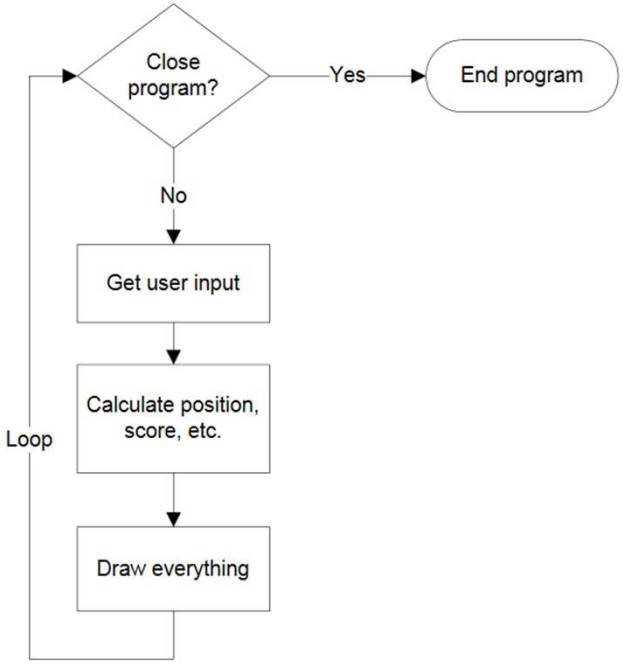
Python i Pygame

Programiranje arkadnih igrica u Pythonu koristeći Pygame

Slučajni brojevi i petlje

Petlje

- Koriste se za ponavljanje dijelova programa (blokova naredbi, koda)
- Kod igrica svaki frame koji se prikazuje čini jedan prolazak kroz petlju
- FPS (Frame Per Second) predstavlja broj ponavljanja u sekundi dijagrama toka kao što je na slici desno



- U Pythonu imamo dva osnovna tipa petlji
  - For petlja
  - While petlja

For petlja

- Kako se piše – sinaksa

```
for i in niz_vrijednosti:
    naredba ili blok naredbi
```

- Za generiranje niza vrijednosti se često koristi funkcija range(p, z, k)
  - i – indeks varijabla, ne treba biti definirana unaprijed
  - p – početna vrijednost petlje
  - z – završna vrijednost petlje, nije uključena u zadnji prolaz petlje
  - k – korak petlje

- For petlju koristimo kada znamo unaprijed koliko puta želimo ponoviti naredbu ili blok naredbi

For petlja primjeri

- Primjer 1: Ispis brojeva 0,1,2,3,4

```
for i in range(5):
    print(i)
```

- Primjer 2: Ispis brojeva 3,4,5

```
for i in range(3,6):
    print(i)
```

- Primjer 3: Ispis brojeva 3,5,7

```
for i in range(3,8,2):
    print(i)
```

- Primjer 4: Ispis brojeva 5,4,3,2,1

```
for i in range(5,0,-1):
    print(i)
```

For petlja unutar petlje

- Primjer:

```
for i in range(2):
    print("a")
    for j in range(2):
        print("b")
print("Done")
```

- Ispis:

```
a
b
b
a
b
b
Done
```

While petlja

- Kako se piše – sinaksa

```
while uvjet:
    naredba ili blok naredbi
```

- Dok je uvjet ispunjen, ponavlja se naredba ili blok naredbi

- While petlju koristimo kada ne znamo unaprijed koliko puta želimo ponoviti naredbu ili blok naredbi

While petlja primjer

- Ispis brojeva od 0 do 9

- ```
  for i in range(10):
      print(i)

  i = 0
  while i < 10:
      print(i)
      i =i + 1
  ```

- Napomena:
  `i = i + 1`
  se može napisati kao
  `i += 1`
  ```

Slučajni brojevi

- Za generiranje slučajnih brojeva koriste se funkcije iz biblioteke random
  - random.randrange(x, y) – generira slučajni cijeli broj iz raspona od x do y
  - random.random() – generira slučajni realni broj iz raspona od 0 do 1

- Primjer 1: slučajni cijeli broj od 0 do 49

```
import random
broj = random.radrange(50)
```

- Primjer 2: slučajni realni broj između 10 i 15

```
import random
broj = random.random()*5 + 10
```

Kviz

- P1: What does this code print?

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

Kviz odgovori

- P1: What does this code print?

```
for x in range(4):
    print("Hello")
```

  - The word Hello 5 times
  - It will print Hello forever
  - The word Hello 3 tmes
  - Nothing, it won't run
  - The word Hello 4 times

- P2: What does this code print?

```
for y in range(4):
print("y")
```

  - The numbers 0 to 4
  - The numbers 1 to 4
  - The numbers 0 to 3
  - The numbers 1 to 3
  - It will print "y" four times

Kviz odgovori, nastavak

- P3: What does this code print?

```
for y in range(4):
    print(y)
```

  - The numbers 1 to 4
  - Nothing, it won't run
  - The numbers 0 to 3
  - The numbers 0 to 4
  - The numbers 1 to 3

- P4: What does this code print?

```
for y in range(1, 11):
    print(y)
```

  - The numbers 0 to 10
  - Nothing, it won't run
  - The numbers 1 to 11
  - The numbers 0 to 11
  - The numbers 1 to 10

Kviz odgovori, nastavak

- P5: What does this code print?

```
for y in range(2, 12, 2):
    print(y + 1)
```

  - The even numbers 2 to 10
  - Nothing, it won't run
  - The odd numbers 3 to 11
  - The even numbers 2 to 12
  - The odd numbers 3 to 13

- P6: What does this code print?

```
a=0
for i in range(10):
    a += 1
print(a)
```

  - 9
  - Nothing, it won't run
  - 11
  - 10

Kviz odgovori, nastavak

- P7: What does this code print?

```
a = 0
for i in range(10):
    a += 1
for j in range(10):
    a += 1
print(a)
```

  - Nothing, it won't run
  - 20
  - 18
  - 100
  - 10

- P8: What does this code print?

```
a = 0
for i in range(10):
    for j in range(10):
        a += 1
print(a)
```

  - 100
  - 110
  - Nothing, it won't run
  - 10
  - 20

Kviz odgovori, nastavak

- P9: What does this code print?

```
a = 0
for i in range(10):
    a += 1
    for j in range(10):
        a += 1
print(a)
```

  - 20
  - 10
  - 100
  - Nothing, it won't run
  - 110

- P10: When should a programmer use a for loop instead of a while loop?
  - while loops should always be used
  - for loops are used to loop until a condition is true
  - for loops should always be used
  - for loops are used to when there is a set number of loops

Kviz odgovori, nastavak

- P11: What does this do?

```
x = random.randrange(50)
```

  - A random integer 1 to 49 (inclusive)
  - A random integer 1 to 50 (inclusive)
  - The number 50
  - A random integer 0 to 50 (inclusive)
  - A random integer 0 to 49 (inclusive)

- P12: What does this do?

```
x = random.randrange(1, 50)
```

  - The number 50
  - A random integer 1 to 49 (inclusive)
  - A random integer 0 to 49 (inclusive)
  - A random integer 1 to 50 (inclusive)
  - A random integer 0 to 50 (inclusive)

Kviz odgovori, nastavak

- P13: What does this do?

```
x = random.random()*10
```

  - A random integer from 0 to 10
  - A random floating point number from 0 to 10
  - A random integer from 0 to 9
  - A random integer from 0 to 1

Za vježbu

- Ispisati prvih 10 parnih brojeva
- Rješenje:

```
for i in range(2, 22, 2):
    print(i)
```

- Napisati program koji će korisniku dati mogućnost pogađanja lozinke. Mogućnost pogađanja lozinke izvršavati će se toliko puta dok korisnik ne pogodi lozinku. Kada korisnik pogodi lozinku, ispisati „upisali ste tocnu lozinku“ u suprotnom javiti vijest o pogrešno upisanojlozinci i ponoviti unos.
- Rješenje:

```
password = ""
while password != "1234":
    password = input("Uniesite lozinku: ")
    if password == "1234":
        print("Upisali ste ispravnu lozinku.")
    else:
        print("Upisali ste pogresnu lozinku, pokusajte ponovo.")
```