meu_Curso\01_Codigo\A05\)
```

```
from Def3d import *.
from Cyl import *.
.
def scene_graph():
    objroot=basic.scene_graph().
    distlod=DistanceLOD([5.0,10.0,20.0]).
    switch=Switch(1).
    distlod.addSwitch(switch).
    distlod.setSchedulingBounds(defbounds).
    switch.addChild(cyl(Point3f(0,0,0),Point3f(1,1,1),0.3,ap=wireframe("white"),angdivs=16)).
    switch.addChild(cyl(Point3f(0,0,0),Point3f(1,1,1),0.3,ap=wireframe("white"),angdivs=8)).
    switch.addChild(cyl(Point3f(0,0,0),Point3f(1,1,1),0.3,ap=wireframe("white"),angdivs=6)).
    switch.addChild(cyl(Point3f(0,0,0),Point3f(1,1,1),0.3,ap=wireframe("white"),angdivs=3)).
    switch.setCapability(Switch.ALLOW_SWITCH_WRITE).
    objroot.addChild(switch).
    objroot.addChild(distlod).
    objroot.addChild(axes_branch()).
    objroot.addChild( Sphere(0.1,wireframe_red()) ).
    return objroot.
.
```

4,19 Top Input/output complete (python,none,Cp1252) - - - W 5/6Mb

