

2022년 IoT기반 스마트 솔루션 개발자 양성과정



Programming : Python

9-pygame

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pygame

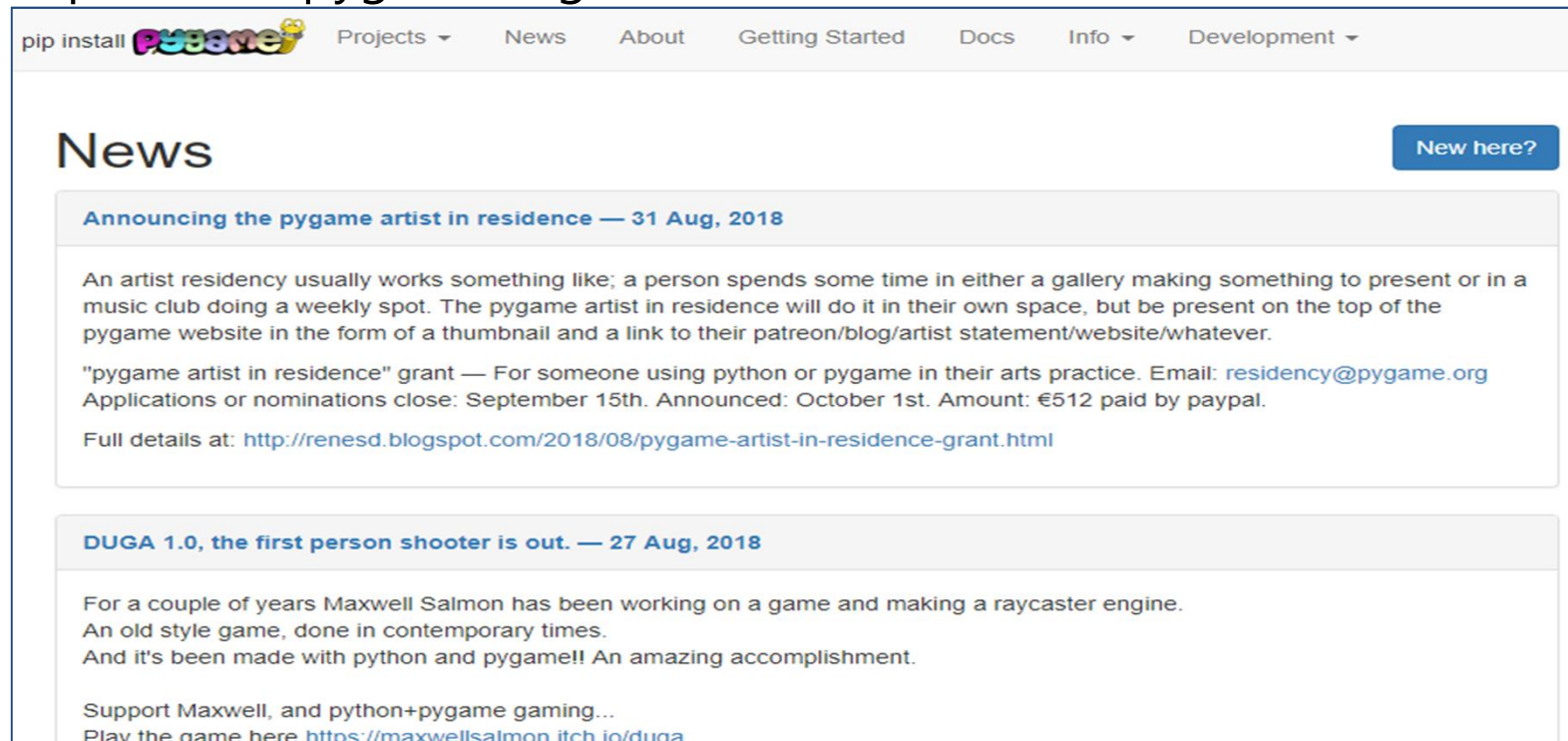


Original author(s)	Lenard Lindstrom, René Dudfield, Pete Shinnars, Nicholas Dudfield, Thomas Kluyver, others
Developer(s)	pygame Community
Initial release	28 October 2000
Stable release	1.9.4 / July 19, 2018
Preview release	1.9.5.dev
Repository	https://github.com/pygame/pygame/
Written in	Python, C, and Assembly
Operating system	Cross-platform
Type	API
License	GNU Lesser General Public License
Website	https://www.pygame.org



pygame.org

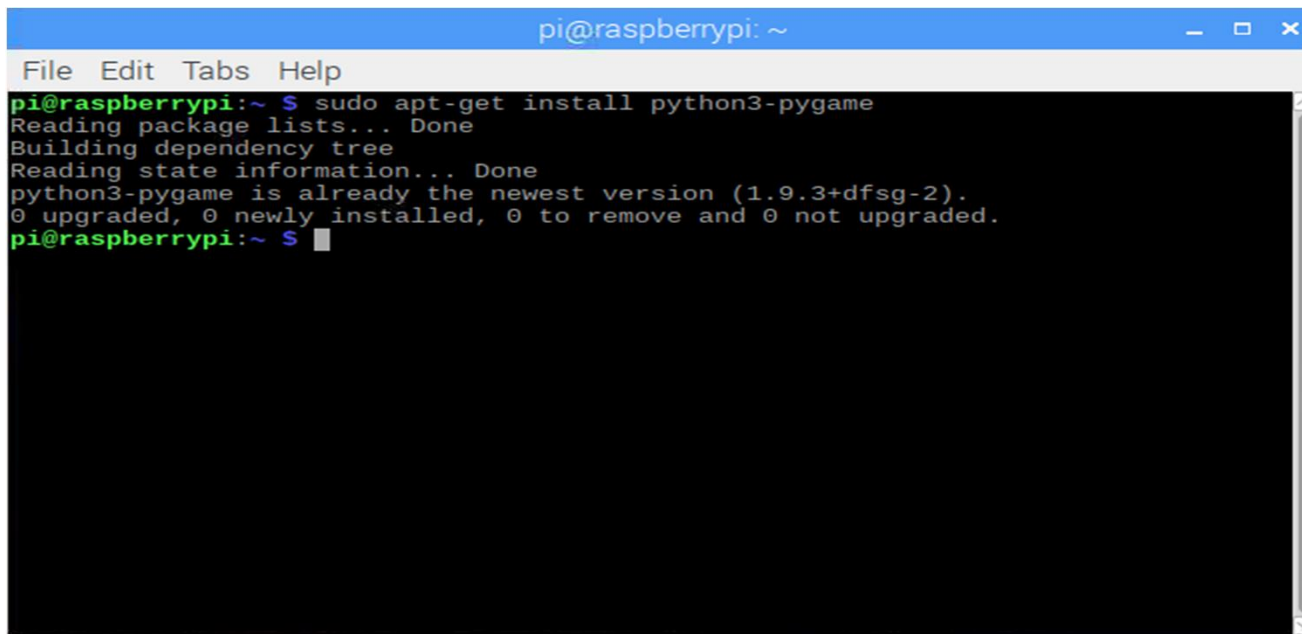
- <https://www.pygame.org>



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Install pygame

- `$ sudo apt-get install python3-pygame`



```
pi@raspberrypi: ~  
File Edit Tabs Help  
pi@raspberrypi:~ $ sudo apt-get install python3-pygame  
Reading package lists... Done  
Building dependency tree  
Reading state information... Done  
python3-pygame is already the newest version (1.9.3+dfsg-2).  
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.  
pi@raspberrypi:~ $
```



PyGame Event

Event Name	Event Property	Description
pygame.QUIT	none	게임 종료 버튼(창 닫기 버튼) 클릭 시 발생하거나 커맨드창에서 Ctrl + C를 입력하면 발생함
pygame.ACTIVEEVENT	gain, state	화면 활성화에 대한 이벤트로, 화면(GUI)에 마우스가 들어가거나 나가면 발생함 혹은 화면이 활성화 상태이면 발생함
pygame.KEYDOWN	unicode, key, mod	키보드를 누른 후 떼 때 발생함
pygame.KEYUP	key, mod	키보드를 누를 때 발생함
pygame.MOUSEMOTION	pos, rel, buttons	마우스가 움직일 때 발생함
pygame.MOUSEBUTTONUP	pos, button	마우스 버튼을 누른 후 떼 때 발생함
pygame.MOUSEBUTTONDOWN	pos, button	마우스 버튼을 눌렀을 때 발생함



Ex1 : Pygame

```
ExPygame.py
1  import pygame
2
3  black=(0,0,0)
4  pygame.init()
5  size=[340,270]
6  screen=pygame.display.set_mode(size)
7  pygame.display.set_caption("Ex Pygame")
8
9  gameExit=False
10
11 while not gameExit:
12     for event in pygame.event.get():
13         print (event)
14
15         if event.type==pygame.QUIT:
16             gameExit=True
17
18             screen.fill(black)
19             pygame.display.flip()
20
21 pygame.quit()
22 quit()
```



Ex1 : Run

Shell


```
<Event(4-MouseMotion {'pos': (134, 11), 'rel': (0, -2), 'buttons': (0, 0, 0)})>
<Event(4-MouseMotion {'pos': (134, 10), 'rel': (0, -1), 'buttons': (0, 0, 0)})>
<Event(4-MouseMotion {'pos': (134, 9), 'rel': (0, -1), 'buttons': (0, 0, 0)})>
<Event(4-MouseMotion {'pos': (134, 8), 'rel': (0, -1), 'buttons': (0, 0, 0)})>
<Event(4-MouseMotion {'pos': (134, 7), 'rel': (0, -1), 'buttons': (0, 0, 0)})>
<Event(4-MouseMotion {'pos': (134, 6), 'rel': (0, -1), 'buttons': (0, 0, 0)})>
<Event(4-MouseMotion {'pos': (134, 5), 'rel': (0, -1), 'buttons': (0, 0, 0)})>
<Event(4-MouseMotion {'pos': (134, 4), 'rel': (0, -1), 'buttons': (0, 0, 0)})>
<Event(4-MouseMotion {'pos': (134, 2), 'rel': (0, -2), 'buttons': (0, 0, 0)})>
<Event(4-MouseMotion {'pos': (134, 1), 'rel': (0, -1), 'buttons': (0, 0, 0)})>
<Event(1-ActiveEvent {'gain': 0, 'state': 1})>
<Event(1-ActiveEvent {'gain': 0, 'state': 2})>
<Event(1-ActiveEvent {'gain': 1, 'state': 2})>
<Event(1-ActiveEvent {'gain': 0, 'state': 2})>
<Event(1-ActiveEvent {'gain': 1, 'state': 2})>
<Event(1-ActiveEvent {'gain': 1, 'state': 1})>
<Event(4-MouseMotion {'pos': (31, 1), 'rel': (-103, 0), 'buttons': (0, 0, 0)})>
<Event(4-MouseMotion {'pos': (27, 3), 'rel': (-4, 2), 'buttons': (0, 0, 0)})>
<Event(4-MouseMotion {'pos': (25, 5), 'rel': (-2, 2), 'buttons': (0, 0, 0)})>
<Event(4-MouseMotion {'pos': (21, 8), 'rel': (-4, 3), 'buttons': (0, 0, 0)})>
<Event(4-MouseMotion {'pos': (18, 11), 'rel': (-3, 3), 'buttons': (0, 0, 0)})>
<Event(4-MouseMotion {'pos': (16, 13), 'rel': (-2, 2), 'buttons': (0, 0, 0)})>
<Event(4-MouseMotion {'pos': (11, 18), 'rel': (-5, 5), 'buttons': (0, 0, 0)})>
<Event(4-MouseMotion {'pos': (7, 21), 'rel': (-4, 3), 'buttons': (0, 0, 0)})>
<Event(4-MouseMotion {'pos': (2, 28), 'rel': (-5, 7), 'buttons': (0, 0, 0)})>
<Event(1-ActiveEvent {'gain': 0, 'state': 1})>
```

Ex Pygame



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Ex2 : Move

ExPygame2.py *

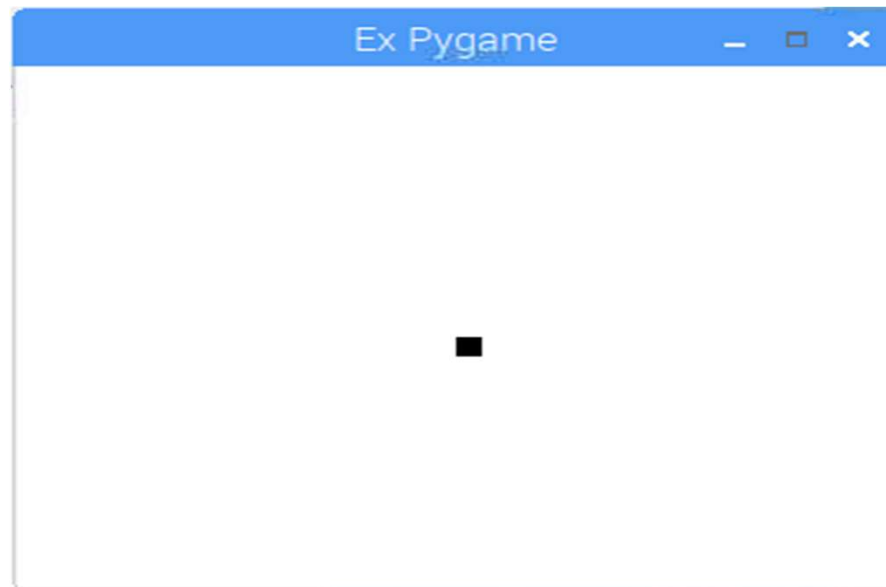
```
1 import pygame
2
3 black=(0,0,0)
4 white=(255,255,255)
5 pygame.init()
6 size=[340,270]
7 screen=pygame.display.set_mode(size)
8 pygame.display.set_caption("Ex Pygame")
9
10 gameExit=False
11 lead_X =50
12 lead_Y =50
13
```

```
14 while not gameExit:
15     for event in pygame.event.get():
16         print (event)
17
18         if event.type==pygame.QUIT:
19             gameExit=True
20         if event.type==pygame.KEYDOWN:
21             if event.key==pygame.K_LEFT:
22                 lead_X -=10
23             if event.key==pygame.K_RIGHT:
24                 lead_X +=10
25             if event.key==pygame.K_UP:
26                 lead_Y -=10
27             if event.key==pygame.K_DOWN:
28                 lead_Y +=10
29
30         screen.fill(white)
31         pygame.draw.rect(screen,black,[lead_X,lead_Y,10,10])
32         pygame.display.flip()
33
34 pygame.quit()
35 quit()
```

K_ESCAPE
K_s
K_q
K_x



Ex2 : Run



Font

- Font 설치 위치 : /usr/share/fonts
- Font List 확인 : \$ fc-list
- Font 형식 : ttf(true type font)

Bitmap



TrueType



ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
ghijklmnopqr
stuvwxyz2012
3456789.,“”“”“”



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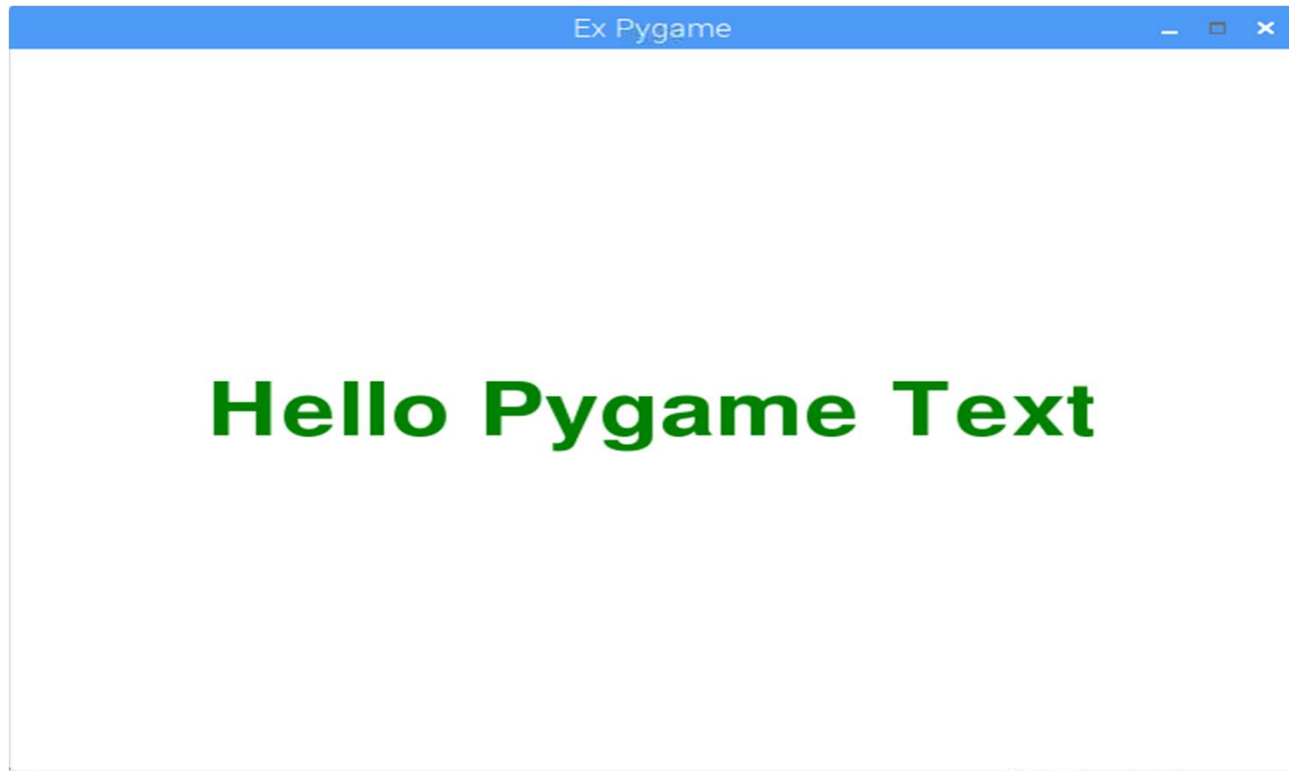
Ex3 : Font & Text

ExPygame3.py ✕

```
1  import pygame
2
3  black=(0,0,0)
4  white=(255,255,255)
5  blue=(0,0,255)
6
7  pygame.init()
8  size=[640,480]
9  screen=pygame.display.set_mode(size)
10 pygame.display.set_caption("Ex Pygame")
11
12 font=pygame.font.SysFont("comicsansms",72)
13 text=font.render("Hello Pygame Text",True,(0,128,0))
14
15 while True:
16     screen.fill(white)
17     screen.blit(text,(320-text.get_width()//2,240-text.get_height()//2))
18     pygame.display.flip()
19
```



Ex3 : Run



Time()

```
Python 3.5.3 Shell
File Edit Shell Debug Options Window Help
Python 3.5.3 (default, Sep 27 2018, 17:25:39)
[GCC 6.3.0 20170516] on linux
Type "copyright", "credits" or "license()" for more information.
>>> import datetime
>>> datetime.datetime.now()
datetime.datetime(2018, 10, 7, 21, 7, 39, 567277)
>>> datetime.datetime.now().time()
datetime.time(21, 8, 1, 368799)
>>> datetime.datetime.now().time().hour
21
>>> datetime.datetime.now().time().minute
8
>>> datetime.datetime.now().time().second
39
>>> from time import gmtime, strftime
>>> strftime("%H:%M:%S", gmtime())
'12:09:01'
>>> |
```

Ln: 18 Col: 4



Ex4 : Digital Clock

```
Digital_Clock.py ✕
1  import pygame
2  from time import gmtime, strftime
3
4  black=(0,0,0)
5  white=(255,255,255)
6  blue=(0,0,255)
7
8  pygame.init()
9  screen=pygame.display.set_mode((320,240))
10 pygame.display.set_caption("Digital Clock")
11 font=pygame.font.SysFont(None,72)
12
13 while True:
14     screen.fill(white)
15     currNow=strftime("%H:%M:%S",gmtime())
16     text=font.render(currNow,True,(0,128,0))
17
18     screen.blit(text,(160-text.get_width()//2,120-text.get_height()//2))
19     pygame.display.flip()
20
```

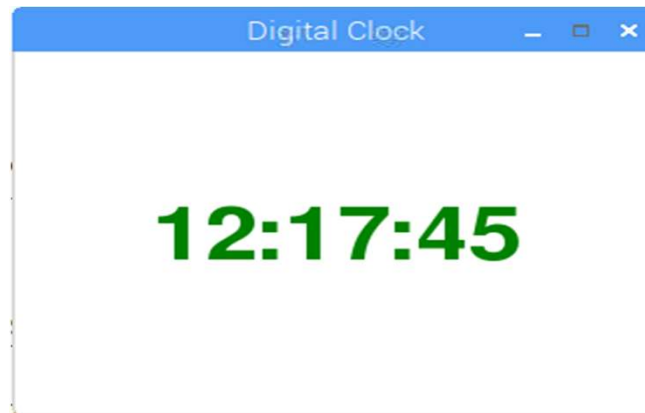
```
from time import localtime, strftime    #Local Time
```

```
Now=datetime.datetime().now()
currNow=Now.strftime("%H:%M:%S")
```



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Ex4 : Run



strftime()

기호	의미	출력 예(2001-02-03 04:05:06 기준)
%Y	년 (네 자리)	2001
%y	년 (두 자리)	01
%m	월 (두 자리)	02
%d	일 (두 자리)	03
%A	요일	Saturday
%H	시 (24시간)	04
%I	시 (12시간)	04
%p	오전, 오후	AM
%M	분 (두 자리)	05
%S	초 (두 자리)	06
%f	마이크로초	000000
%%	% 기호	%



Image

- File name : compass-3.png
- Image size : 320x320

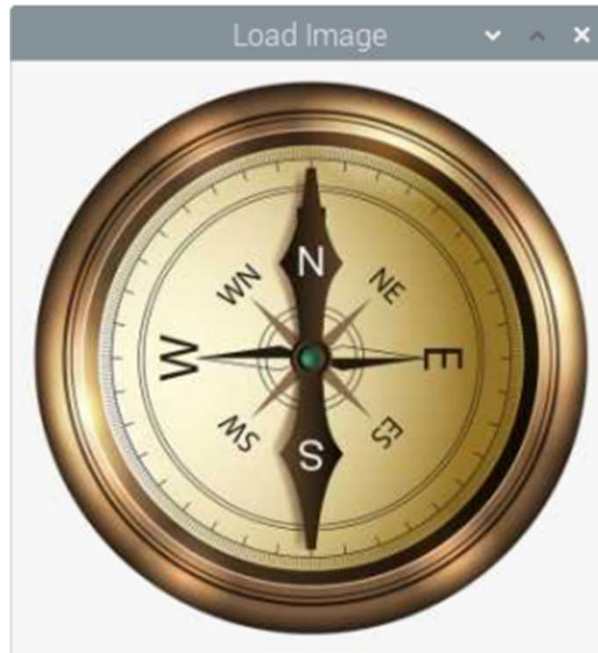


Ex5 : Image Load

```
1 import pygame
2
3 black=(0,0,0)
4 white=(255,255,255)
5 blue=(0,0,255)
6
7 pygame.init()
8 screen=pygame.display.set_mode((320,320))
9 pygame.display.set_caption("Load Image")
10 loadImage=pygame.image.load("compass-3.png").convert()
11 screen.fill(white)
12
13 while True:
14     screen.blit(loadImage,[0,0])
15     pygame.display.flip()
16
17 pygame.quit()
```



Ex5 : Run



Ex6 : Image Rotate

```
1 import pygame
2 from pygame.locals import *
3
4 white=(255,255,255)
5
6 pygame.init()
7 screen=pygame.display.set_mode((320,320))
8 pygame.display.set_caption("Load Image")
9 loadImage=pygame.image.load("compass-3.png").convert()
10 screen.fill(white)
11
12 degree=0
13 clock=pygame.time.Clock()
14 FPS=30
15
16 while True:
17     rotated=pygame.transform.rotate(loadImage,degree)
18     rect=rotated.get_rect()
19     rect.center=[160,160]
20     screen.blit(rotated,rect)
21     pygame.display.flip()
22     degree +=5
23     if degree>360:
24         degree=0
25     clock.tick(FPS)
26
27 pygame.quit()
```



Ex6 : Run

