Example: Moving Targets

Use types the character in the middle of the target to “hit” it
Example: Moving targets

Target class

- manages a single target

class Target:

    def __init__(self, center):
        """
        Constructor. Initializes a target with the given center. A target
        consists of 3 concentric circles with a random character in the center
        """
        circle1 = Circle(center, 50)
        circle1.setFill("yellow")

        circle2 = Circle(center, 40)
        circle2.setFill("green")

        circle3 = Circle(center, 30)
        circle3.setFill("white")

        self.shapes = [circle1, circle2, circle3]

        randomCharacter = random.choice(string.ascii_lowercase)
        self.text = Text(center, randomCharacter)

        self.vely = -random.randrange(1, 5)
Example: Moving targets

Target methods for drawing, moving, changing text, and figuring out if the target has been hit

```python
def draw(self, win):
    for shape in self.shapes:
        shape.draw(win)
    self.text.draw(win)

def move(self):
    for shape in self.shapes:
        shape.move(0, self.vely)
    self.text.move(0, self.vely)

def isHit(self, char):
    return char == self.text.getText()

def setText(self, newText):
    self.text.setText(newText)
```
Example: Moving targets

We can test Target before using it in our final program.

```python
if __name__ == "__main__":
    win = GraphWin("Test Targets", 600, 400)
    # test creating and drawing a target
    target1 = Target(Point(100, 300))
    target1.draw(win)
    target2 = Target(Point(500, 300))
    target2.draw(win)
    # Test moving a target
    win.getMouse()
    for i in range(100):
        target1.move()
    # Test isHit and setting text
    win.getMouse()
    target1.setText("a")
    print(target1.isHit("a"))
    print(target1.isHit("z"))
```
Example: Managing a list of Targets

```python
from graphics import *
from Target import *

def createTargets(win, numTargets):
    targets = []
    for i in range(numTargets):
        pos = Point(random.randrange(600), 600+random.randrange(100))
        target = Target(pos)
        target.draw(win)
        targets.append(target)
    return targets

def checkHitTargets(targets, key):
    numHit = 0
    for target in targets:
        if target.isHit(key):
            target.setText("Got it!")
            numHit = numHit + 1
    return numHit

def moveTargets(targets):
    for target in targets:
        target.move()
```
Example: main

def main():
    print("Press escape to exit")
    numTargets = int(input("Enter a number of targets: "))
    win = GraphWin("Target Practice", 600, 600)
    win.setBackground("white")

    targets = createTargets(win, numTargets)

    numHit = 0
    key = win.checkKey()
    while key != "Escape":
        if key is not None:
            numHit += checkHitTargets(targets, key)
            moveTargets(targets)
            update(30)
            key = win.checkKey()
    print("You hit \%d targets!"%numHit)

    main()