



Graphics and user interaction

Installation and setup

To install, type `pip install pygame`.

Add pygame to your project:

```
import pygame, sys
pygame.init() # initialize the pygame system
size = (1000, 600) # window size is a 2-tuple measured in px
screen = pygame.display.set_mode(size)
```

The main loop

Pygame applications run in a neverending loop, which ends only when the user closes the window.

```
while True:
    # Quit when the user closes the window
    for event in pygame.event.get():
        if event.type == pygame.QUIT: sys.exit()

    screen.fill((255, 255, 255)) # RGB color tuple

    # ... Draw stuff

    pygame.display.flip() # Display what was drawn this turn
```

Basic abstraction: Surface

All graphic elements in pygame, including the screen itself, is a Surface.

You can draw surfaces on other surfaces using their `blit` method:

```
position = (60, 20) # (top, left) in pixels  
target.blit(source, position)
```

Read more about Surfaces at <http://www.pygame.org/docs/ref/surface.html>

Load an image

To load an image as a Surface, we use `pygame.image.load`:

```
tile = pygame.image.load("tile.png") # takes path to file
```

To draw the tile onto the screen Surface, you use `blit` in the main loop after clearing the screen.

```
screen.fill((255, 255, 255)) # clears the screen  
screen.blit(tile, (200, 100)) # put the tile image on screen
```

You can `blit` the same Surface onto the screen (and other Surfaces) multiple times.

Clock

Letting pygame run at MAX SPEED 🔥 🔥 can be costly on your CPU and battery life. You can limit the speed of the main loop using `pygame.time.Clock`:

```
clock = pygame.time.Clock()
max_fps = 60 # maximum number of cycles (frames) per second

while True:
    clock.tick(max_fps) # pauses for about 1/60 of a second
```

Example so far

See `pygame-demo.py`

Mouse events

Pygame records mouse actions in an event queue. We already used the QUIT event to see if the user closed the window. To capture mouse movement, check for the MOUSEMOTION event:

```
for event in pygame.event.get():
    if event.type == pygame.QUIT:
        # Quit when the user closes the window
        sys.exit()
    elif event.type == pygame.MOUSEMOTION:
        # Get mouse position whenever it moves
        mouse_position = event.pos # event.pos is a mouse position 2-tuple
```

For more about events see <http://www.pygame.org/docs/ref/event.html>