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contents

3.4 draw spline curve
 Fourth, draw circles and arcs
 4.1 Draw a circle
 4.2 Draw arc
 Five, draw ellipse and ellipse arc
 5.1 Draw an ellipse
 5.2 Draw an elliptical arc
 Six, entity and pattern fill
 6.1 Entity Fill
 6.2 Circular pattern fill
 6.3 Closed polyline pattern fill
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4.1 Draw a circle

4.2 Draw arc

Five, draw ellipse and ellipse arc

5.1 Draw an ellipse

5.2 Draw an elliptical arc

Six, entity and pattern fill

6.1 Entity Fill

6.2 Circular pattern fill

6.3 Closed polyline pattern fill

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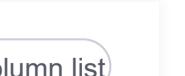


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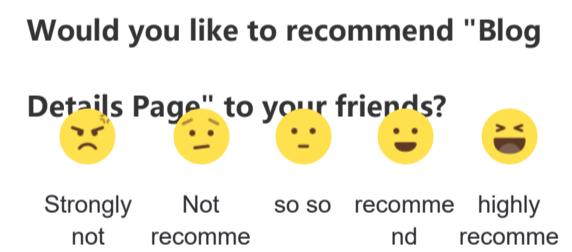
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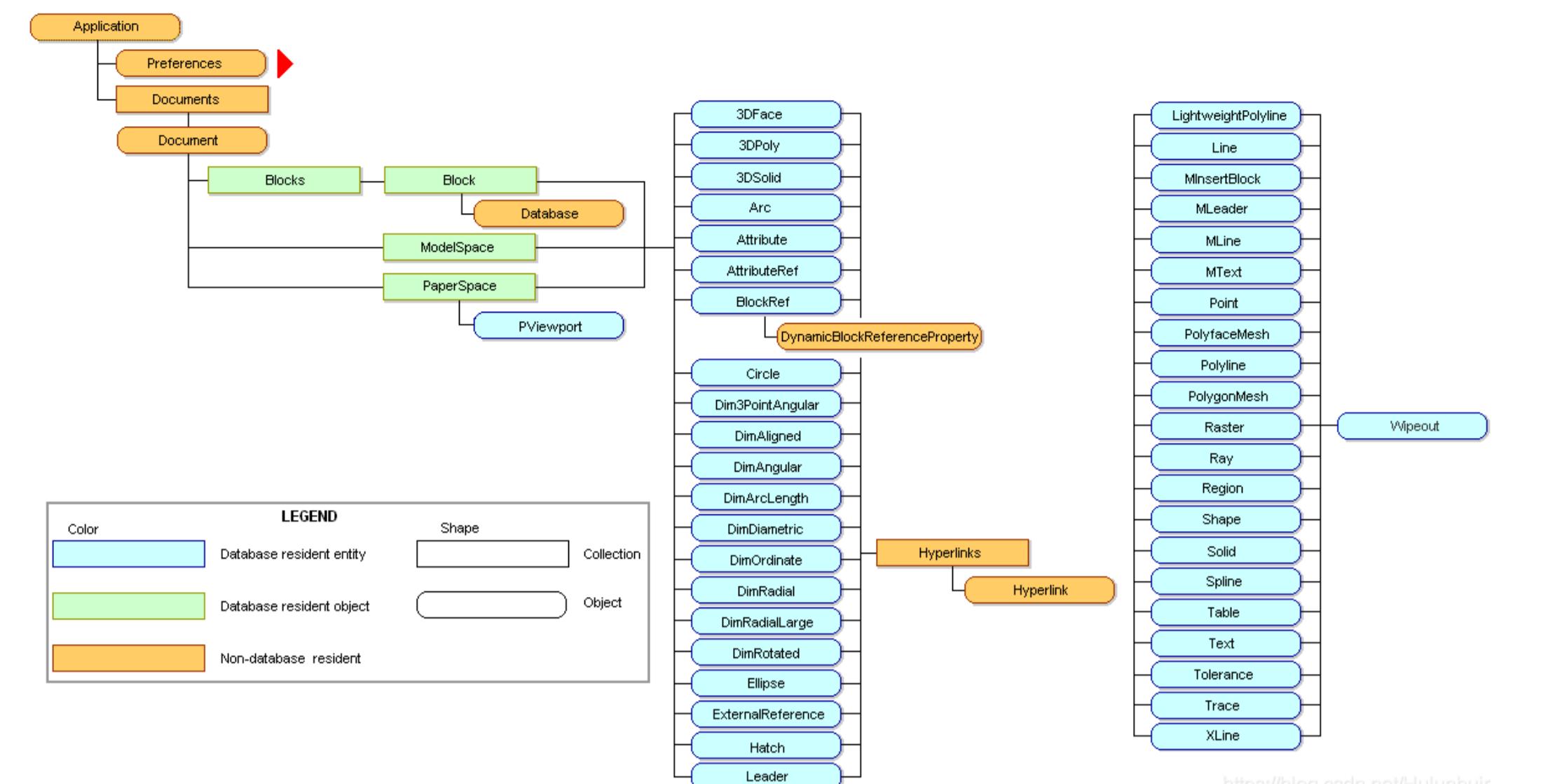
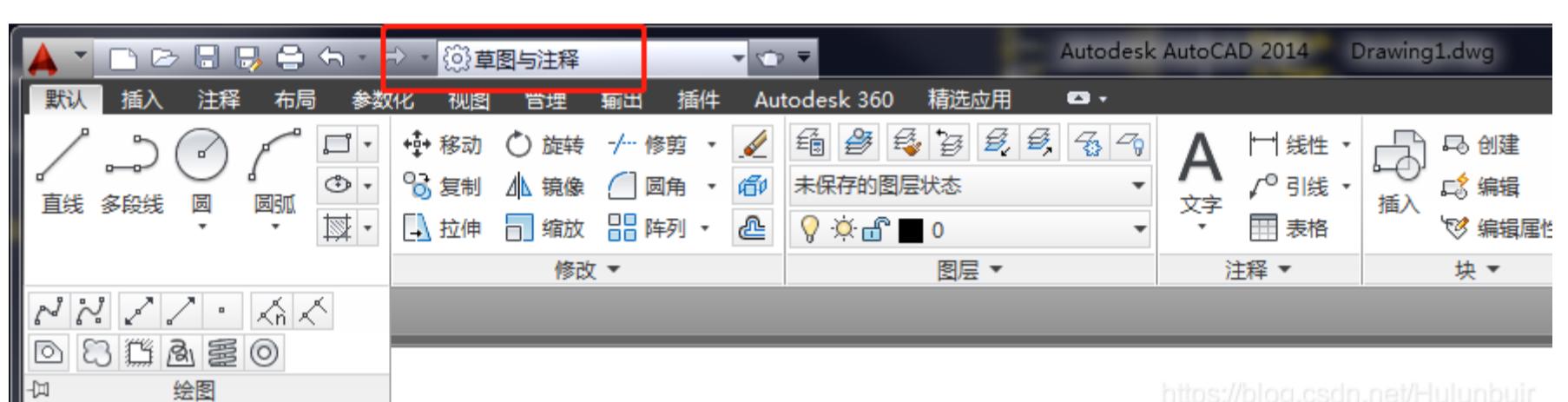
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- Fourth, draw circles and arcs
 - 4.1 Draw a circle
 - 4.2 Draw arc
- Five, draw ellipse and ellipse arc
 - 5.1 Draw an ellipse
 - 5.2 Draw an elliptical arc
- Six, entity and pattern fill
 - 6.1 Entity Fill
 - 6.2 Circular pattern fill

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AutoCAD drawing menu

本文主要采用 pyautocad 库及 pywin32 库连接 CAD, 两种连接方式如下:

• 方式一: pyautocad

```

1 #!/usr/bin/env python
2 # -*- coding: utf-8 -*-
3
4 """
5 =====
6 Author: DalNur
7 Email: liyang@alu.hit.edu.cn
8 =====
9
10 from pyautocad import Autocad, APoint, aDouble
11 import math
12
13 pyacad = Autocad(create_if_not_exists=True)
14 pyacad.prompt("Hello! Autocad from pyautocad.")
15 print(pyacad.doc.Name)
16

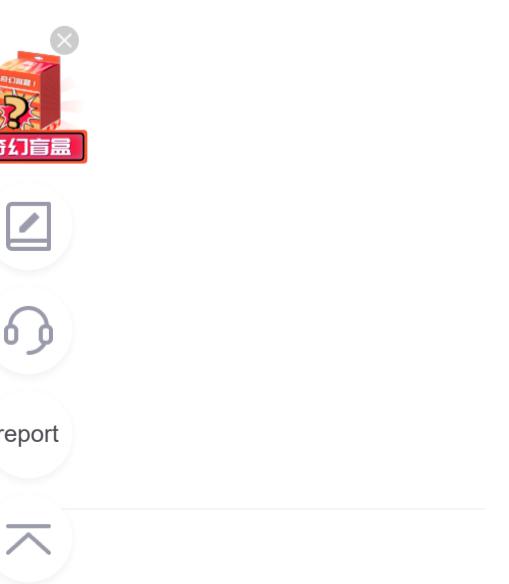
```

• 方式二: pywin32

```

1 #!/usr/bin/env python
2 # -*- coding: utf-8 -*-
3
4 """
5 =====
6 Author: DalNur
7 Email: liyang@alu.hit.edu.cn
8 =====
9
10 import pythoncom
11 import win32com.client
12 import math
13
14 wincad = win32com.client.Dispatch("AutoCAD.Application")
15 doc = wincad.ActiveDocument
16 doc.Utility.Prompt("Hello! Autocad from pywin32com.\n")
17 msp = doc.ModelSpace
18 print(doc.Name)
19

```



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- Fourth, draw circles and arcs
 - 4.1 Draw a circle
 - 4.2 Draw arc
- Five, draw ellipse and ellipse arc
 - 5.1 Draw an ellipse
 - 5.2 Draw an elliptical arc
- Six, entity and pattern fill
 - 6.1 Entity Fill
 - 6.2 Circular pattern fill
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```

3
4
5 def vtobj(obj):
6     return win32com.client.VARIANT(pythoncom.VT_ARRAY | pythoncom.VT_DISPATCH, obj)
7
8
9 def vtfloat(lst):
10    return win32com.client.VARIANT(pythoncom.VT_ARRAY | pythoncom.VT_R8, lst)

```

二、创建点及直线

1. 设置点显示

```

1 pyacad.ActiveDocument.SetVariable("PDMODE", 35) # 设置点样式的显示方式
2 pyacad.ActiveDocument.SetVariable("PDSIZE", 2) # 设置点大小

```

2. pyautocad绘直线

```

1 startPoint = APoint(5, 8) # z坐标可空缺, 空缺时系统默认其为0, 即点Pnt1在CAD中坐标为 (5,25,0)。
2 endPoint = APoint(20, 15) # pyautocad自动将各坐标转化为双精度浮点数。
3 lineObj = pyacad.model.AddLine(startPoint, endPoint)

```

3. pywin32绘制点

```

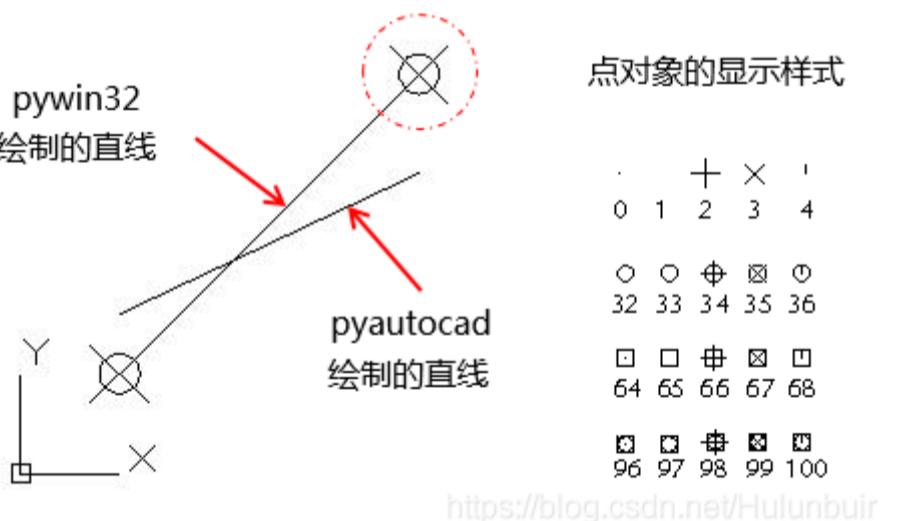
1 startPntCoords = vtpt(5, 5)
2 startPoint = msp.AddPoint(startPntCoords)
3
4 endPntCoords = vtpt(20, 20)
5 endPoint = msp.AddPoint(endPntCoords)

```

4. pywin32绘直线

```
1 lineObj = msp.AddLine(startPntCoords, endPntCoords)
```

以上代码运行后, 效果如下图所示:



三、绘制多段线及样条曲线

3.1 绘制普通多段线

1. pyautocad绘多段线

```

1 # 创建图元
2 pnts = [APoint(5, 5), APoint(10, 5), APoint(20, 20), APoint(25, 20)]
3 pnts = [j for i in pnts for j in i] # 将各点坐标顺序变换为1行多列的1维数组。
4 pnts = aDouble(pnts) # 数据类型转化为双精度浮点数
5 plineObj = pyacad.model.AddPolyLine(pnts)
6
7
8 # 指定颜色
9 clr = pyacad.Application.GetInterfaceObject("AutoCAD.AcColor.19")
10 clr.SetRGB(0, 0, 255) # 创建蓝色
11 plineObj.TrueColor = clr # 指定颜色
12
13
14 # 设置线宽
15 segmentIndex = 2 # 多段线的段号, 从0起计数。

```



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- Fourth, draw circles and arcs

4.1 Draw a circle

4.2 Draw arc

Five, draw ellipse and ellipse arc

5.1 Draw an ellipse

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```

21 pyacad.ActiveDocument.preferences.LineWeightDisplay = 1 # 显示线宽
22
23
24 pyacad.ActiveDocument.Application.ZoomAll()
25 pyacad.ActiveDocument.Application.Update()

```

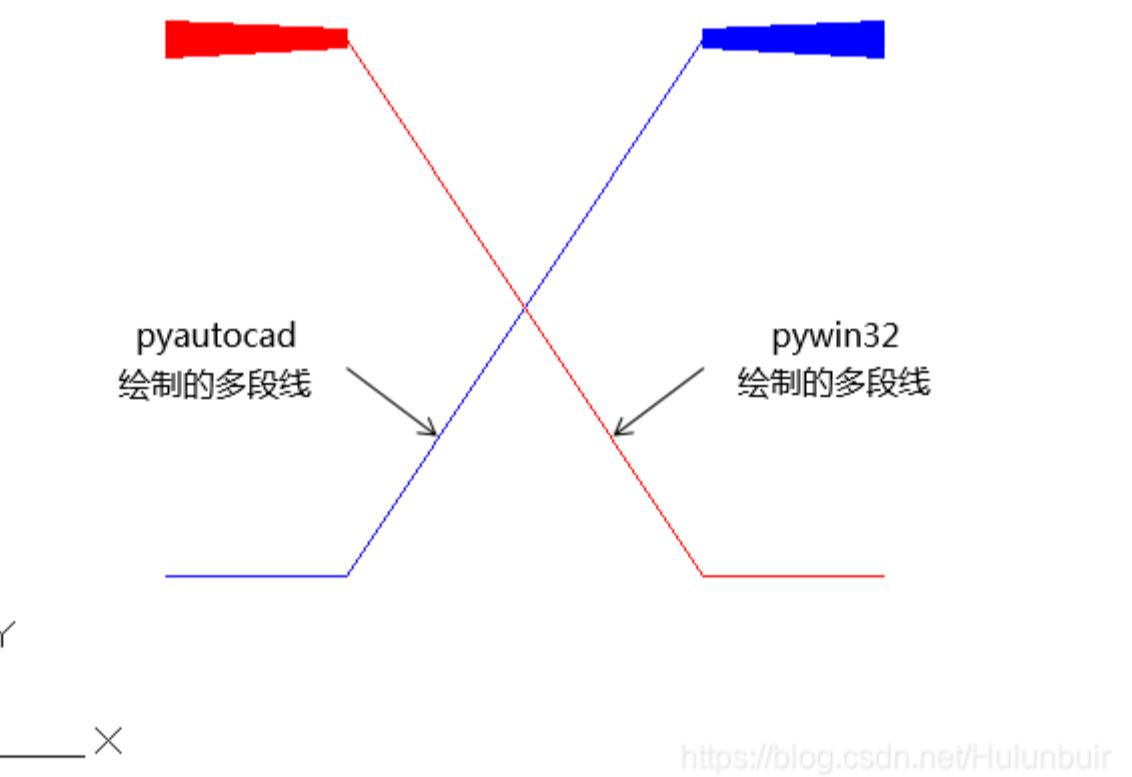
2. pywin32绘多段线

```

1 # 创建图元
2 pnts = [5, 20, 0, 10, 20, 0, 20, 5, 0, 25, 5, 0]
3 points = vtfloat(pnts)
4 plineObj = msp.AddPolyline(points)
5
6
7 # 指定颜色
8 clr = doc.Application.GetInterfaceObject("AutoCAD.ACCmColor.19")
9 clr.SetRGB(255, 0, 0) # 创建红色
10 plineObj.TrueColor = clr # 指定颜色
11
12
13 # 设置线宽
14 segmentIndex = 0 # 多段线的段号, 从0起计数。
15 startWidth = 1.0 # 段起点处线宽
16 endWidth = 0.5 # 段终点处线宽
17 plineObj.SetWidth(segmentIndex, startWidth, endWidth) # 为多段线plineObj的第一段设置变宽度线宽
18
19
20 doc.preferences.LineWeightDisplay = 1 # 显示线宽
21
22
23 doc.Application.ZoomAll()
24 doc.Application.Update()

```

以上代码运行后, 效果如下图所示:



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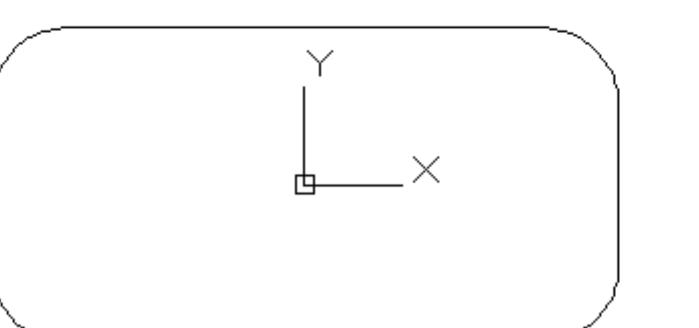
3.2 绘制含圆弧多段线

详见博客: Python 二次开发 AutoCAD 简介 >> 七、绘图 >> 7.1 倒角矩形。

```

27 pnts = [j for i in pnts for j in i] # 将点的坐标顺序变换为行数据
28 pnts = aDouble(pnts) # 转化为双精度浮点数
29
30 plineObj = pyacad.model.AddPolyLine(pnts)
31 plineObj.Closed = True # 闭合多段线
32 bulgeValue = math.tan(math.pi / 8) # 凸度, 为四分之一倍圆弧所对圆心角的正切值。
33
34 [plineObj.SetBulge(2 * i, bulgeValue) for i in range(4)]
35 # 将多段线的第1、3、5、7部分设置为凸度为bulgevalue的圆弧。

```



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contents

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Fourth, draw circles and arcs

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4.2 Draw arc

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5.2 Draw an elliptical arc

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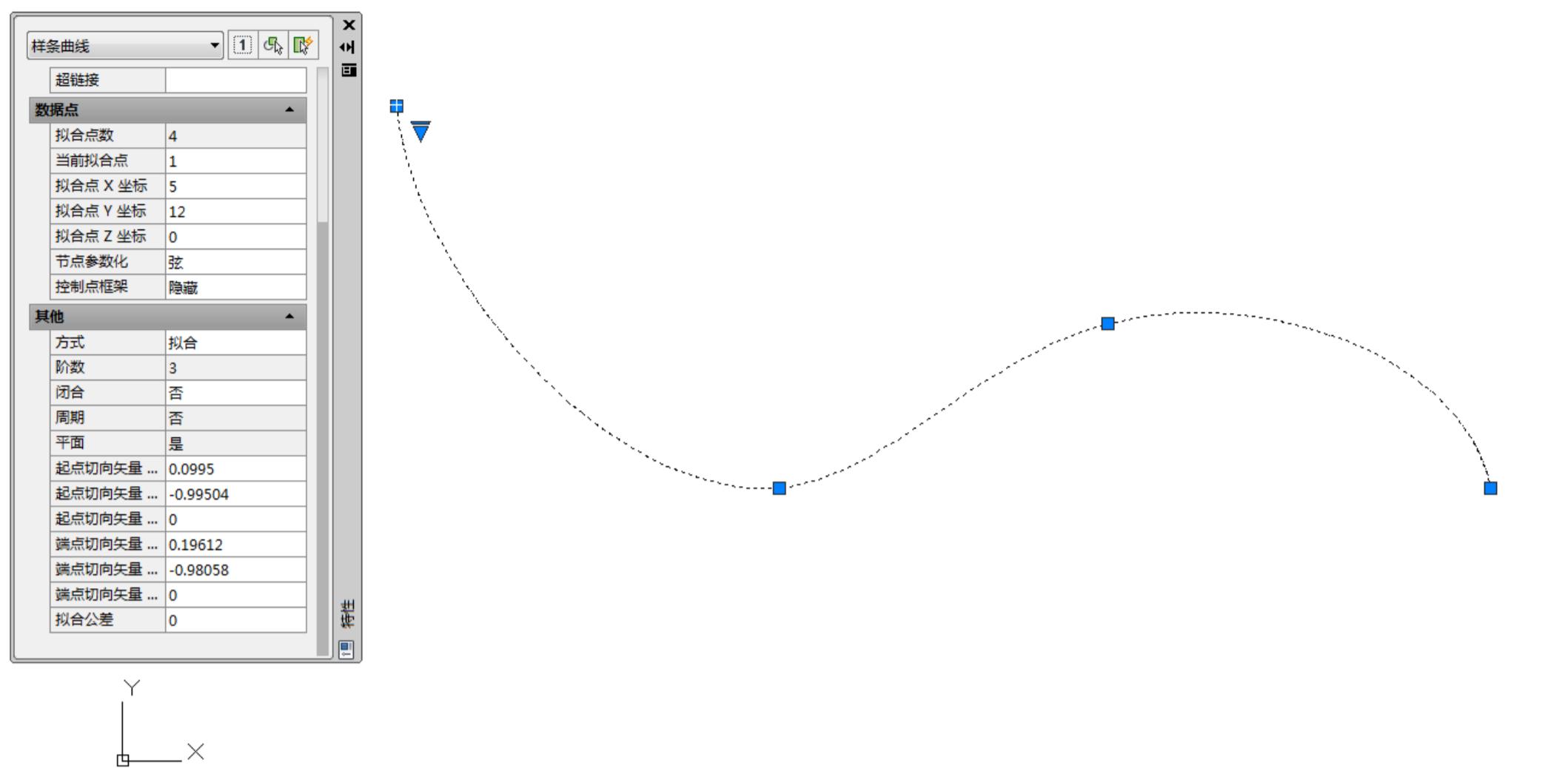
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```

3 splinePnts = aDouble(splinePnts)
4 startTan = APoint(1, -10) # startTan为样条曲线起点处切线的方向向量。
5 endTan = APoint(1, -5) # endTan为样条曲线终点处切线的方向向量。
6 SplineObj = pyacad.model.AddSpline(splinePnts, startTan, endTan)

```

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```
RetVal = object.AddSpline(PointsArray, StartTangent, EndTangent)
```

Object

PointsArray

StartTangent

EndTangent

RetVal

<https://blog.csdn.net/hulunbuir>

四、绘制圆及圆弧

4.1 绘制圆

1. pyautocad

```

1 # 创建图元
2 center = APoint(5, 5) # 圆心
3 radius = 4 # 半径
4 circleObj = pyacad.model.AddCircle(center, radius)
5
6 # 指定颜色
7 clr = pyacad.Application.GetInterfaceObject("AutoCAD.AcCmColor.19")
8 clr.SetRGB(0, 0, 255) # 创建蓝色
9 circleObj.TrueColor = clr # 指定颜色

```

2. pywin32

```

1 center, radius = vtpnt(5, 5, 0), 2
2 circleObj = msp.AddCircle(center, radius)
3
4 # 指定颜色
5 clr = doc.Application.GetInterfaceObject("AutoCAD.AcCmColor.19")
6 clr.SetRGB(255, 0, 0) # 创建红色
7 circleObj.TrueColor = clr # 指定颜色

```

以上代码运行后, 效果如下图所示:



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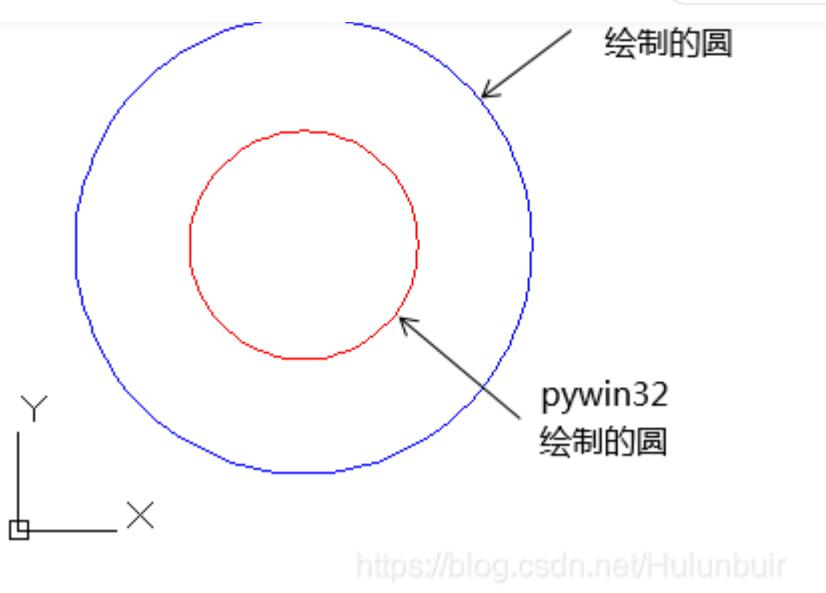
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- 3.4 draw spline curve
- Fourth, draw circles and arcs
 - 4.1 Draw a circle
 - 4.2 Draw arc
- Five, draw ellipse and ellipse arc
 - 5.1 Draw an ellipse
 - 5.2 Draw an elliptical arc
- Six, entity and pattern fill
 - 6.1 Entity Fill
 - 6.2 Circular pattern fill

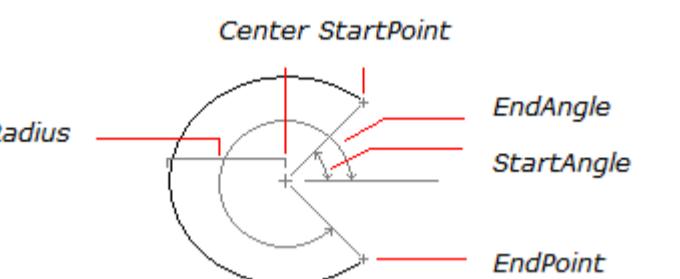
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4.2 绘制圆弧

An arc is always drawn counterclockwise from the start point to the endpoint. The StartPoint and EndPoint properties of an arc are calculated through the **StartAngle**, **EndAngle**, and **Radius** properties.



1. pyautocad

```

1 # 创建图元
2 center = APoint(5, 5) # 圆心
3 radius = 4 # 半径
4 startAngle = math.radians(-60) # 始边角度 (弧度制)
5 endAngle = math.radians(60) # 终边角度 (弧度制)
6 arcObj = pyacad.model.AddArc(center, radius, math.radians(-60), math.radians(60))
7
8 # 指定颜色
9 clr = pyacad.Application.GetInterfaceObject("AutoCAD.AcCmColor.19")
10 clr.SetRGB(0, 0, 255) # 创建蓝色
11 arcObj.TrueColor = clr # 指定颜色

```

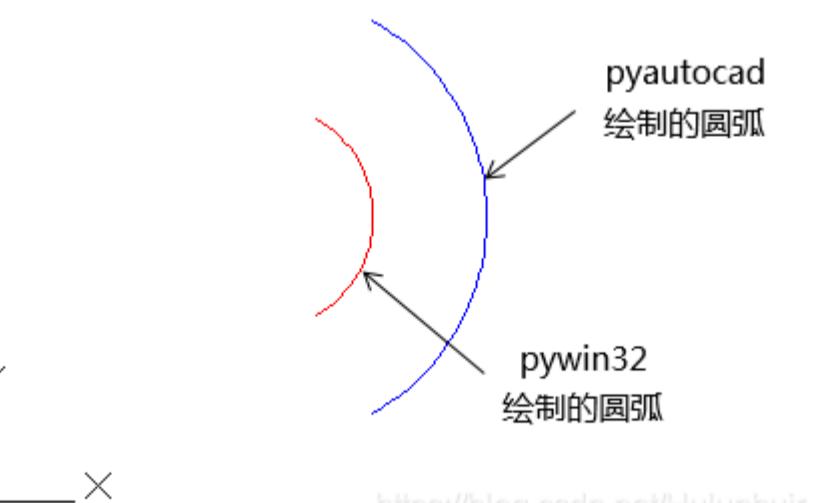
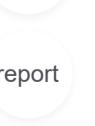
2. pywin32

```

1 # 创建图元
2 center, radius = vtpt(5, 5, 0), 2
3 startAngle = math.radians(-60) # 始边角度 (弧度制)
4 endAngle = math.radians(60) # 终边角度 (弧度制)
5 arcObj = msp.AddArc(center, radius, math.radians(-60), math.radians(60))
6
7 # 指定颜色
8 clr = doc.Application.GetInterfaceObject("AutoCAD.AcCmColor.19")
9 clr.SetRGB(255, 0, 0) # 创建红色
10 arcObj.TrueColor = clr # 指定颜色

```

以上代码运行后, 效果如下图所示:

<https://blog.csdn.net/hulunbuir>

五、绘制椭圆及椭圆弧

5.1 绘制椭圆

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contents

3.4 draw spline curve

Fourth, draw circles and arcs

4.1 Draw a circle

4.2 Draw arc

Five, draw ellipse and ellipse arc

5.1 Draw an ellipse

5.2 Draw an elliptical arc

Six, entity and pattern fill

6.1 Entity Fill

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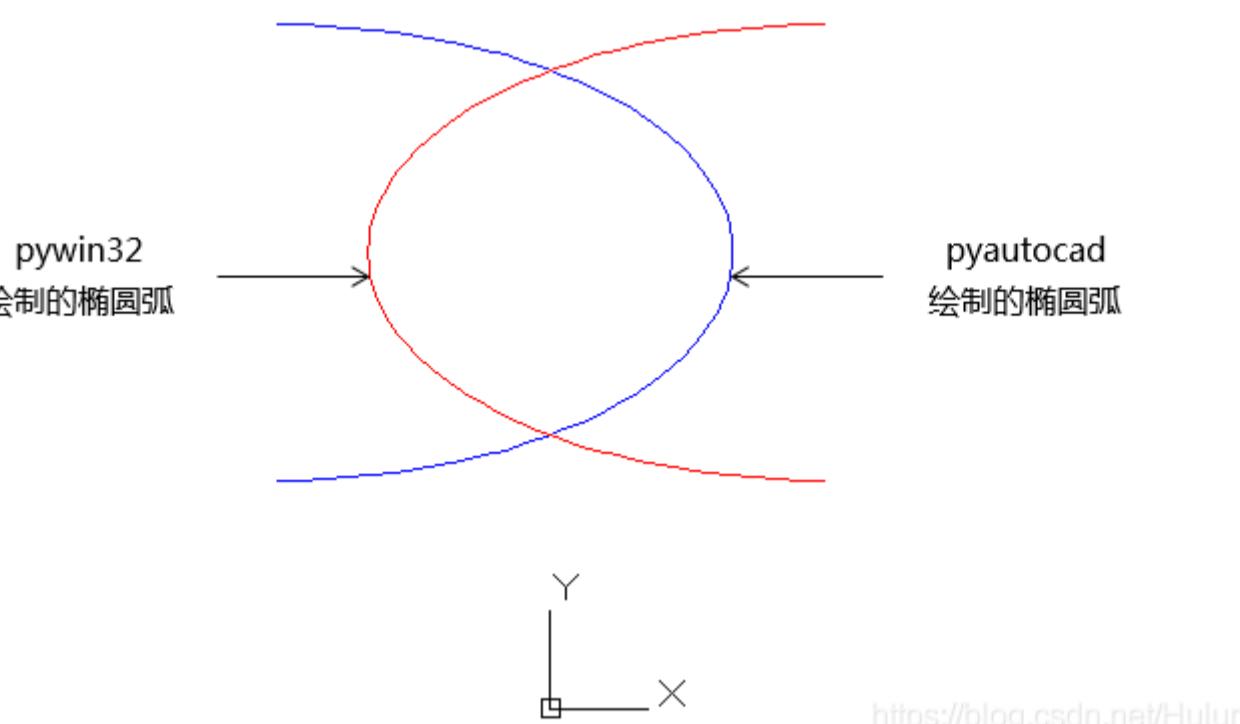
- N012 the end 507 867 2000
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```

3 majAxis = vtpt(5, 0, 0) # majAxis为主轴(长轴) 端点相对于椭圆中心的坐标增量。
4 radRatio = 0.5 # 短长轴之比为0.5
5 ellObj = msp.AddEllipse(center, majAxis, radRatio)
6 ellObj.startAngle = 90 * (3.14 / 180)
7 ellObj.endAngle = -90 * (3.14 / 180)
8
9 # 指定颜色
10 clr = doc.Application.GetInterfaceObject("AutoCAD.AcCmColor.19")
11 clr.SetRGB(255, 0, 0) # 创建红色
12 ellObj.TrueColor = clr # 指定颜色

```

以上代码运行后, 效果如下图所示:

<https://blog.csdn.net/Hulunbuir>

六、实体及图案填充

6.1 实体填充

1. pyautocad

```

1 # 创建图元
2 pnt1, pnt2, pnt3, pnt4 = APoint(-10, 5, 0), APoint(-10, 10, 0), APoint(-3, 5, 0), APoint(-3, 10, 0)
3 solidObj = pyacad.model.AddSolid(pnt1, pnt2, pnt3, pnt4)
4
5 # 指定颜色
6 clr = pyacad.Application.GetInterfaceObject("AutoCAD.AcCmColor.19")
7 clr.SetRGB(0, 0, 255) # 创建蓝色
8 solidObj.TrueColor = clr # 指定颜色

```

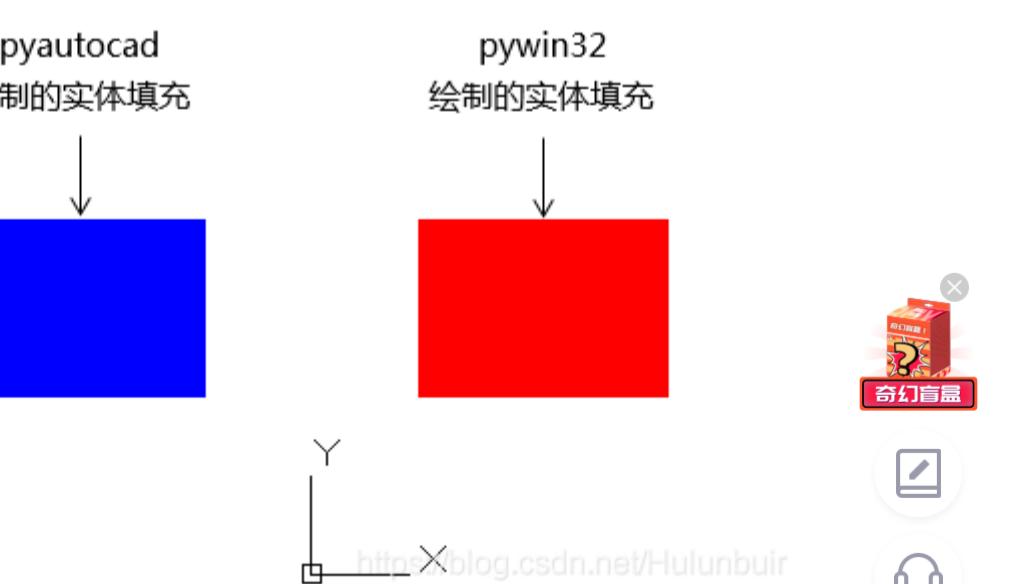
2. pywin32

```

1 # 创建图元
2 pnt1, pnt2, pnt3, pnt4 = vtpt(3, 5, 0), vtpt(3, 10, 0), vtpt(10, 5, 0), vtpt(10, 10, 0)
3 solidObj = msp.AddSolid(pnt1, pnt2, pnt3, pnt4)
4
5 # 指定颜色
6 clr = doc.Application.GetInterfaceObject("AutoCAD.AcCmColor.19")
7 clr.SetRGB(255, 0, 0) # 创建红色
8 solidObj.TrueColor = clr # 指定颜色

```

以上代码运行后, 效果如下图所示:

<https://blog.csdn.net/Hulunbuir>

6.2 圆形图案填充

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3.4 draw spline curve

Fourth, draw circles and arcs

4.1 Draw a circle

4.2 Draw arc

Five, draw ellipse and ellipse arc

5.1 Draw an ellipse

5.2 Draw an elliptical arc

Six, entity and pattern fill

6.1 Entity Fill

6.2 Circular pattern fill
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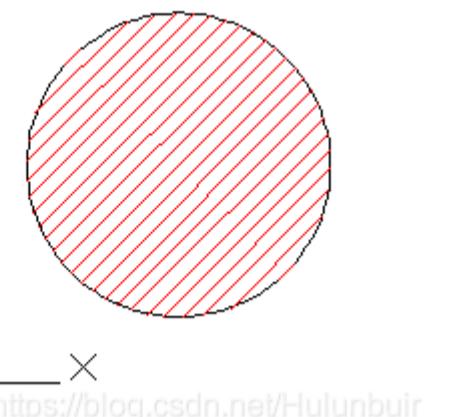
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```

3 circleObj = msp.AddCircle(center, radius)
4 outerLoop.append(circleObj)
5 outerLoop = vtobj(outerLoop)
6 hatchObj = msp.AddHatch(ptnType, ptnName, bAss)
7 hatchObj.AppendOuterLoop(outerLoop)
8 hatchObj.Evaluate() # 进行填充计算, 使图案吻合于边界
9 hatchObj.PatternScale = 0.2 # 设置填充图案比例

```

以上代码运行后, 效果如下图所示:

<https://blog.csdn.net/Hulunbuir>

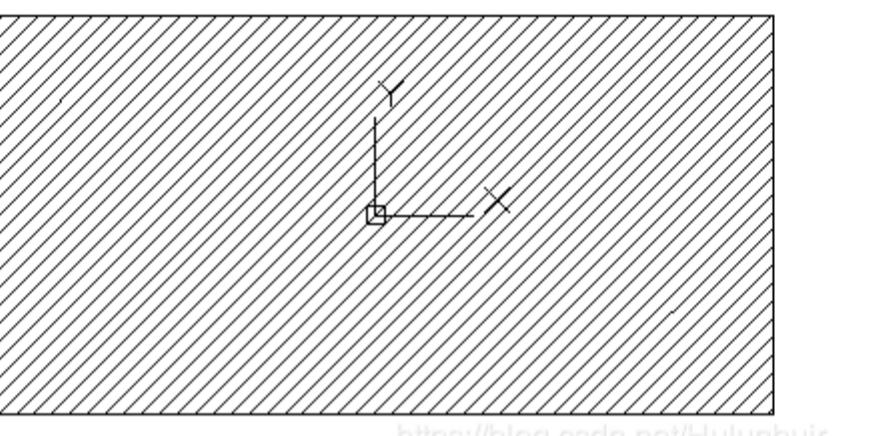
6.3 闭合多段线图案填充

详见博客: Python 二次开发 AutoCAD 简介 >> 七、绘图 >> 7.2 闭合多段线图案填充。

```

34 outerLoop = []
35 outerLoop.append(plineObj)
36 outerLoop = vtobj(outerLoop)
37 hatchObj = msp.AddHatch(ptnType, ptnName, bAss)
38 hatchObj.AppendOuterLoop(outerLoop)
39 hatchObj.Evaluate() # 进行填充计算, 使图案吻合于边界。

```

<https://blog.csdn.net/Hulunbuir>

闭合多段线的图案填充

<https://blog.csdn.net/Hulunbuir>

七、绘图次序

The Python code for the drawing sequence example in the Autodesk AutoCAD 2014: ActiveX Reference Guide document is as follows:

1. Set drawing to display linewidths and create a True Color object.

```

1 doc.preferences.LineweightDisplay = 1 # 显示线宽
2 clr = doc.Application.GetInterfaceObject("AutoCAD.AcCmColor.19")

```

2. Draw a polyline

```

1 points = [4, 4, 0, 3, 5, 0, 6, 20, 0]
2 points = vtfloat(points)
3 polylineObj = msp.AddPolyline(points)
4 polylineObj.Lineweight = 211 # 设置线宽
5 clr.SetRGB(90, 110, 150)
6 polylineObj.TrueColor = clr # 指定颜色

```

3. Draw a line

```

1 startPoint = vtpt(5, 13)
2 endPoint = vtpt(5, 27)
3 lineObj = msp.AddLine(startPoint, endPoint)
4 lineObj.Lineweight = 211
5 clr.SetRGB(50, 80, 230)
6 lineObj.TrueColor = clr

```



report

^

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contents

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Fourth, draw circles and arcs

4.1 Draw a circle

4.2 Draw arc

Five, draw ellipse and ellipse arc

5.1 Draw an ellipse

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6.2 Circular pattern fill

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```

1 centerPoint = vtpt(10, 15, 0)
2 radius = 5
3 circleObj = msp.AddCircle(centerPoint, radius)
4 circleObj.LineWeight = 211
5 clr.SetRGB(60, 200, 220)
6 circleObj.TrueColor = clr
7
8 doc.Application.ZoomAll()
9 doc.Application.Update()

```

5. Get an extension dictionary and, if necessary, add a SortentsTable object.

```

1 eDictionary = msp.GetExtensionDictionary()
2
3 try:
4     sentityObj = eDictionary.GetObject("ACAD_SORTENTS")
5 except:
6     eDictionary.AddObject("ACAD_SORTENTS", "AcDbSortentsTable")
7
8 ObjIds = [plineObj.ObjectID, lineObj.ObjectID, circleObj.ObjectID] # 获取图元ID

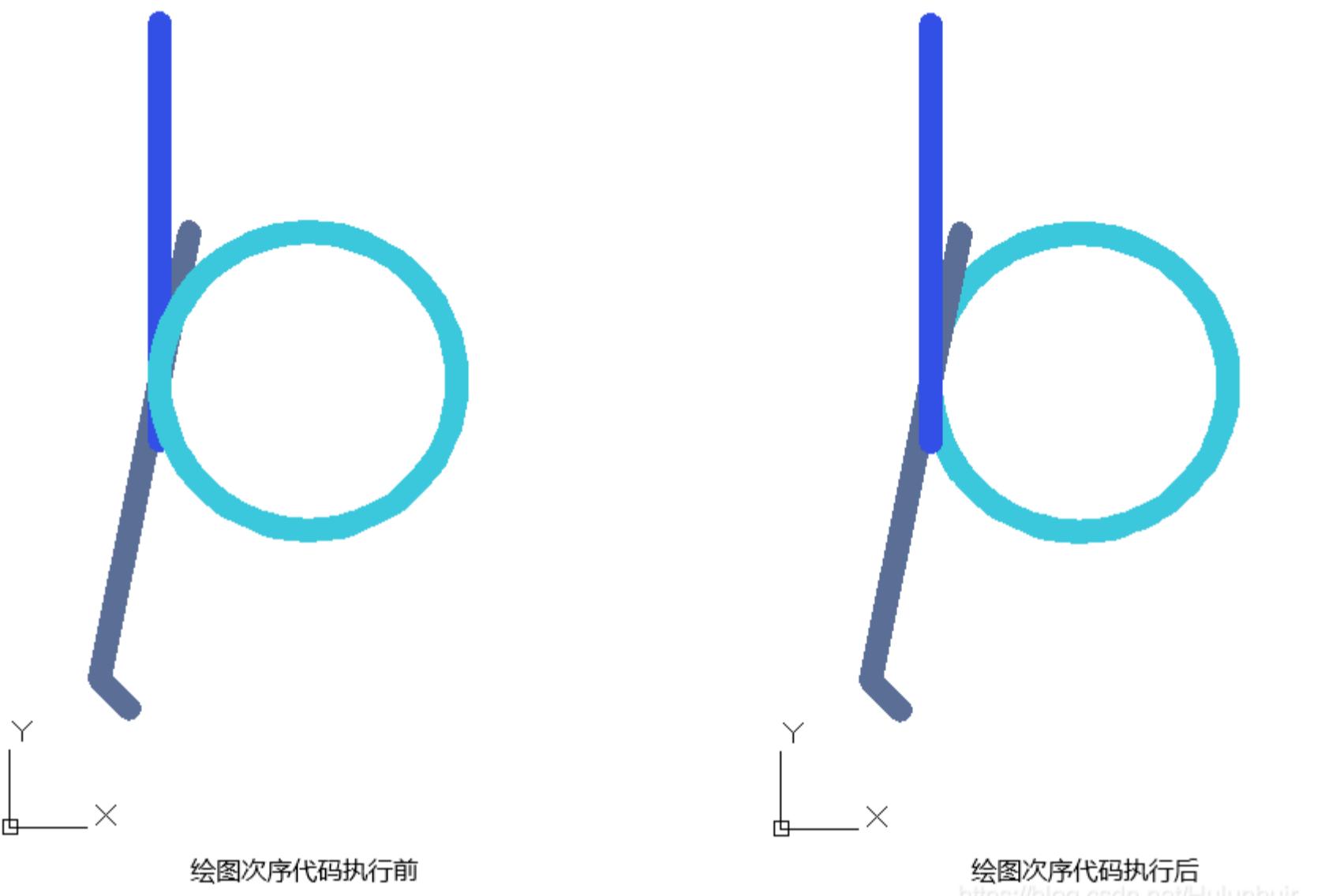
```

6. Move the circle object to the bottom

```

1 varObject = doc.ObjectIdToObject(ObjIds[2]) # 获取圆形图元
2 # varObject.Delete() 删除圆
3
4 varObject = vtobj([varObject, ])
5 sentityObj.MoveToBottom(varObject)
6 doc.Application.Update()

```



绘图次序代码执行后
<http://blog.csdn.net/Hulunbuir>

8. Other

```

1 import pyautocad.types
2 pyautocad.types.distance(Pnt1, Pnt2) # 计算点Pnt1和点Pnt2之间的距离
3 print(Pnt1)
4 print(tuple(Pnt1)) # 将点Pnt1坐标转化为元组
5 print(list(Pnt1)) # 将点Pnt1坐标转化为列表
6 print(Pnt1+Pnt2) # 两点对应坐标相加, 也支持其他数学运算。
7
8 LineObj.layer = "Python" # 指定图层

```

Nine, the end



The above is a brief introduction to the [Python secondary development of AutoCAD drawing](#).



Due to limited space, some non-critical functions have not been introduced in detail. If you have any questions, please email to:
liyang@alu.hit.edu.cn.

The realization of some functions in this article can not be separated from the great help of [ke1078](#) students. 'report' functions seem simple, but the first realization is quite difficult.

In view of the relatively small number of related sample codes, this article is featured, on the one hand, it is a summary of one's own phased

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contents

- 3.4 draw spline curve
- Fourth, draw circles and arcs
 - 4.1 Draw a circle
 - 4.2 Draw arc
- Five, draw ellipse and ellipse arc
 - 5.1 Draw an ellipse
 - 5.2 Draw an elliptical arc
- Six, entity and pattern fill
 - 6.1 Entity Fill
 - 6.2 Circular pattern fill
 - 6.3 Closed polyline pattern fill
- Seven, drawing order
- 8. Other
- Nine, the end

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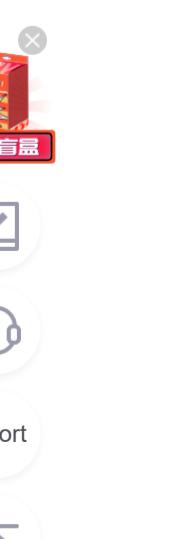
37 98 177



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- py - 久力及 AutoCAD 间的热推
- 一、前沿 cad 是 python 是 Active X 是 pyautocad 模块由俄罗斯工程师开发, 因参考实例较少, 工程需要, 现将模块中一些基本的用法, 做出简要说明, 叙述力求简洁明了...
- python 与 cad 交互 python 使用 pyautocad 操作 AutoCAD Mon... 9-13
- 第二行: acad.prompt() 用来在 cad 命令行下打印文字。第三行: 打印刚调取的 CAD 名字。2. 使用 pywin32 import pythoncom import win32com.client import mathwincad = w...
pyautocad 操作 cad weixin_30399797 的博客 1061
from pyautocad import Autocad # 自动连接上 cad, 只要 cad 是开着的, 就创建了一个 <pyautocad.api.Autocad> 对象。这个对象连接最近打开的 cad 文件。# 如果此时遇...
pyautocad-0.2.0.win32.exe 11-22
pyautocad-0.2.0.win32.exe
Process AutoCAD by python weixin_30834019 的博客 183
一、处理 AutoCAD 模块 pyautocad 1. 安装 pip install pyautocad
注: 1. 该操作会自动安装 comtypes 模块, 如果其他方式安装, 请自行...
AutoCAD 参数化绘图系统 09-18
本文是基于.NET 架构, 采用 C# 开发的电扶梯土建参数化系统, 只需要输入几个参数就可以生产土建布置图, 绘图效率大大提高。代码有详细的注释, 已在公司使用多年
AutoCAD 绘图 环境设置 08-05
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matlab 绘图 转 autocad 的 dwg 01-30
写了一份专利, 里面用到了一些 matlab plot 出来的图。专利部的同事让我转成 autocad 的 dwg 格式。原以为用原始数据在 autocad 里画几条曲线就 ok 了。后来想想, 没有那...
java 调用 AutoCAD 接口 绘图 工具类 08-07
利用 Java 调用 AutoCAD 接口 绘图, 实现绘制图形, 不是调用 Windows 绘制图形界面, 是真正的调用 AutoCAD 绘图, 只是给了测试代码, 具体功能自己摸索
cad 插件生成填充块闭合边界 04-15
cad 插件, 解决填充块重建命令对于部分填充块生成边界非闭合的情况。通过对填充块路径数据的解析, 以多段线重闭合边界。对于规划专业中地块信息导入到 GIS 有...
AutoCAD_C#Net 获取图案填充的边界线.docx 04-15
近日拜读了“北辰之北”的《C# CAD 二次开发图案填充对象边界提取》一文 (原文链接: https://blog.csdn.net/qq_fzp/article/details/52992615), 并在 Visual Studio 201...
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pyautocad 模块的使用
python 帮助 autocad_python 使用 pyautocad 操作 AutoCAD 最新发布 weixin_39548776 的博客 231
一、python 连接 AutoCAD 的两种基本方法1. 使用 pyautocad from pyautocad import Autocad pyacad = Autocad(create_if_not_exists=True) pyacad.prompt("Hello! Autoca...
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