Draw a line

How can we draw a complete horizontal line across any image?

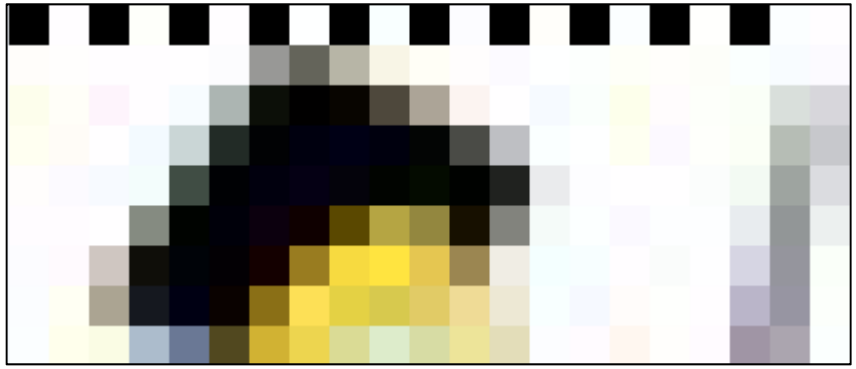
A.
```
for x in range(pic.size[0]):
    pic.putpixel( (x,2),(0,0,0))
```

B.
```
for x in range(pic.size[0]-1):
    pic.putpixel( (x,2),(0,0,0))
```

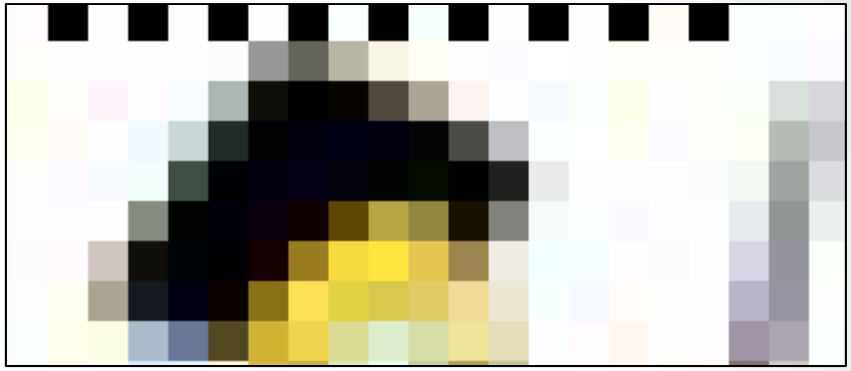
```
pic.size == (21,30)
```

```
for x in range(1,19,2):
    pic.putpixel((x,0),(0,0,0))
```

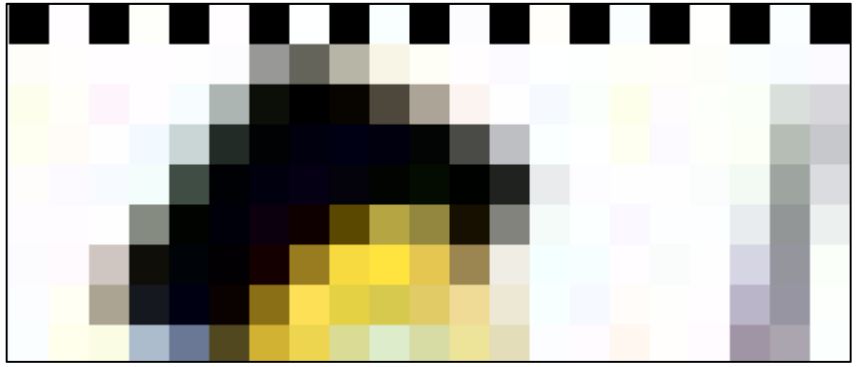
A.



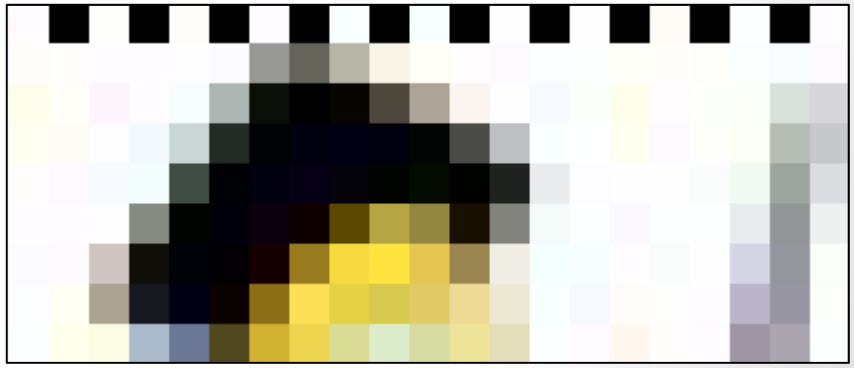
B.



C.



D.



E. Something else

Nested loops

```
for x in range(2):
    for y in range(2):
        …
```

Nested loops

```
for x in [1, 2]:
    for y in [3,4]:
        print(y)
```

What will the output look like?

A.

```
1
2
3
4
```

B.

```
3
4
```

C.

```
3
3
4
4
```

D.

```
3
4
3
4
```

E.

```
3
4
4
```

Nested loops

```
for y in [1, 3]:
    for x in [2,4]:
        print(x,y)
```

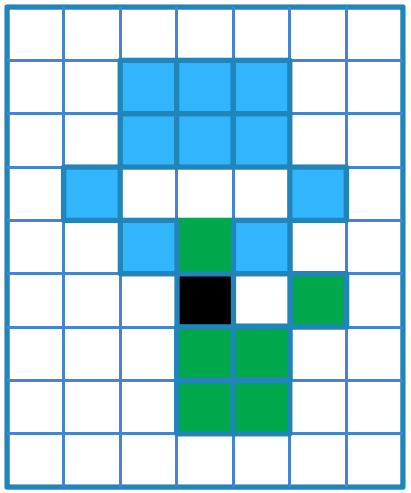
What will the output look like?

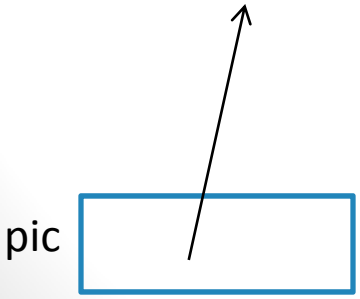
A.	B.	C.	D.	E.
2 1 2 3 4 1 4 3	2 1 4 1 2 3 4 3	1 2 1 4 3 2 3 4	1 2 3 2 1 4 3 4	2 1 4 3 2 3 4 1

test04

Nested loops for modifying the whole picture

```
for x in range(pic.size[1]//2):
    for y in range(pic.size[0]):
      pic.putpixel( (x,y), (100,100,100))
```



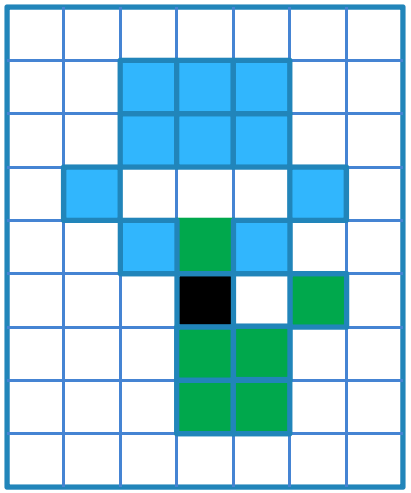


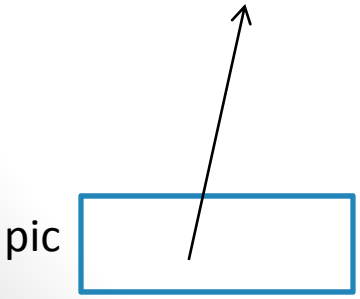
What does the code above do?

A. Turns the top half of the picture gray
B. Turns the bottom half of the picture gray
C. Turns the right half of the picture gray
D. Turns the left half of the picture gray
E. Something else

Nested loops for modifying the whole picture

```
for x in range(pic.size[0]//2):
    for y in range(pic.size[1]):
      pic.putpixel( (x,y), (100,100,100))
```





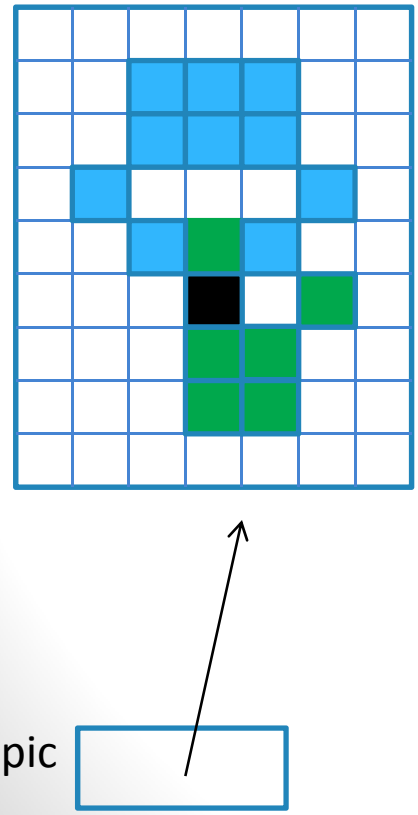
What does the code above do?

A. Turns the top half of the picture gray
B. Turns the bottom half of the picture gray
C. Turns the right half of the picture gray
D. Turns the left half of the picture gray
E. Something else

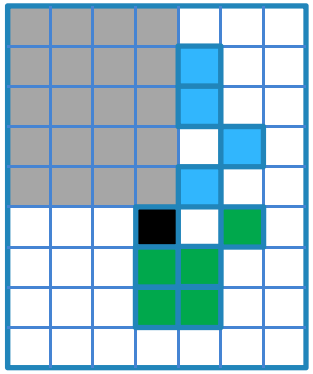
test05

If statements work in loops too!

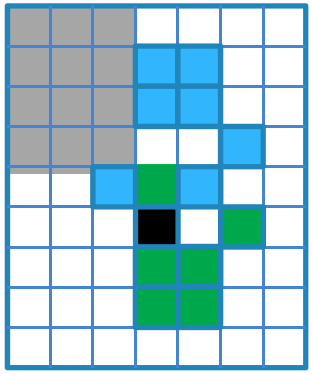
```
for x in range(pic.size[0]):
    for y in range(pic.size[1]):
        if y < pic.size[1]//2 and x < pic.size[0]//2:
            pic.putpixel( (x,y), (100, 100, 100))
```



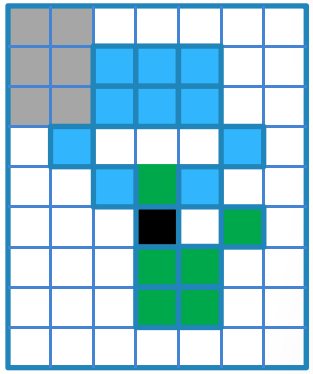
A



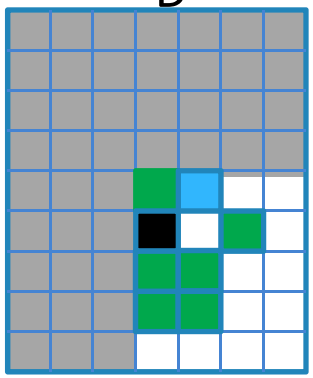
B



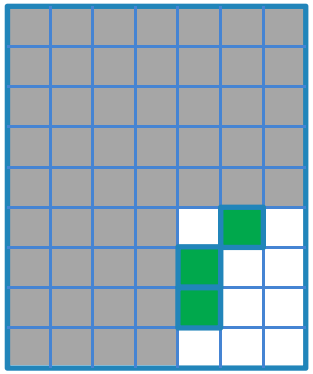
C



D



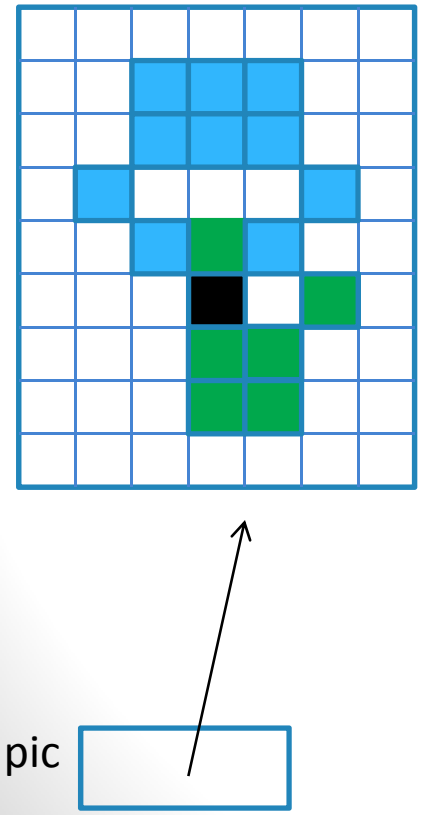
E



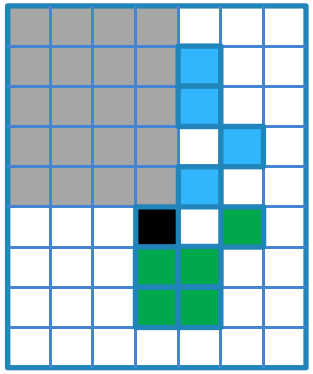
What is the resulting pic?

If statements work in loops too!

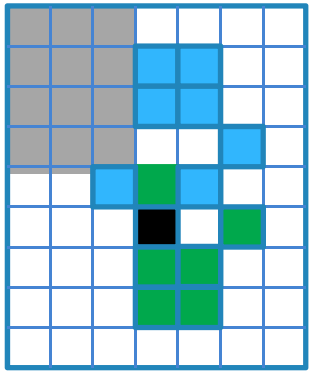
```
for x in range(pic.size[0]):
    for y in range(pic.size[1]):
        if y < pic.size[1]//2 or x < pic.size[0]//2:
            pic.putpixel( (x,y), (100, 100, 100))
```



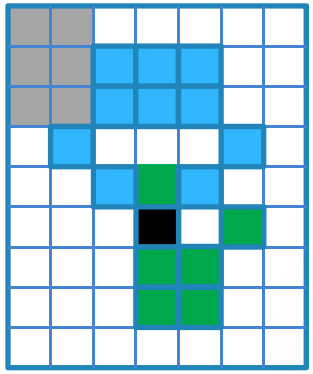
A



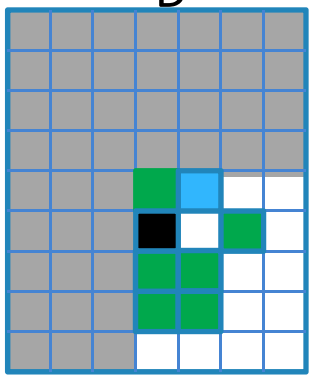
B



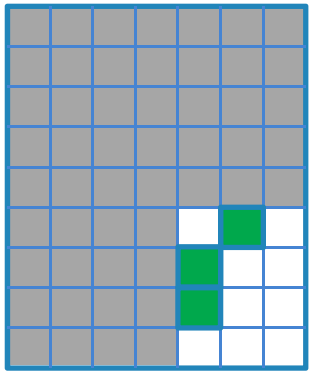
C



D



E

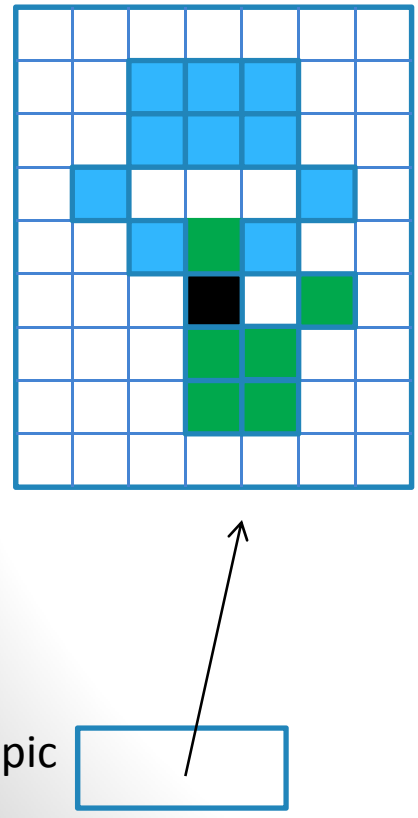


What is the resulting pic?

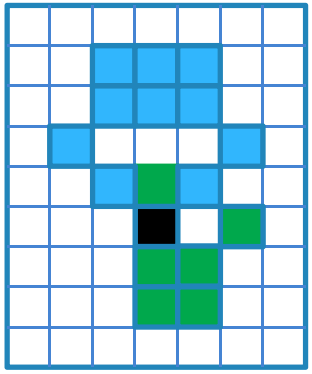
test06

Flipping the image upside down

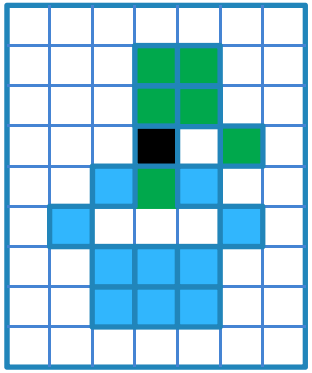
```
for x in range(pic.size[0]):
    for y in range(pic.size[1]):
        (r,g,b) = pic.getpixel( (x,y) )
        pic.putpixel( (x,pic.size[1]-y-1), (r,g,b) )
```



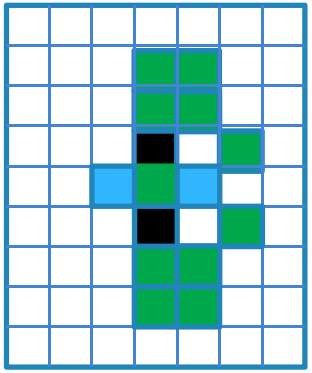
A



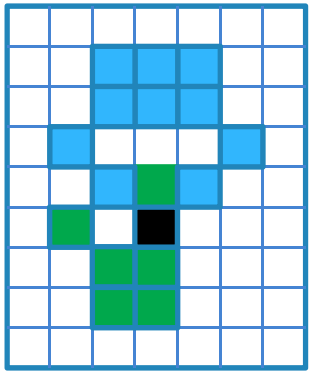
B



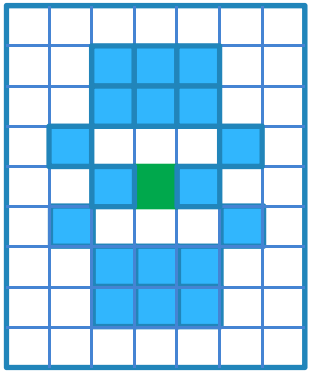
C



D



E



What is the resulting pic?