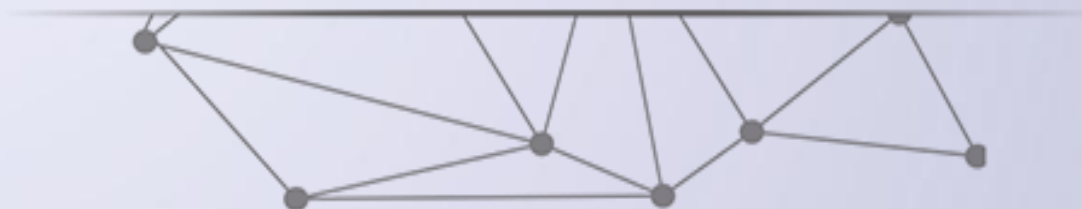




# 基本例子



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# 铅球飞行轨迹计算

- 铅球对象属性
  - xpos
  - ypos
  - xvel
  - Yvel
- 构建投射体类Projectile
- 创建和更新对象的变量



# 主函数

```
def main():  
    angle, vel, h0, time = getInputs()  
    shot = Projectile(angle, vel, h0)  
    while shot.getY() >= 0:  
        shot.update(time)  
    print("\nDistance traveled:{0:0.1f}meters.".format(shot.getX()))
```





# Projectile类

```
from math import sin, cos, radians

class Projectile:
    def __init__(self, angle, velocity, height):
        #根据给定的发射角度、初始速度和位置创建一个投射体对象
        self.xpos = 0.0
        self.ypos = height
        theta = radians(angle)
        self.xvel = velocity * cos(theta)
        self.yvel = velocity * sin(theta)

    def update(self, time):
        #更新投射体的状态
        self.xpos = self.xpos + time * self.xvel
        yvell = self.yvel - 9.8 * time
        self.ypos = self.ypos + time * (self.yvel + yvell) / 2.0
        self.yvel = yvell

    def getY(self):
        #返回投射体的角度
        return self.ypos

    def getX(self):
        #返回投射体的距离
        return self.xpos
```




# 引入对象,程序模块化

```
from Projectile import *

def getInputs():
    a = eval(input("Enter the launch angle (in degrees):"))
    v = eval(input("Enter the initial velocity (in meters/sec):"))
    h = eval(input("Enter the initial height (in meters):"))
    t = eval(input("Enter the time interval: "))
    return a,v,h,t

def main():
    angle,vel,h0,time = getInputs()
    shot = Projectile(angle,vel,h0)
    while shot.getY() >=0:
        shot.update(time)
        print("\nDistance traveled:{0:0.1f}meters.".format(shot.getX()))

if __name__ == "__main__":
    main()
```



选手1技术强  
铅球的出手角度41度  
出手速度14米/秒  
初始高度1.8米  
仿真间隔0.3秒  
铅球最远飞行距离22.2米

```
Enter the launch angle (in degrees):41
Enter the initial velocity (in meters/sec):14
Enter the initial height (in meters):1.8
Enter the time interval: 0.3
```

```
Distance traveled:22.2meters.
```

选手2力量大  
铅球的出手角度30度  
出手速度15米/秒  
始高度2米  
仿真间隔0.3秒  
铅球最远飞行距离23.4米

```
Enter the launch angle (in degrees):30
Enter the initial velocity (in meters/sec):15
Enter the initial height (in meters):2
Enter the time interval: 0.3
```

```
Distance traveled:23.4meters.
```

