# CS Bridge, Lecture 15
# Breakout - Extra Features


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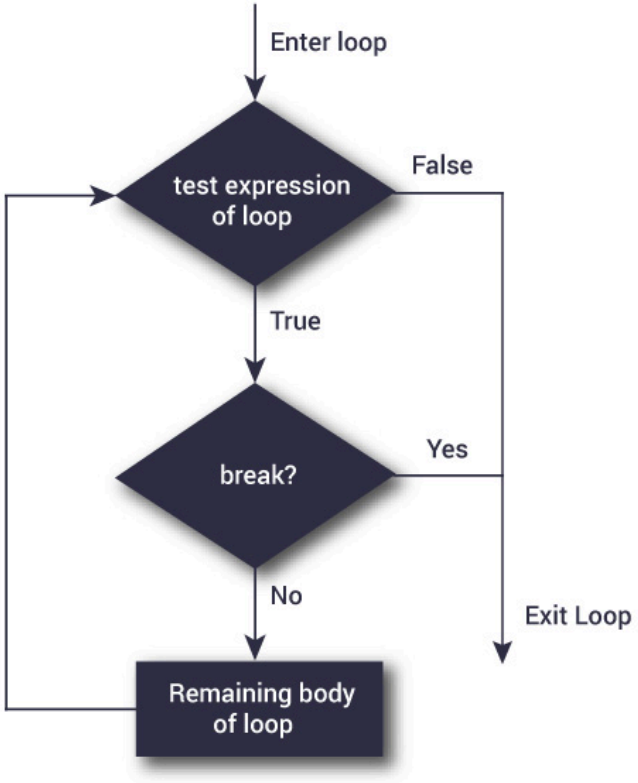
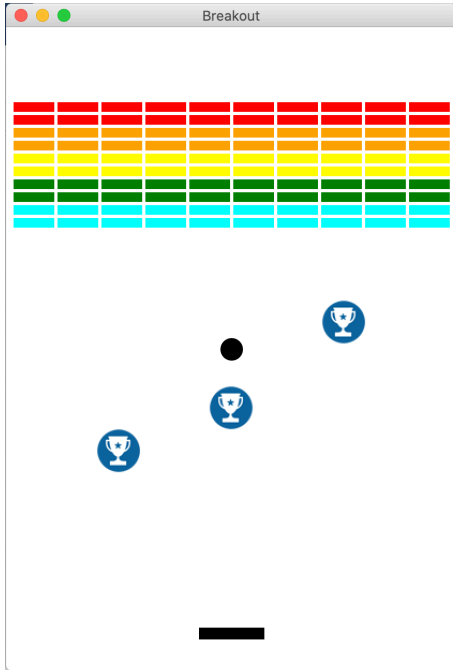
# Before we start, a few points to consider

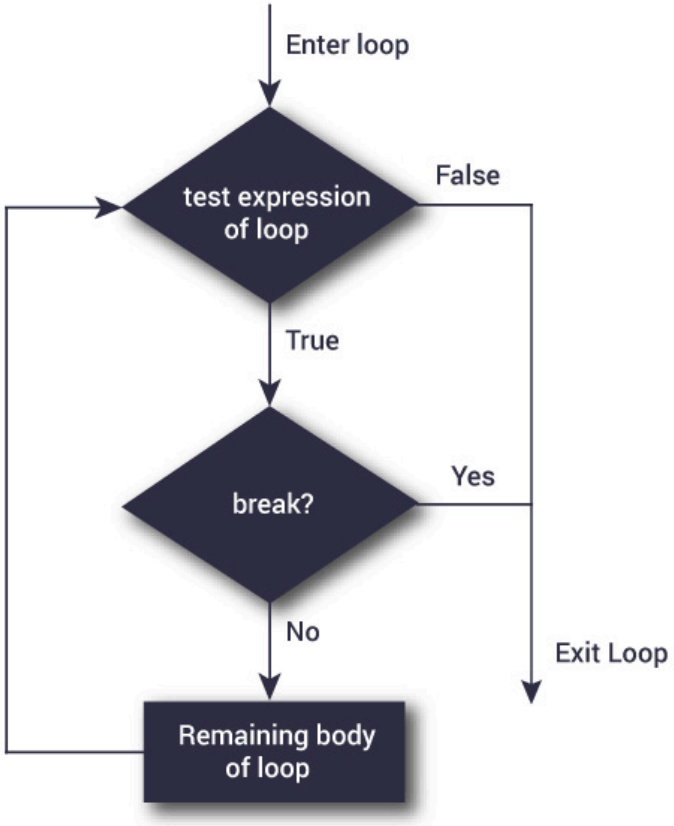
## Breaking a loop




## Creating a list of objects in a function and returning them



# Breaking a loop



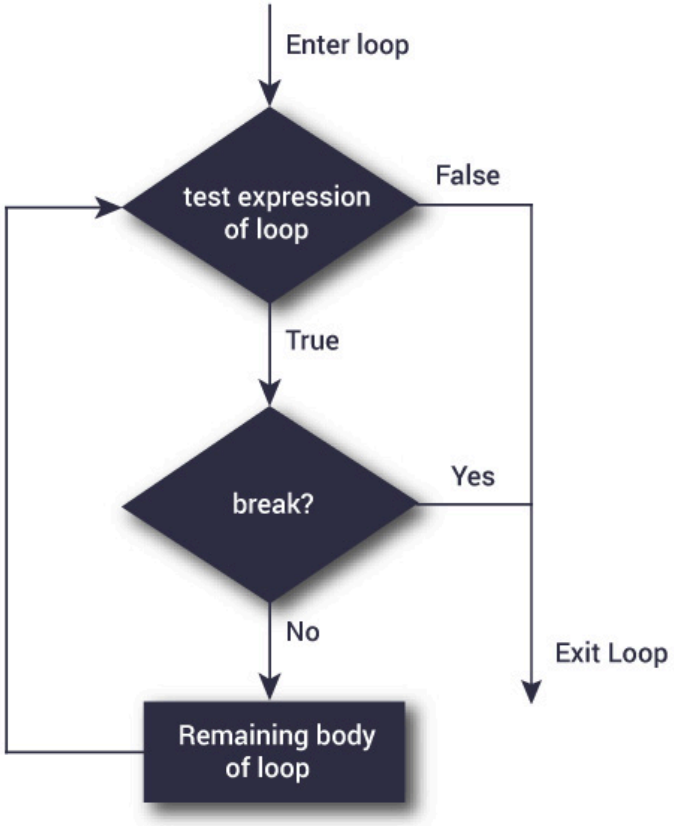

```
# A script that takes some time: check-prime
import time
start_time = time.time()
n = 151153234

is_prime = True
for i in range(2, n):
    if n % i == 0:
        is_prime = False

if is_prime:
    print("Is prime")
else:
    print("Is not prime")

print("--- {} seconds ---".format(time.time() - start_time))
```

**Better to stop the loop here**

**Output:**

```
Is not prime
--- 9.443579196929932 seconds ---
```

# Breaking a loop




```
# A script that takes some time: check-prime
import time
start_time = time.time()
n = 151153234

is_prime = True
for i in range(2, n):
    if n % i == 0:
        is_prime = False
        break
if is_prime:
    print("Is prime")
else:
    print("Is not prime")

print("--- {} seconds ---".format(time.time() - start_time))
```

We add a break statement

**Output:**

Is not prime

**--- 3.123283386230469e-05 seconds ---**

# Breaking an infinite loop

**Reading positive integers from a user:**

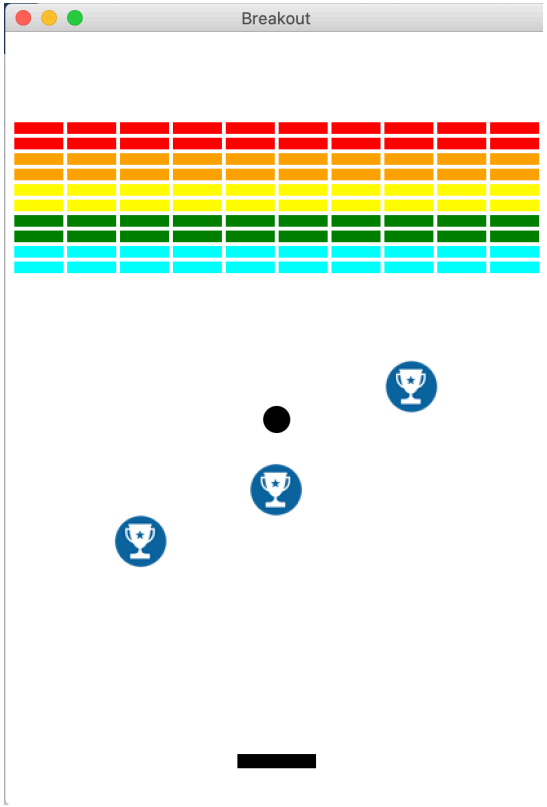
```
user_ints= []
value = int(input("Enter an integer:"))
while value > 0:
    user_ints.append(value)
    value = int(input("Enter an integer:"))
print("Your inputs:" + str(user_ints))
```

**Output:**
```
Enter an integer:1
Enter an integer:2
Enter an integer:3
Enter an integer:-8
Your inputs:[1, 2, 3]
```

```
user_ints= []
while True:
    value = int(input("Enter an integer:"))
    if value > 0:
        user_ints.append(value)
    else:
        break
print("Your inputs:" + str(user_ints))
```

**Output:**
```
Enter an integer:3
Enter an integer:2
Enter an integer:4
Enter an integer:5
Enter an integer:-7
Your inputs:[3, 2, 4, 5]
```

# Creating a list of objects in a function and returning them



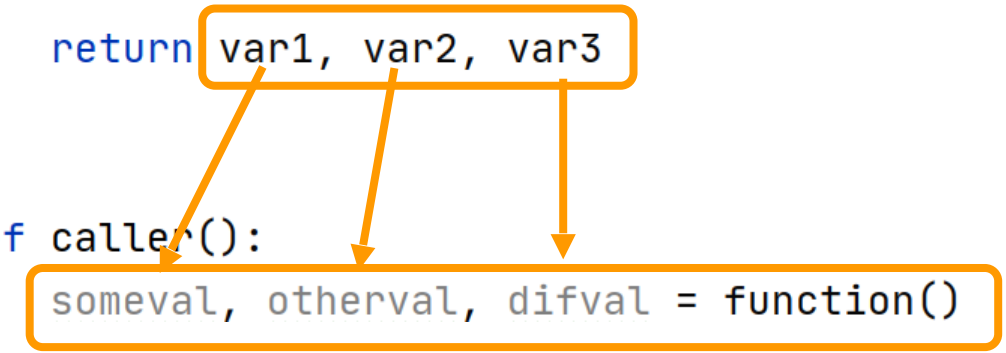
# Returning graphical objects from functions

```
# A function to create a single graphical object and return
def setup_graphical_object(canvas):
    object_x = … some expression to compute x …
    object_y = … some expression to compute x …
    my_object = canvas.create_….(object_x, object_y, object_x+SIZE, object_y+SIZE)
    return my_object
```

```
# A function to create multiple graphical objects, put those in a list and return the list of objects
def setup_graphical_objects(canvas):
    objects_list = []
    for i in range(NUM_OBJECTS):
        object_x = … some expression to compute x …
        object_y = … some expression to compute x …
        objects_list.append(canvas.create_….(object_x, object_y, object_x+SIZE, object_y+SIZE))
    return objects_list
```

# Returning multiple values from functions

```
def function():
    var1 = 3
    var2 = 5
    var3 = 17

    return var1, var2, var3


def caller():
    someval, otherval, difval = function()
```



# Extra Features for Breakout

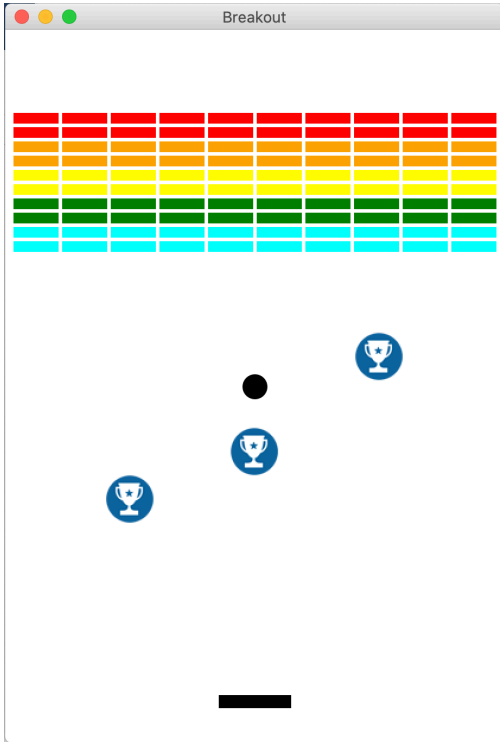
| | | | |
|---|---|---|---|
| Brick Breaker Heart Collector | 2021 | Windows | |
| Total Dark | 2020 | Windows | Garage Games |
| Arcanoid Breakout | 2020 | Macintosh, Nintendo Switch, Windows Apps, Xbox One | Pix Arts |
| Twin Breaker: A Sacred Symbols Adventure | 2020 | Nintendo Switch, PlayStation 4, PS Vita, Xbox One | Eastasiasoft Limited |
| Dungeonoid | 2020 | Nintendo Switch | Super Powerup Games S.L. |
| Immortal Wanna | 2019 | Windows | Duck Inc. |
| Hit the Light | 2019 | Android, iPad, iPhone | Happymagenta UAB |
| Hentai Block Breaker | 2019 | Windows | |
| Block Kuzushi II | 2019 | Windows | |
| Space Candy | 2019 | Windows | khukhrovr |
| Cute Blocks | 2019 | Windows | cBlck |
| !4RC4N01D! 2: Retro Edition | 2018 | Windows | armogames |
| Breakdown | 2018 | TRS-80 | PSKI Software Development, Inc. |
| Drawkanoid | 2018 | Macintosh, Windows | Humble Bundle, Inc. |
| !4RC4N01D! 4: KOHBEEP edition | 2018 | Windows | armogames |
| Voxel Baller | 2018 | Linux, Windows | MKD Games |
| Break Bricks: Ball's Quest | 2018 | iPad, iPhone | |
| Energy Invasion | 2018 | Linux, Macintosh, Nintendo Switch, PlayStation 4, PS Vita, Windows | Sometimes You |
| Briks 2 | 2018 | PlayStation 4 | SMobile, Inc |
| Deconstructor | 2018 | Linux, Macintosh, Windows | For Kids |
| !4RC4N01D! 3: Cold Space | 2018 | Windows | armogames |
| Ballz Royale | 2018 | Windows | Orlando |
| DX-Ball 2: 20th Anniversary Edition | 2018 | Windows | Longbow Games |
| !4RC4N01D! | 2018 | Windows | armogames |
| Nextoid! | 2018 | ZX Spectrum Next | |

https://www.mobygames.com/game-group/breakout-variants

# Extra Features for Breakout

# Collecting objects with paddle

```
def get_key_press(canvas):
    presses = canvas.get_new_key_presses()
    for press in presses:
        ....
    return ....
```

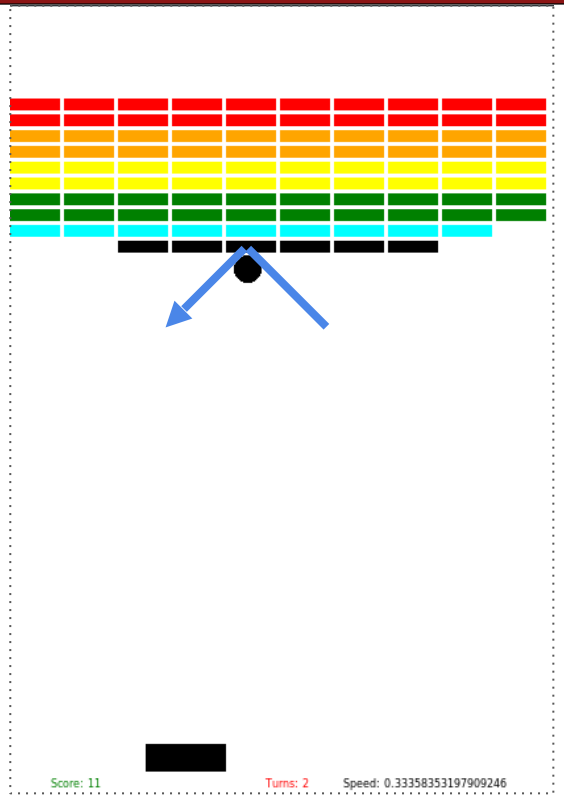



```
....
bullet = None

# animation loop
while turns > 0 and brick_count > 0:
    ...
    if bullet:
        canvas.move(bullet, 0, -BULLET_DX)
        if canvas.get_top_y(bullet) < 20:
            canvas.delete(bullet)
            bullet = None

...
```

# Extra Features for Breakout

## Special Bricks

**How would you implement that?**




Complete reference for class canvas: https://turkey21.csbridge.org/en/resources/api-docs/graphics.html

# Extra Features for Breakout

- Increasing speed
- User selected game level - difficulty control
- Cheats
- Showing score
- Tracking time
- Lives
- … any other suggestions?