Python i Pygame

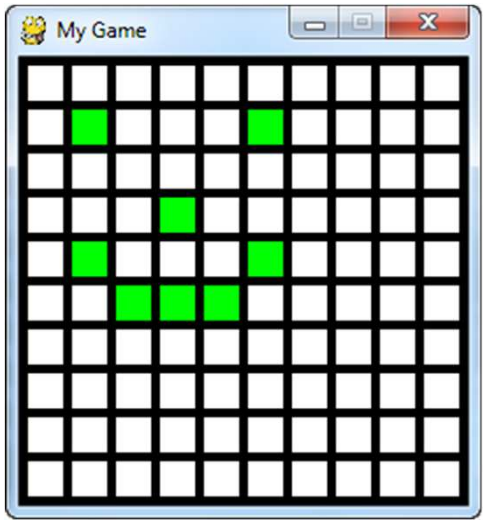
Programiranje arkadnih igrica u Pythonu koristeći Pygame

Polja

Polja u igricama

- U igricama se često koriste dvodimenzionalna polja (matrice) – npr. križić – kružić, minesweeper

- Za primjer ćemo napisati program "Mreža" koji će prikazati dvodimenzionalno polje bijelih kockica. Klikom miša ćemo moći obojati u zeleno onu kockicu iznad koje se nalazi miš



"Mreža", prije glavne petlje

- Postavi širinu i visinu kockice

```
# Postavi WIDTH and HEIGHT za svaku kockicu
WIDTH = 20
HEIGHT = 20
```

- Postavi razmak između kockica

```
# Postavi razmak izmedju kockica
MARGIN = 5
```

- Kreiraj matricu 10x10 i popuni ih kockicama bijele boje

```
# Kreiraj matricu koja sadrzi 10x10 kockica bijele boje
# 0 oznacava kockicu bijele a 1 zelene boje
grid = []
for row in range(10):
    # Dodaj prazan niz koji će sadržavati kockice u redu
    grid.append([])
    for column in range(10):
        # U prazan niz upisi po jednu nulu za svaki stupac
        grid[row].append(0)
```

- Kockicu u redu 2 i stupcu 6 postavi na zeleno

```
# Postavi razmak izmedju kockica
MARGIN = 5
```

"Mreža", glavna petlja

- Procitaj akciju igrača i označi da se kockica na koju je igrač kliknuo treba obojati u zeleno

```
for event in pygame.event.get():  # Uhvati akciju igraca
    if event.type == pygame.QUIT:  # Igrac je kliknuo na close
        done = True  # Oznaci da zavrsavamo petlju
    elif event.type == pygame.MOUSEBUTTONDOWN:
        # Igrac je kliknuo. Procitaj poziciju misa
        pos = pygame.mouse.get_pos()
        # Pretvori koordinate misa u kockice matrice
        column = pos[0] // (WIDTH + MARGIN)
        row = pos[1] // (HEIGHT + MARGIN)
        # Oznaci da se kockica treba obojati u zeleno
        grid[row][column] = 1
        # Ispisi na konzoli koodrinate misa i poziciju kockice u matrici
        print("Click ", pos, "Grid coordinates: ", row, column)
```

- Oboji ekran

```
# Oboji screen u crno
screen.fill(BLACK)
```

"Mreža", glavna petlja

- Procitaj akciju igrača i označi da se kockica na koju je igrač kliknuo treba obojati u zeleno

```
# Nacrtaj matricu
for row in range(10):
    for column in range(10):
        color = WHITE
        if grid[row][column] == 1:
            color = GREEN
            pygame.draw.rect(screen,
                             color,
                             [(MARGIN + WIDTH) * column + MARGIN,
                              (MARGIN + HEIGHT) * row + MARGIN,
                             WIDTH, HEIGHT])
```

Kviz

- Slijedi link ispod:

  http://programarcadegames.com/quiz/quiz.php?file=array_backed&lang=en

Kviz odgovori

- P1: In computer science, a grid of numbers is called a:
  - Bingo board
  - Two-dimensional board
  - One-dimensional array
  - Two-dimensional array

- P2: To print the value of the top left corner of a 10x10 two dimensional array, the current code would be:
  - print(my_array[0][0])
  - print(my_array[1,1])
  - print(my_array[0,0])
  - print(my_array[1][1])

Kviz odgovori, nastavak

- P3: To store a 10 into an x, y position on the grid of (0, 5), what is the correct code?
  - [0][5] = 10
  - print(my_arrayp[1,1])
  - my_array = 10
  - my_array[10] = (0,5)
  - my_array[0][5] = 10
  - my_array[5][0] = 10

- P4: To process an entire two-dimensional array, a program needs:
  - Two nested classes, one for each row, one for each element.
  - One for loop to process every element.
  - Two sequential for loops, one for each row, one for each element in the row.
  - A function for each element in the grid.
  - Two nested for loops, one for each row, one for each element in the row.

Kviz odgovori, nastavak

- P5: In the chapter example, how does the program find which grid location was clicked on with the mouse?
  - Divide the grid size by the x and y coordinates.
  - Subtract the grid size.
  - Divide coordinates by the size of each grid location (including the margin).
  - Subtract the margin, divide by grid size.