

Lecture #2. 파이썬 기초 (2)

2D 게임 프로그래밍

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Turtle 모듈

- 거북이가 펜을 가지고, 화면 위를 다니면서 그림을 그림.
- 전진, 후진, 회전, 원 그리기 등 다양하게 움직이면서 그림을 그릴 수 있음.



펜을 물고 있는 거북이


모듈의 사용 문법

모듈을 사용하기 위해 수입(import)함.

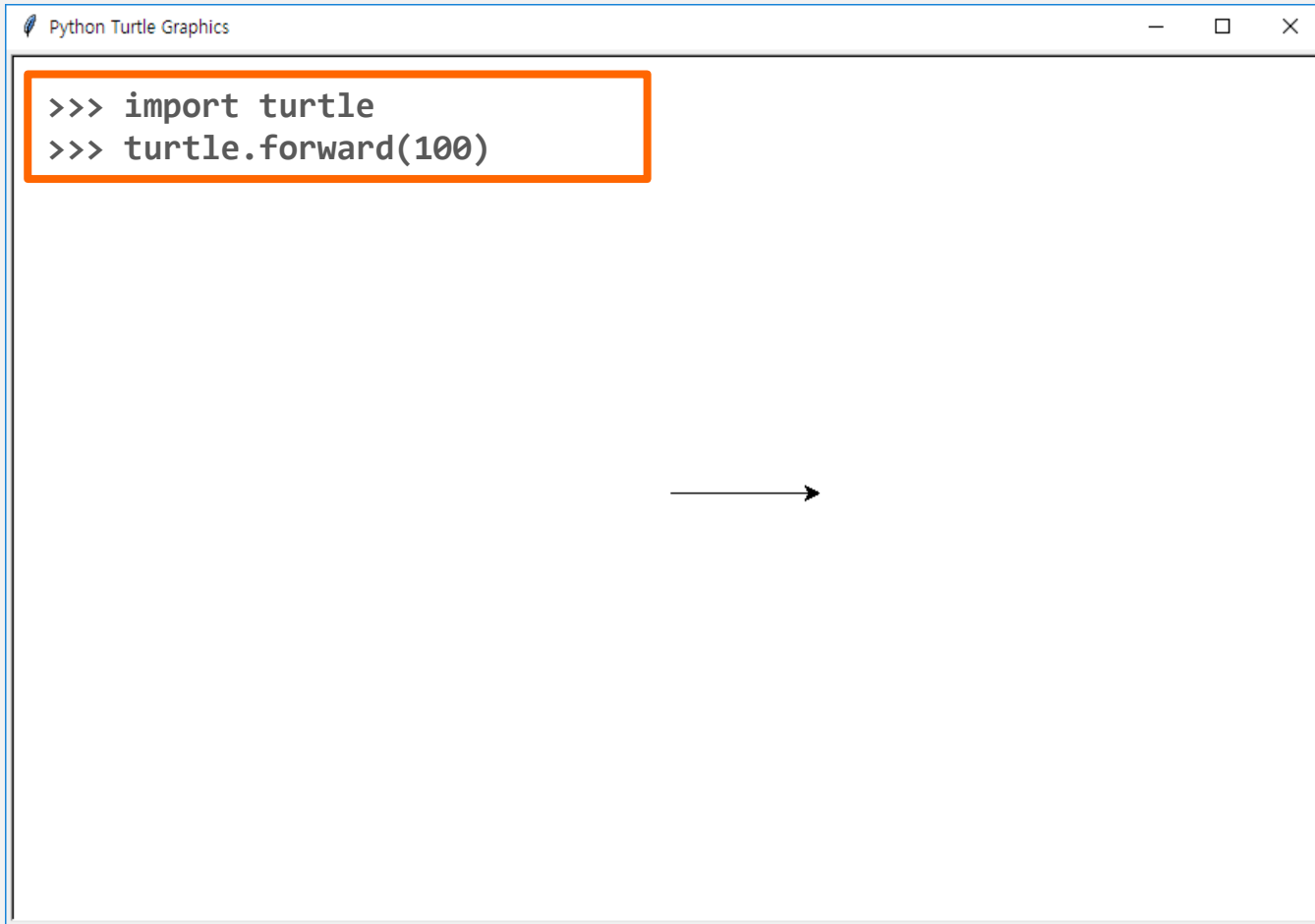


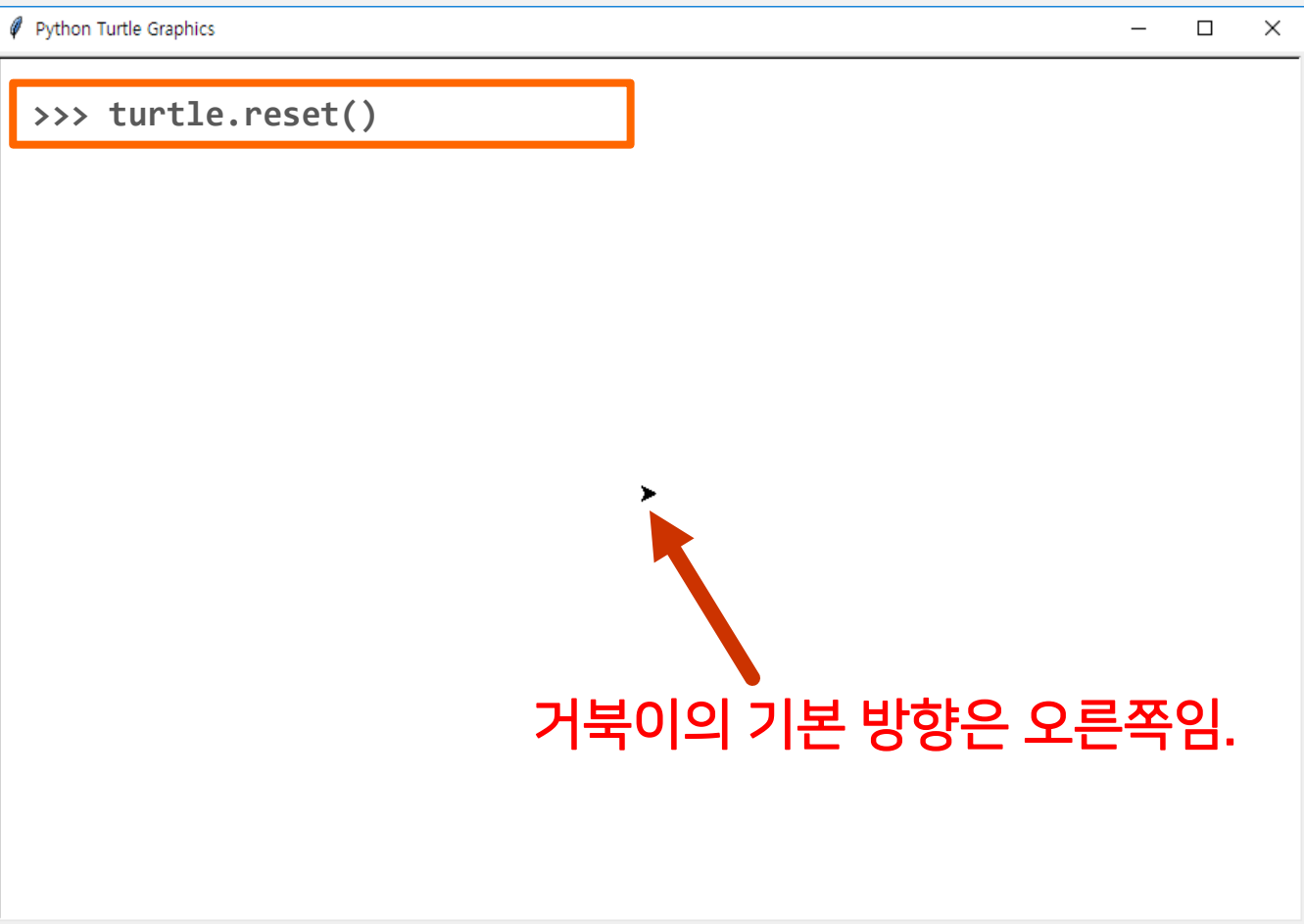
```
import turtle
```

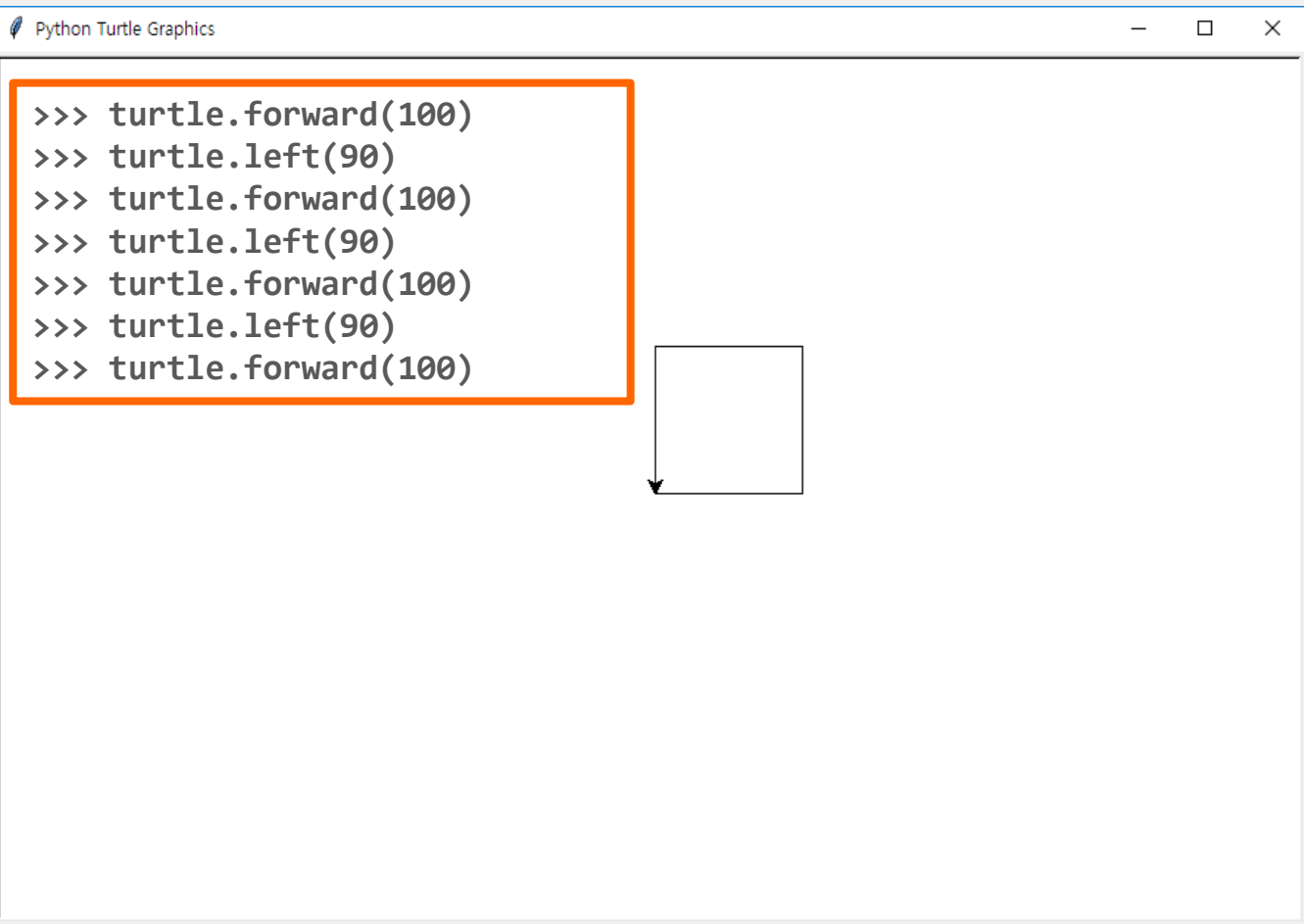
```
turtle.forward(100)
```



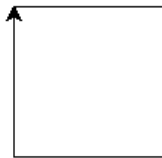
turtle 이 갖고 있는 기능(함수, function)
을 이용하여, 그림을 그린다.







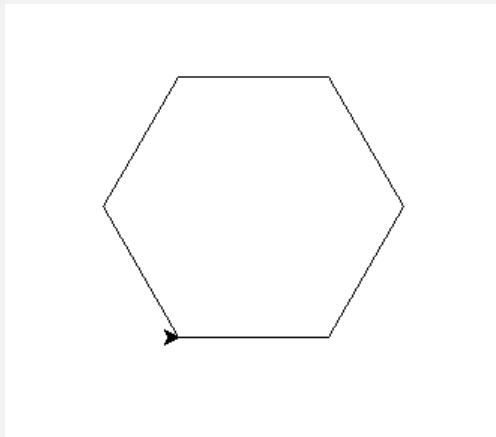
```
>>> turtle.reset()  
>>> turtle.forward(100)  
>>> turtle.right(90)  
>>> turtle.forward(100)  
>>> turtle.right(90)  
>>> turtle.forward(100)  
>>> turtle.right(90)  
>>> turtle.forward(100)
```

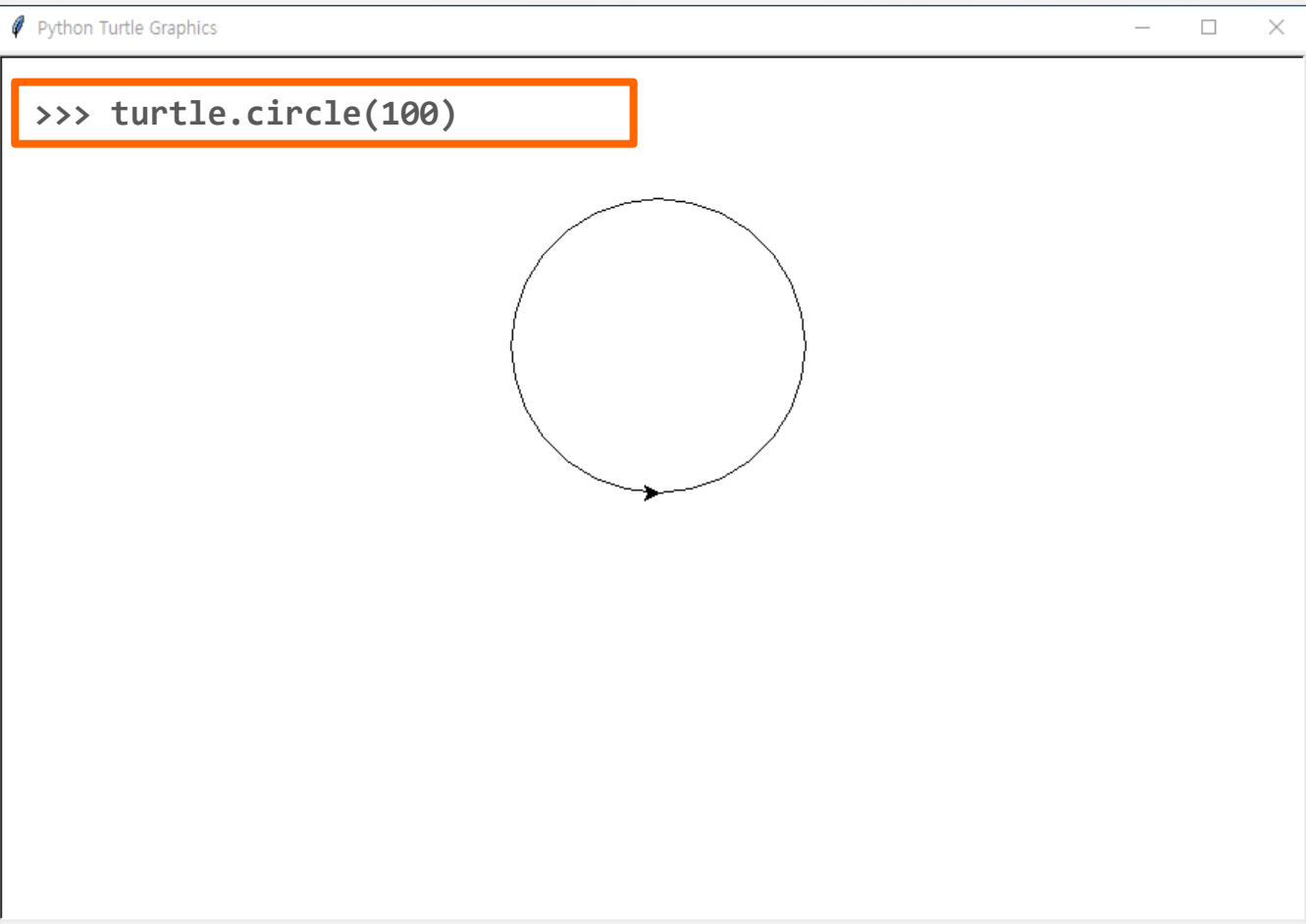


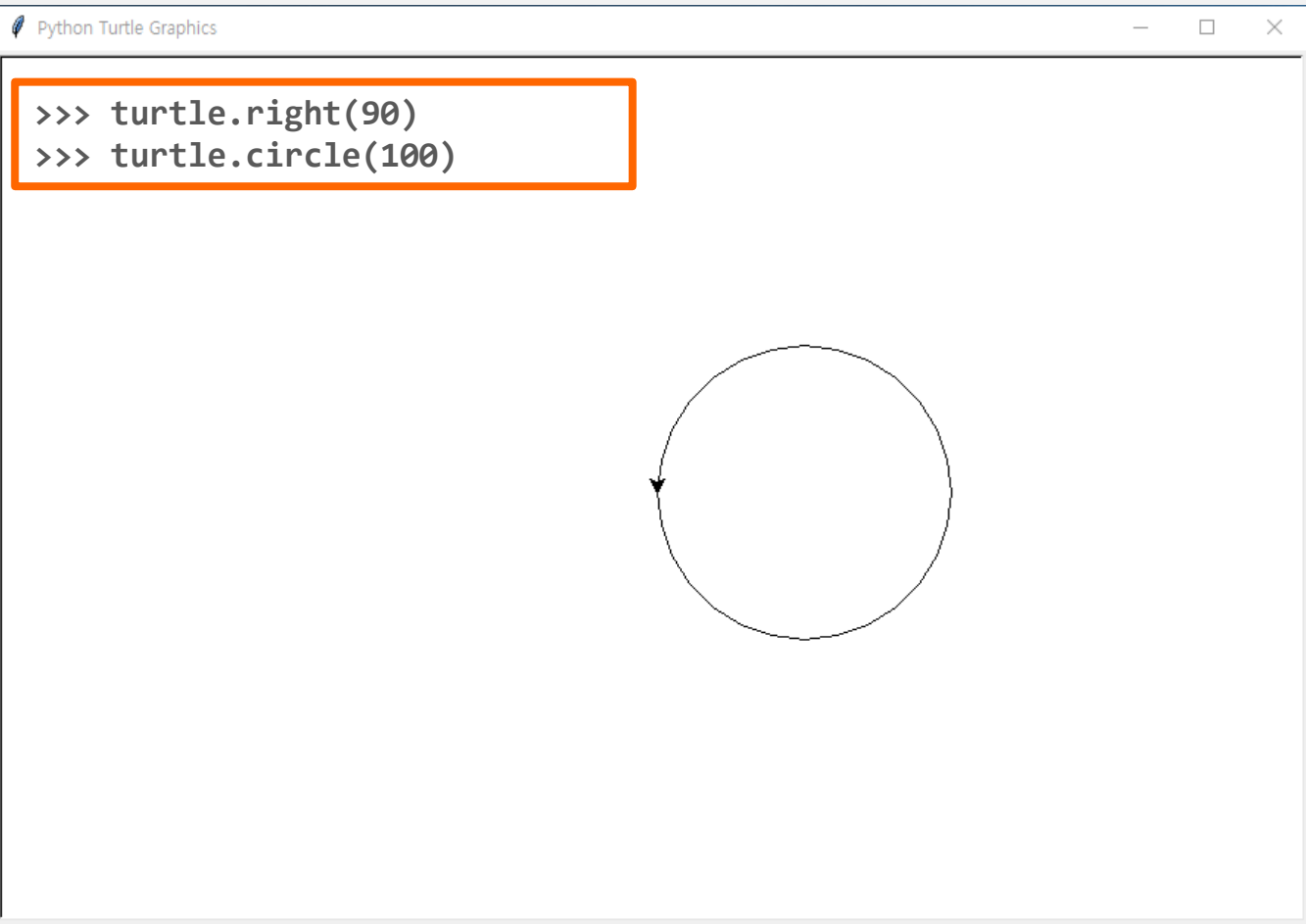
```
>>> turtle.forward(100)
>>> turtle.left(120)
>>> turtle.forward(100)
>>> turtle.left(120)
>>> turtle.forward(100)
```



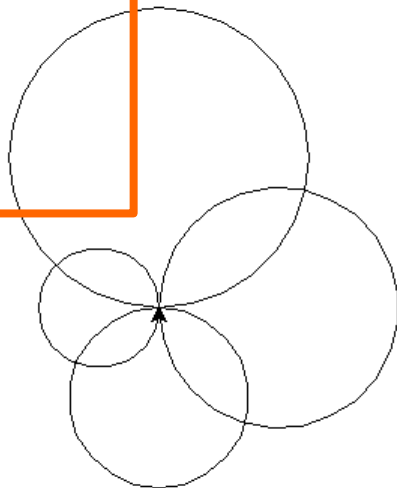
퀴즈 #1: 정육각형을 그려보자!



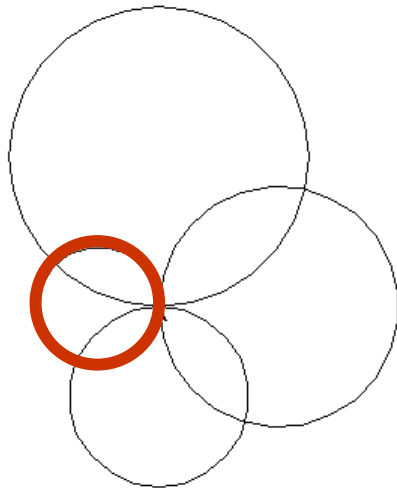




```
>>> turtle.circle(100)
>>> turtle.right(90)
>>> turtle.circle(80)
>>> turtle.right(90)
>>> turtle.circle(60)
>>> turtle.right(90)
>>> turtle.circle(40)
```



```
>>> turtle.updo()  
>>> turtle.undo()
```

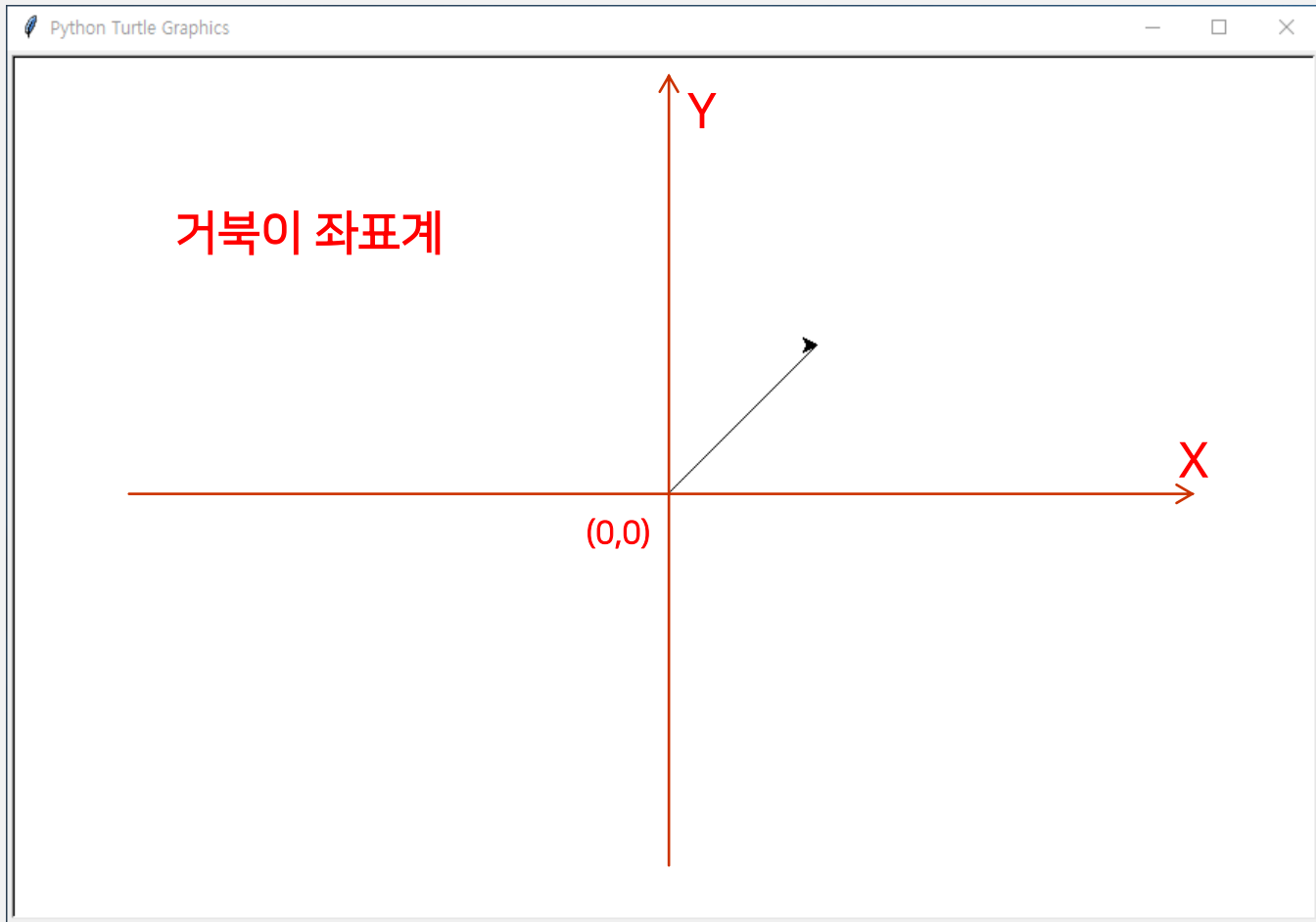


마지막에 그렸던 원이 없어짐.
이전 상태로 되돌아감.

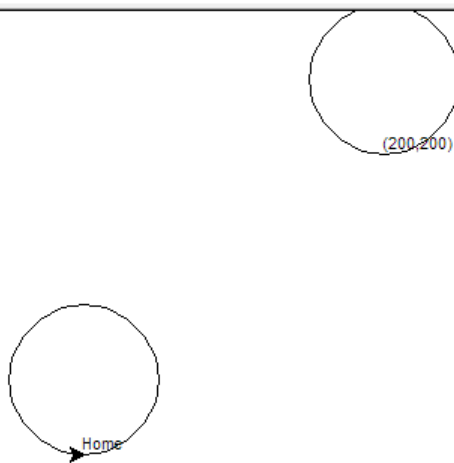
```
>>> turtle.reset()  
>>> turtle.goto(100, 100)
```



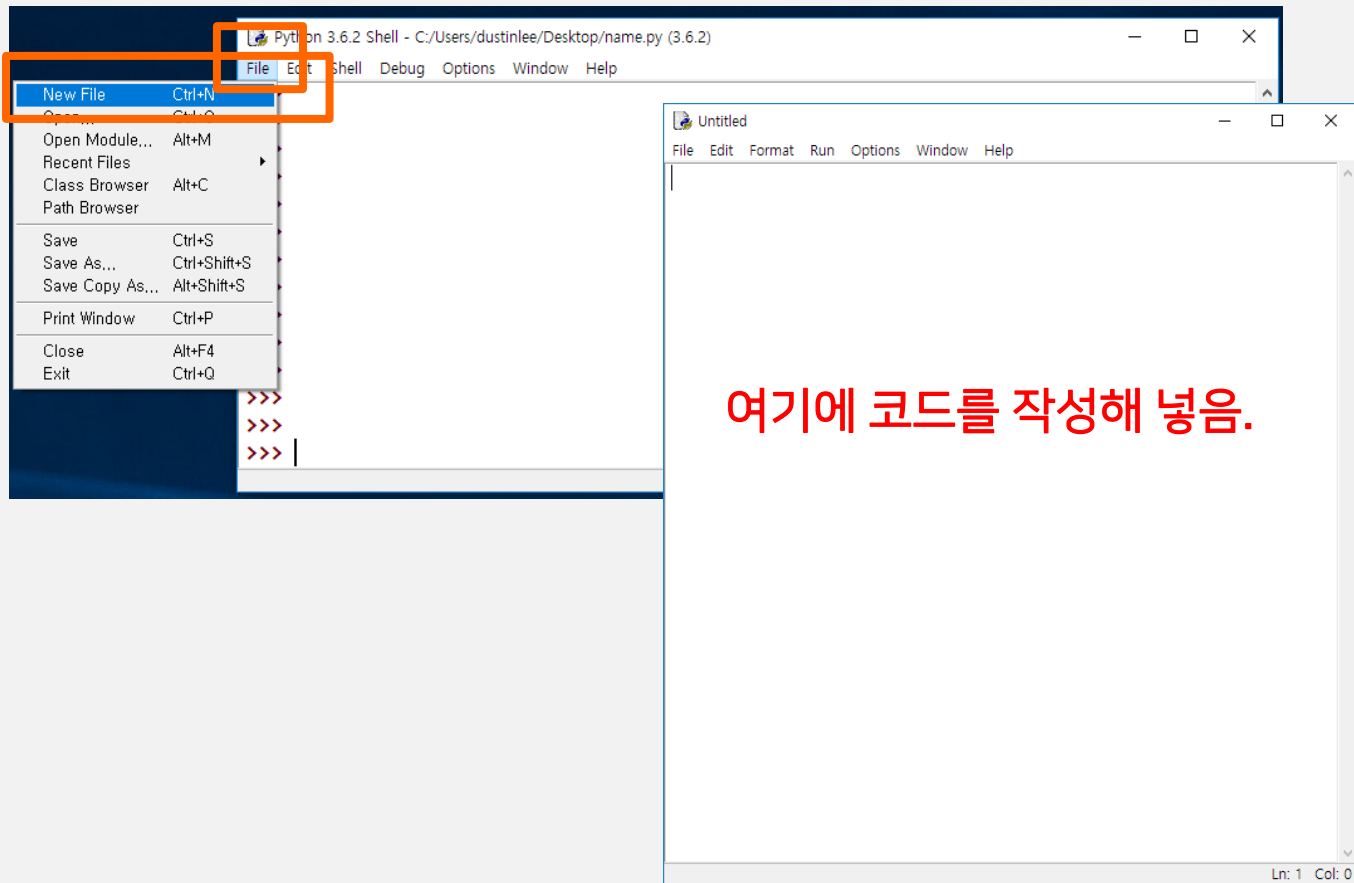
(100,100) 으로 이동한다.
거북이의 머리방향은 변함없이 여전히 오른쪽 방향.



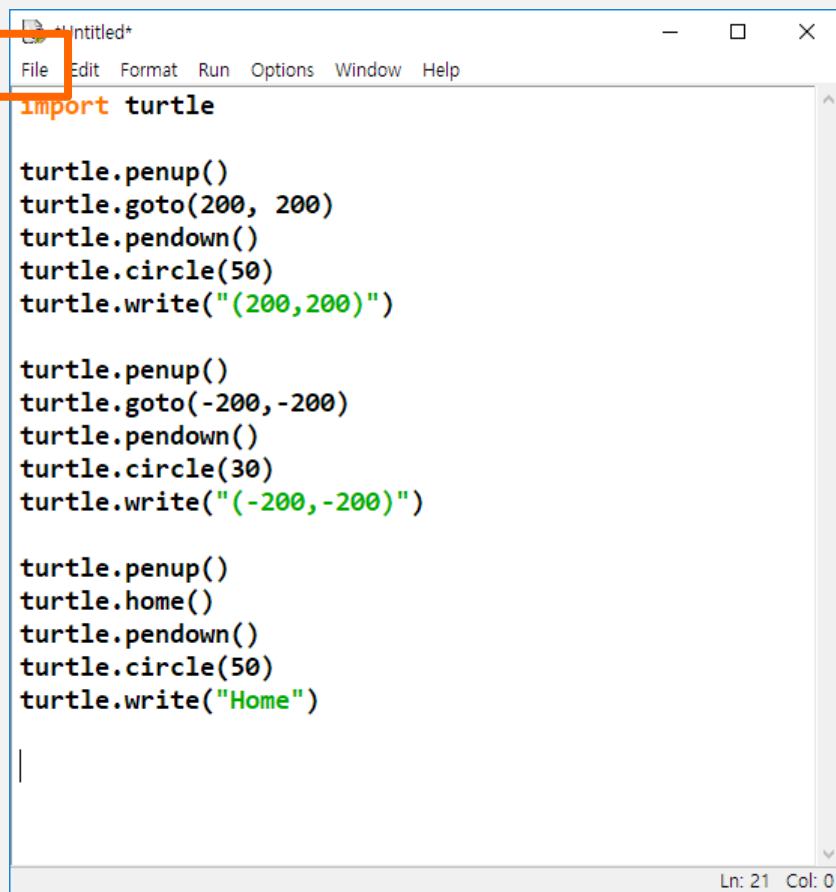
```
>>> turtle.penup()
>>> turtle.goto(200, 200)
>>> turtle.pendown()
>>> turtle.circle(50)
>>> turtle.write("(200,200)")
>>>
>>> turtle.penup()
>>> turtle.goto(-200,-200)
>>> turtle.pendown()
>>> turtle.circle(30)
>>> turtle.write("(-200,-200)")
>>>
>>> turtle.penup()
>>> turtle.home()
>>> turtle.pendown()
>>> turtle.circle(50)
>>> turtle.write("Home")
```



프로그램을 파일로 만들어서 저장



New File	Ctrl+N
Open...	Ctrl+O
Open Module...	Alt+M
Recent Files	
Class Browser	Alt+C
Path Browser	
Save	Ctrl+S
Save As...	Ctrl+Shift+S
Save Copy As...	Alt+Shift+S
Print Window	Ctrl+P
Close	Alt+F4
Exit	Ctrl+Q



The screenshot shows a Python IDE window titled "Untitled*" with a menu bar (File, Edit, Format, Run, Options, Window, Help). The "File" menu is open, and the "Save" option is highlighted. The code in the editor is as follows:

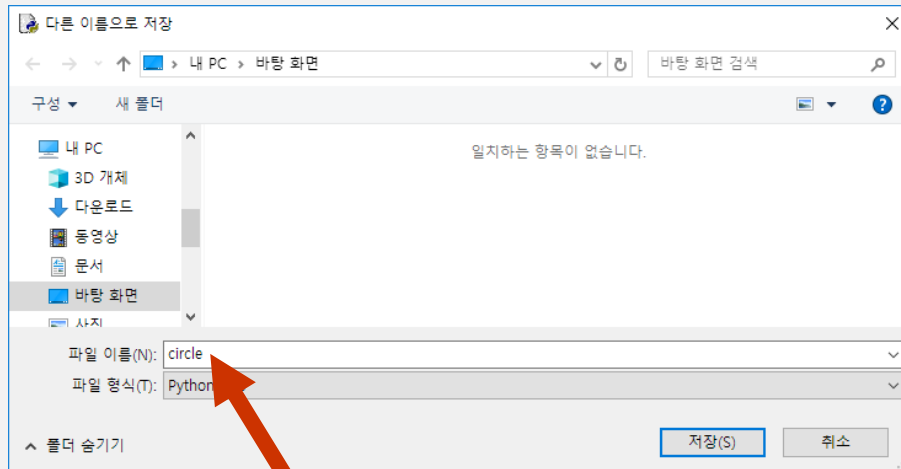
```
import turtle

turtle.penup()
turtle.goto(200, 200)
turtle.pendown()
turtle.circle(50)
turtle.write("(200,200)")

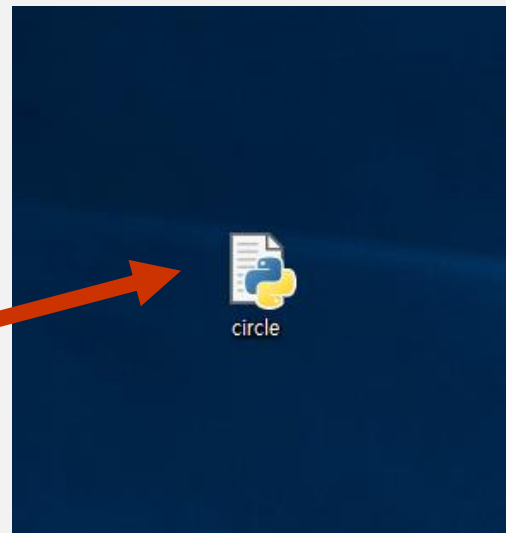
turtle.penup()
turtle.goto(-200,-200)
turtle.pendown()
turtle.circle(30)
turtle.write("(-200,-200)")

turtle.penup()
turtle.home()
turtle.pendown()
turtle.circle(50)
turtle.write("Home")
```

The status bar at the bottom right indicates "Ln: 21 Col: 0".



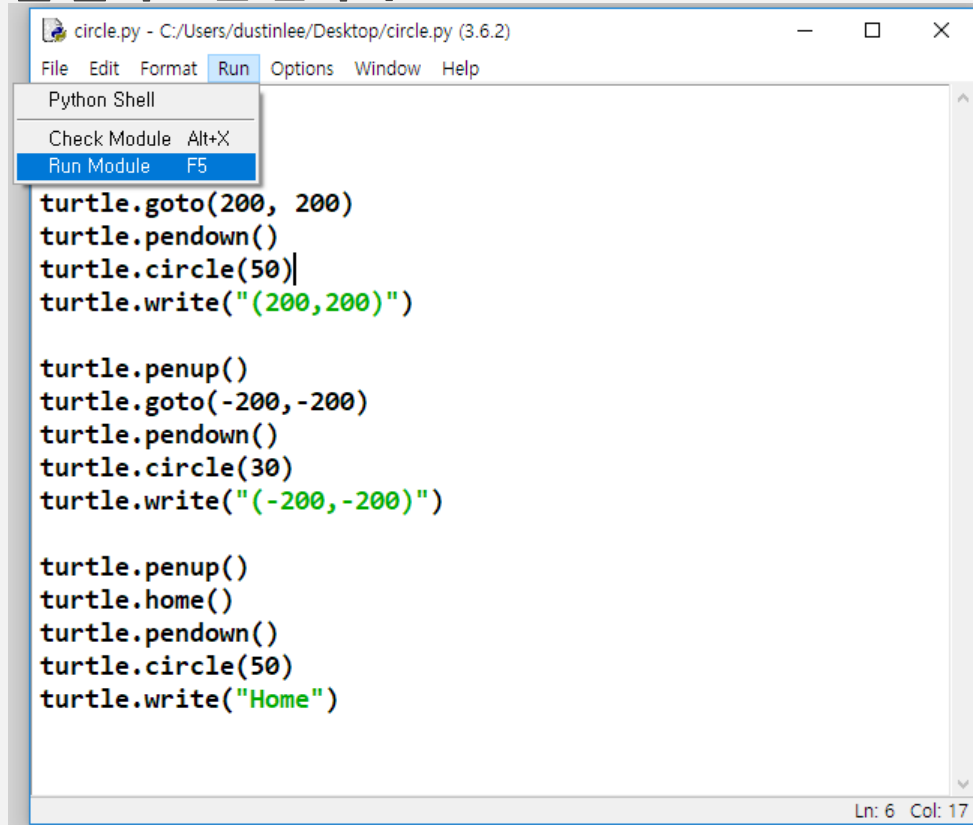
circle이라는 이름으로 바탕
화면에 저장.



바탕화면에 circle.py 라는
이름의 파일이 생성됨.

프로그램 실행 방법 #1

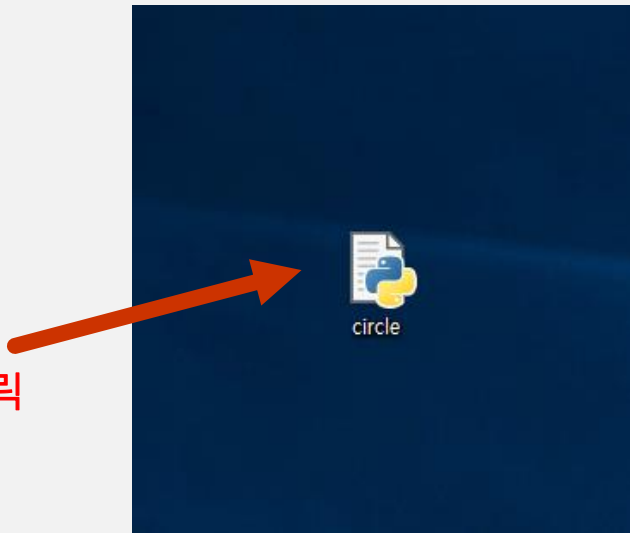
- Run → Run Module 을 클릭 또는 단축기 F5

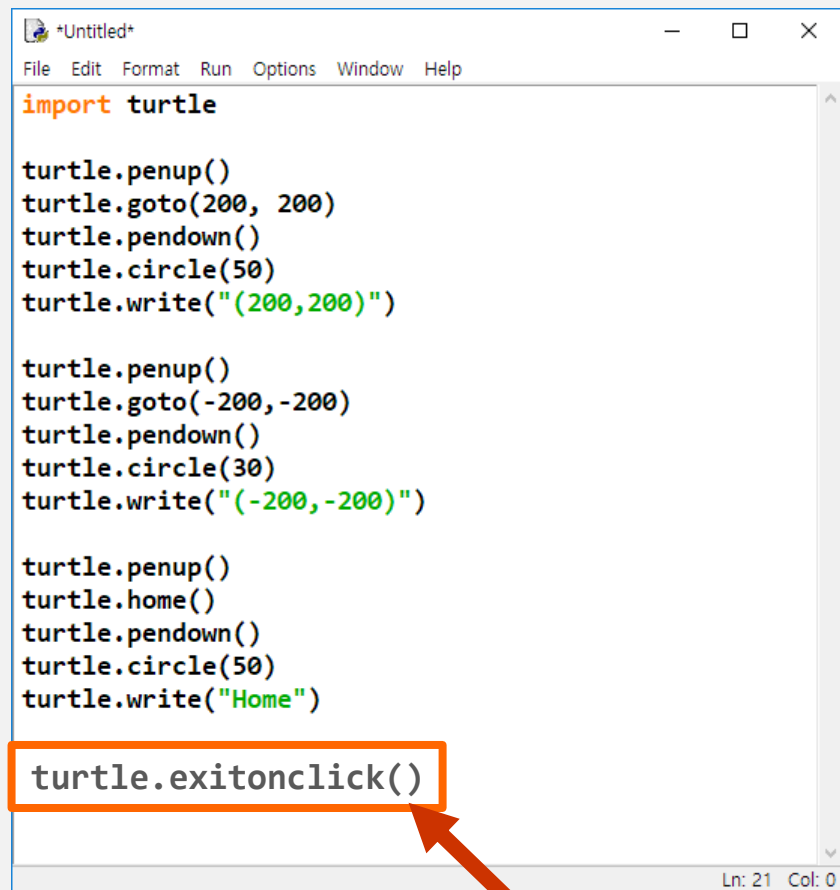


프로그램 실행 방법 #2

- 프로그램 파일을 더블 클릭하여 실행.
- 문제점은?

circle.py 를 더블 클릭





```
*Untitled*
File Edit Format Run Options Window Help

import turtle

turtle.penup()
turtle.goto(200, 200)
turtle.pendown()
turtle.circle(50)
turtle.write("(200,200)")

turtle.penup()
turtle.goto(-200, -200)
turtle.pendown()
turtle.circle(30)
turtle.write("(-200, -200)")

turtle.penup()
turtle.home()
turtle.pendown()
turtle.circle(50)
turtle.write("Home")

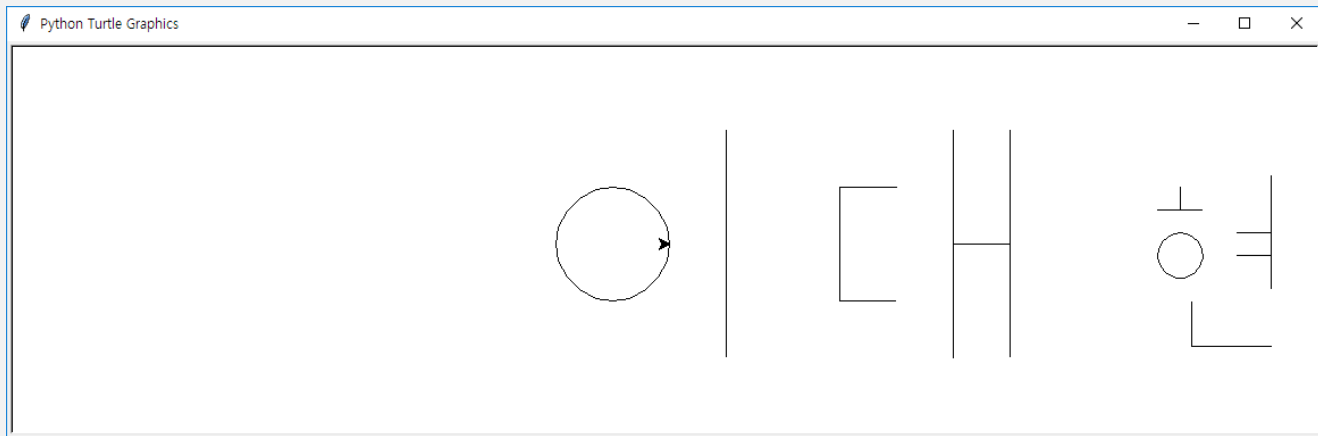
turtle.exitonclick()
```

Ln: 21 Col: 0

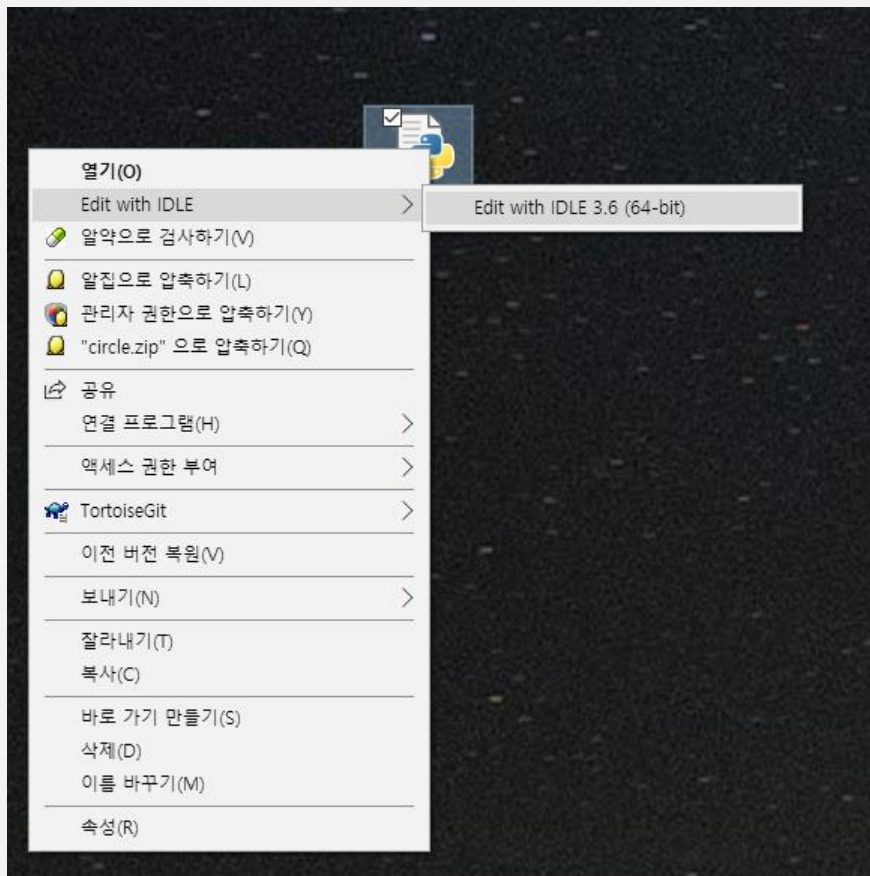
코드 마지막 부분에 exitonclick() 추가.

DRILL #3. 자기 이름 그리기

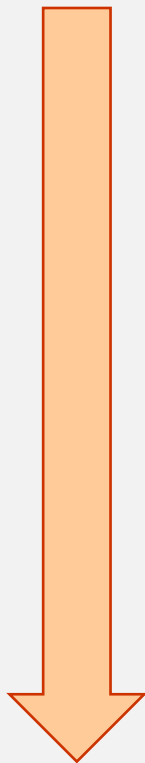
- 파일로 작성하여, 바탕화면에 name.py 로 저장하고, 더블클릭해서 실행.



마우스 오른쪽 버튼을 클릭하면, 소스코드를 직접 편집 가능.



파이썬 문장은 위에서부터 아래로 차례로 실행



```
circle.py - C:\Users\dustinlee\Desktop\circle.py (3.6.2)
File Edit Format Run Options Window Help

import turtle

turtle.penup()
turtle.goto(200, 200)
turtle.pendown()
turtle.circle(50)
turtle.write("(200,200)")

turtle.penup()
turtle.goto(-200, -200)
turtle.pendown()
turtle.circle(30)
turtle.write("(-200,-200)")

turtle.penup()
turtle.home()
turtle.pendown()
turtle.circle(50)
turtle.write("Home")

turtle.exitonclick()
```

Ln: 1 Col: 0

문법: 조건문 (Conditional Statement)

- 조건을 검사하여, 그 결과에 따라 처리를 하는 문장

```
if (age >= 60):  
    print(age)  
    print("you are very old")
```



만약 age가 60 이상이면, age의 값을 출력하고, 이어
서 "you are very old"라는 문자열을 출력하라.
age 가 60보다 작으면? 아무것도 하지 않음.

이 조건이 참(True)이면,

if (age >= 60):

print(age)
print("you are very old")



여기 블록에 적힌 대로 실행하라.

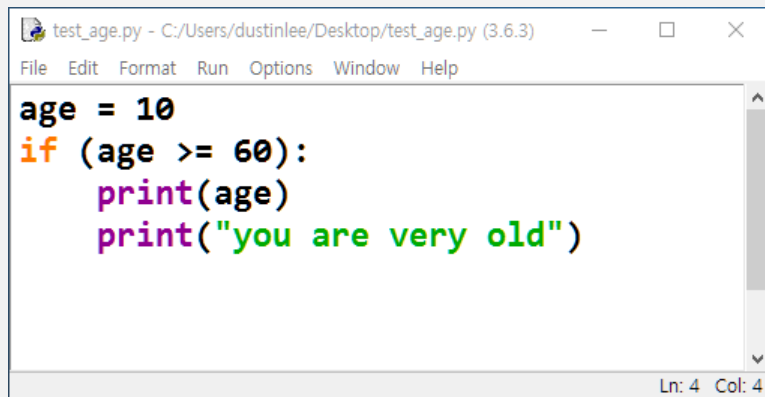
들여쓰기(indentation)

*** 매우 중요 ***

일반적으로 공백4개씩

조건이 참이면, 들여쓰기된 블록을 실행함.

test_age.py



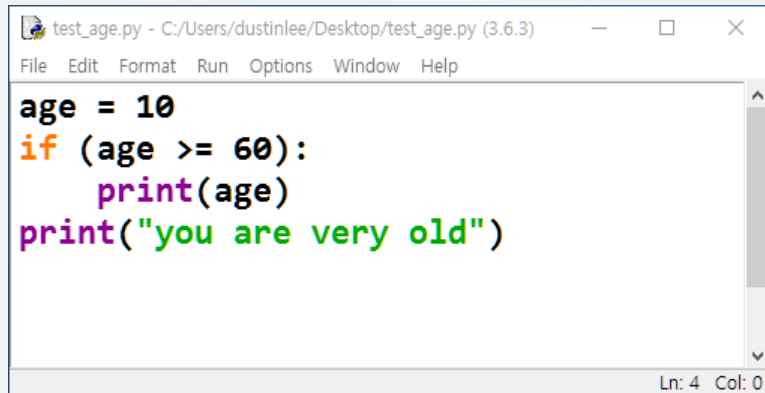
The screenshot shows a Python IDE window titled "test_age.py - C:/Users/dustinlee/Desktop/test_age.py (3.6.3)". The menu bar includes File, Edit, Format, Run, Options, Window, and Help. The code in the editor is as follows:

```
age = 10
if (age >= 60):
    print(age)
    print("you are very old")
```

The status bar at the bottom right indicates "Ln: 4 Col: 4".



test_age.py



The screenshot shows the same Python IDE window, but the code has been corrected. The indentation for the print statements is now correct:

```
age = 10
if (age >= 60):
    print(age)
print("you are very old")
```

The status bar at the bottom right indicates "Ln: 4 Col: 0".

문법: 조건문 (Conditional Statement) 확장형

```
if (age >= 60):  
    print(age)  
    print("you are very old")  
else:  
    print(age)  
    print("you are young")
```

문법: 조건문 (Conditional Statement) 확장형

```
if (age >= 60):  
    print(age)  
    print("you are very old")  
elif (age <= 20):  
    print(age)  
    print("you are very young")  
else:  
    print(age)  
    print("you are young")
```

문법: while 반복문 (Iteration Statement)

- 어떤 조건을 만족하는 동안, 계속해서 반복적으로 실행하는 문장.

```
while <조건문>:  
    <수행할 문장1>  
    <수행할 문장2>  
    <수행할 문장3>  
    ...
```

```
import turtle
```

```
count = 10
```

```
while (count > 0):  
    turtle.forward(100)  
    turtle.left(30)  
    count = count - 1
```



count가 0 보다 크면 계속해서 반복한다. 뭘? (turtle을 앞으로 100 이동,
그리고 왼쪽으로 30도 회전, 그리고 count 값 하나 감소)


```
import turtle
```

```
count = 10
```

```
while (count > 0):
```

```
    turtle.forward(100)
```

```
    turtle.left(30)
```

```
    count = count - 1
```

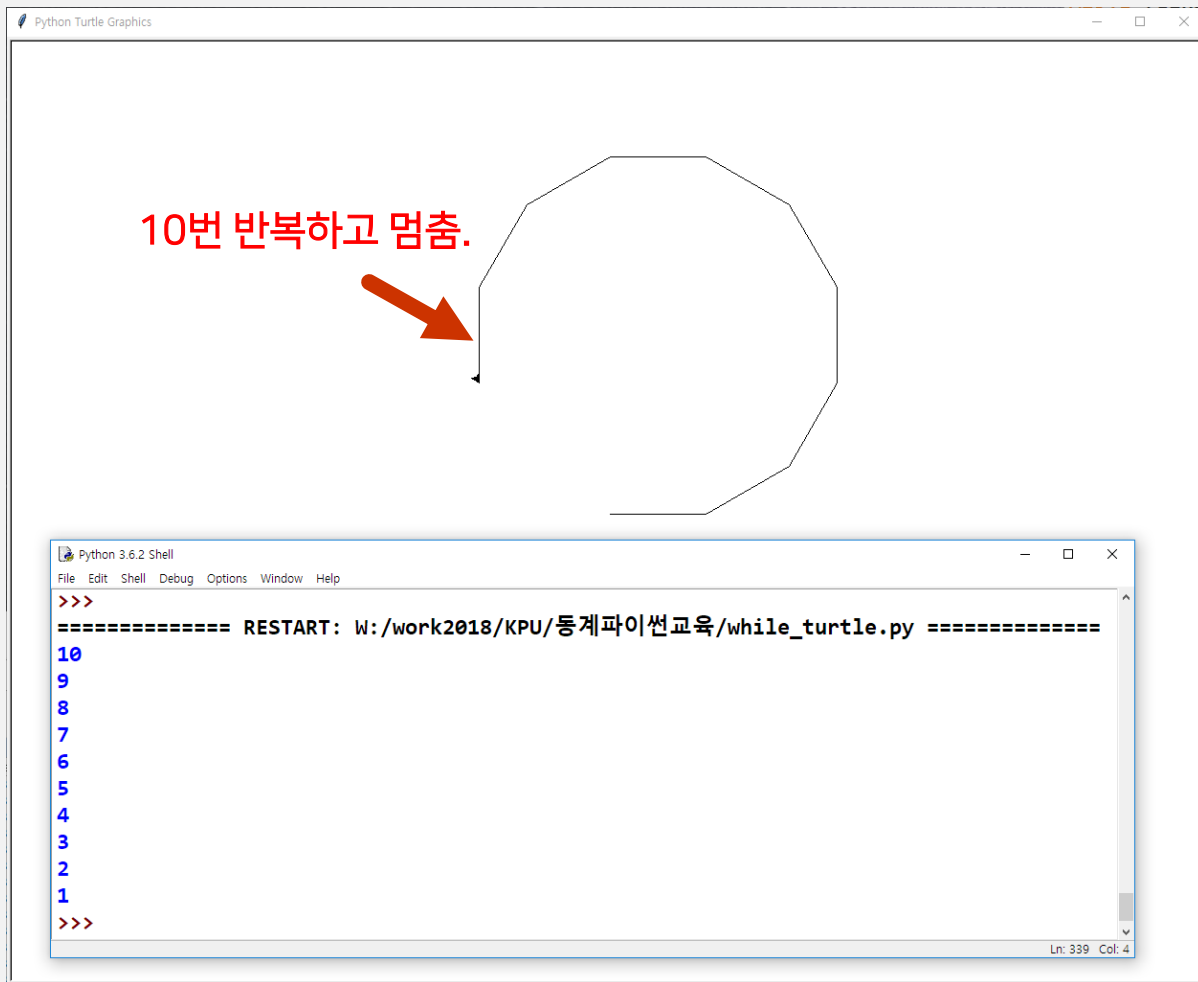
이 조건이 참(True)인 동안



들여쓰기(indentation)

*** 매우 중요 ***

여기 블록을 반복적으로 실행한다.



DRILL #4. 모눈 그리기(길이 500, 간격 100)

