PYTHON: GAMES

PYGAME FRAMEWORK

```
$ pip install pygame
```

Game loop

Game loop

```python
while True:
```

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```python
while True:
    # are some keys pressed? has the mouse moved?
    handle_input(keys, mouse)
```
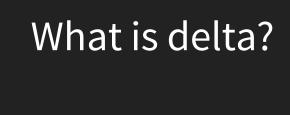
Game loop

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while True:
    # are some keys pressed? has the mouse moved?
    handle_input(keys, mouse)

    # move objects, check collisions, update physics
    for obj in objects:
        obj.update(delta)
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while True:
    # are some keys pressed? has the mouse moved?
    handle_input(keys, mouse)

    # move objects, check collisions, update physics
    for obj in objects:
        obj.update(delta)

    # render graphics to screen
    for obj in objects:
        obj.draw(screen)
```

What is delta?

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x += speed * delta
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# frame took 1/60 s -> small movement
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- adjustment for computer speed

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```

- adjustment for computer speed
- usually capped at 60 FPS

Rectangle

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```python
pos = (1, 1)  # points are represented as tuple (x, y)
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pos = (1, 1)  # points are represented as tuple (x, y)
size = (30, 30)
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pos = (1, 1)   # points are represented as tuple (x, y)
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```

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r = pygame.Rect(pos, size)
r.center = (50, 60)    # sets center to (50, 60)
```

Rectangle

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pos = (1, 1)  # points are represented as tuple (x, y)
size = (30, 30)
r = pygame.Rect(pos, size)
r.center = (50, 60)     # sets center to (50, 60)
moved = r.move(50, 30) # new rectangle at (x + 50, y + 30)
```

Drawing image to screen

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image = load_image('images/enemy1.gif')
```

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```

Drawing image to screen

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rect = image.get_rect() # image rectangle
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def draw(self, screen):
  screen.blit(image, rect)
```

Object groups

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```python
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enemies.update(p1, ...)  # update(p1, ...) on all enemies
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len(enemies)  # 1
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len(enemies)  # 1
enemy.kill()  # remove enemy from all collections
len(enemies)  # 0
```

Testing collisions

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```python
cols = pygame.sprite.spritecollide(player, enemies, False)
# `cols` now contains `enemies` that collide with `player`
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cols = pygame.sprite.spritecollide(player, enemies, False)
# `cols` now contains `enemies` that collide with `player`
if len(cols) > 0:
  for item in cols:
    item.kill()
```

Cooldown

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```python
cd = Cooldown(500) # CD for 500 ms
```

Cooldown

```python
cd = Cooldown(500) # CD for 500 ms

def update(self, engine, delta):
  cd.update(delta)
  if cd.reset_if_ready():
    # fire in the hole!
```

Pseudo-random generator

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Pseudo-random generator

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import random
r = random.Random()
r.random()          # random number between in range (0, 1)
r.randint(3, 5)     # random number in range [3, 5]
```

Pseudo-random generator

```python
import random
r = random.Random()
r.random()              # random number between in range (0, 1)
r.randint(3, 5)         # random number in range [3, 5]
r.choice([1, 2, 3])     # randomly selects an item from iterable
```