



Programiranjem do igre, igrom do programiranja

Informatički klub FUTURA
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Programski jezik Scratch

<http://scratch.mit.edu>

Create stories, games, and animations
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Programski jezik Scratch

- U programskom jeziku SCRATCH moguće je programirati i pokretati programe koristeći samo web preglednik
- Međutim, za razvoj programa bolje je instalirati *offline editor*.

<http://scratch.mit.edu/scratch2download/>

Potrebno je pritisnuti INSTALL NOW i slijediti upute.

Napomena: na računalima u ovoj učionici već je instaliran *offline editor* - zato je ovo uputa kako ćete to napraviti kod kuće!

Programski jezik Scratch

- **Scratch** je besplatni programski alat koji omogućuje djeci (i odraslima) stvaranje igara, animiranih priča i interaktivne umjetnosti.
- Vlastite kreacije moguće je jednostavno podijeliti s drugima preko interneta.
- **Scratch** je razvila grupa [Lifelong Kindergarten](#) (“cjeloživotni vrtić”) koja je dio [MIT Media Lab](#), u suradnji s [KIDS research group](#) s UCLA Graduate School of Education & Information Studies.

MIT => Massachusetts Institute of Technology je privatno istraživačko sveučilište u američkom gradu Cambridge, država Massachusetts. Usput, MIT je dao 63 dobitnika Nobelove nagrade 😊

Programski jezik Scratch

- Središnji dio svakog Scratch programa su **likovi** (*sprites*). Svaki lik ima vlastito ponašanje opisano naredbama (blokovima) programskog jezika koje su organizirane u skripte. Skripte za više likova mogu se paralelno izvoditi.



- Likovi mogu komunicirati s korisnikom računala ili međusobno.
- Izgled lika može se mijenjati promjenom **kostima** (*costume*).
- Radnja se događa na **pozornici** (širine 480, a visine 360 jedinica). U središtu pozornice vrijednosti koordinata x i y su nula.

Programski jezik Scratch

- Primjer s dva lika koji se ispričavaju kad se sudare 😊

1

The screenshot shows the Scratch 2 Offline Editor interface. The stage displays a cat sprite on the left and a butterfly sprite on the right, with a blue crosshair indicating their relative positions. The sprites panel at the bottom shows the cat as 'Sprite1' and the butterfly as 'Butterfly3'. The scripts area on the right contains the following code blocks for the butterfly:

```

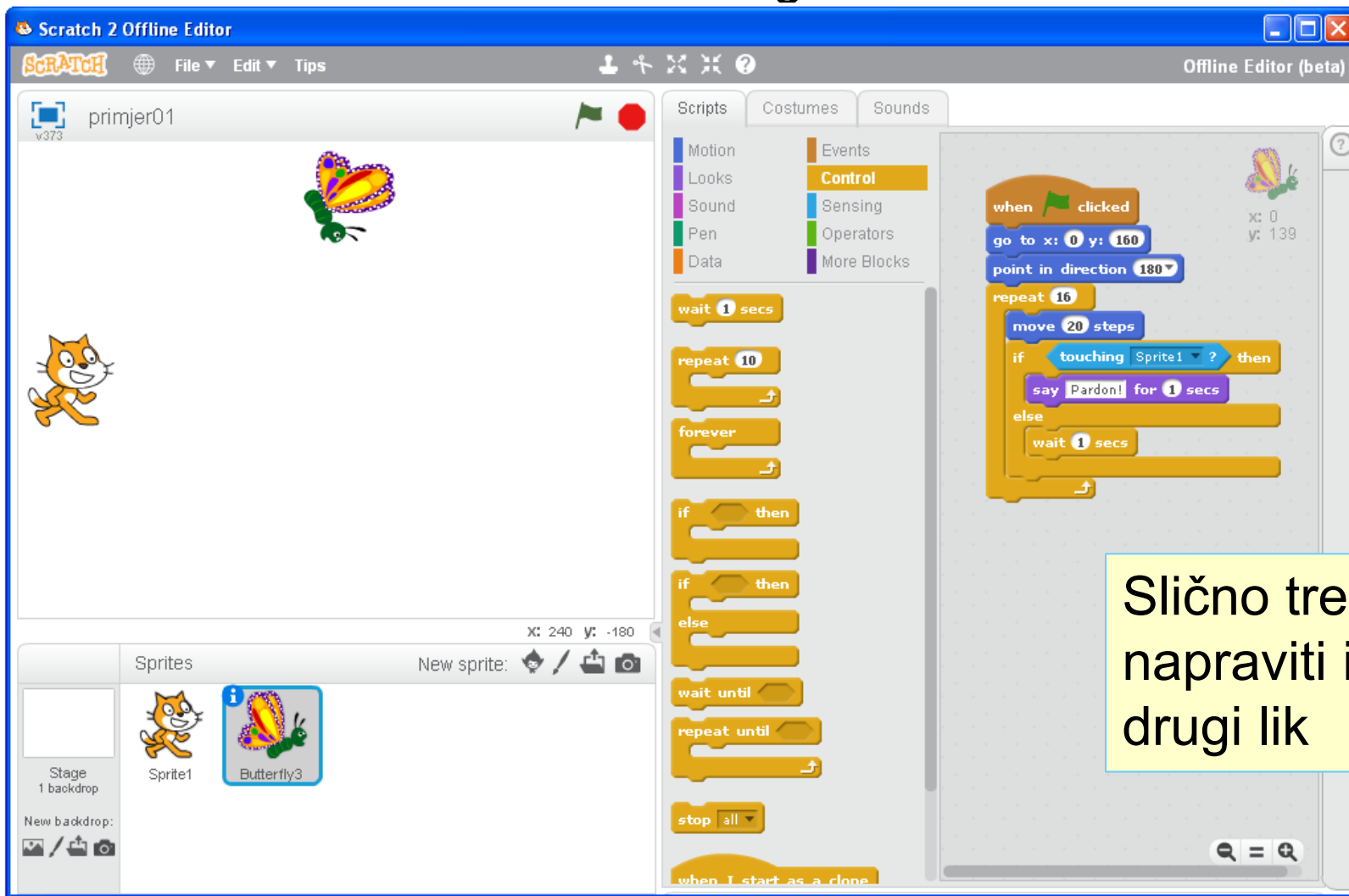
when green flag clicked
  go to x: -200 y: 0
  point in direction 90
  repeat 20
    wait 1 secs
    move 20 steps
  
```

A yellow callout box on the right side of the editor contains the text: "Slično treba napraviti i za drugi lik".

Programski jezik Scratch

- Možemo kontrolirati što se događa kad se likovi dodirnu

2



The screenshot shows the Scratch 2 Offline Editor interface. The main stage displays a butterfly sprite and the Scratch cat. The Scripts menu is open, showing a script for the butterfly sprite. The script starts with 'when green flag clicked', followed by 'go to x: 0 y: 160', 'point in direction 180', and a 'repeat 16' loop. Inside the loop, there is a 'move 20 steps' block, an 'if touching Sprite1?' block, and a 'say Pardon! for 1 secs' block. The 'else' block contains a 'wait 1 secs' block. The bottom panel shows the Sprites area with 'Sprite1' and 'Butterfly3'.

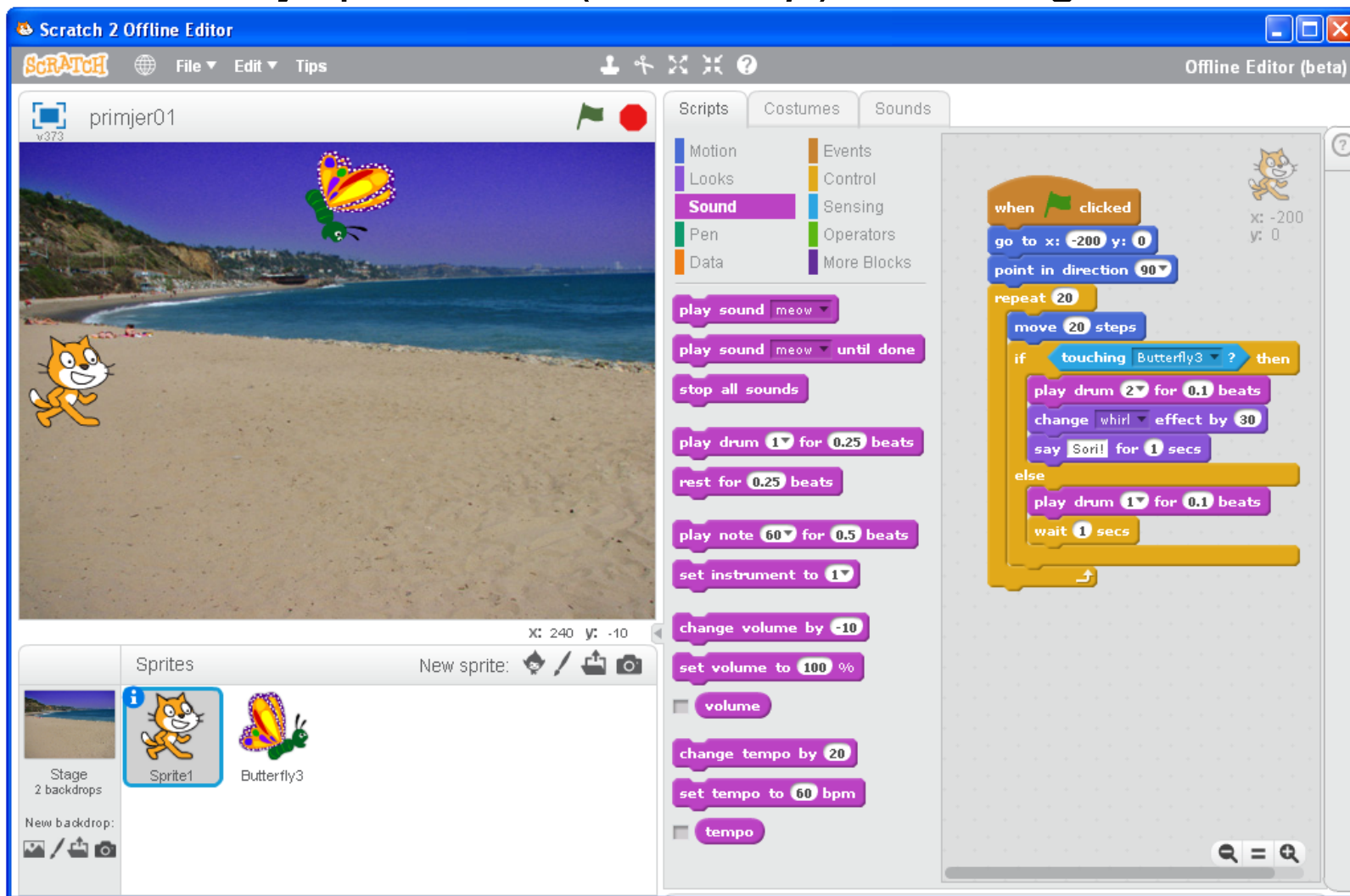
```
when green flag clicked
go to x: 0 y: 160
point in direction 180
repeat 16
  move 20 steps
  if touching Sprite1? then
    say Pardon! for 1 secs
  else
    wait 1 secs
```

Slično treba napraviti i za drugi lik

Programski jezik Scratch

- Dodavanje pozadine (*backdrop*), zvuka i grafičkih efekata

3



Scratch 2 Offline Editor

primjer01

Scripts

- Motion
- Looks
- Sound**
- Pen
- Data
- Events
- Control
- Sensing
- Operators
- More Blocks

```

when green flag clicked
  go to x: -200 y: 0
  point in direction 90
  repeat 20
    move 20 steps
    if touching Butterfly3? then
      play drum 2 for 0.1 beats
      change whirl effect by 30
      say Sori! for 1 secs
    else
      play drum 1 for 0.1 beats
      wait 1 secs
  
```

change volume by -10

set volume to 100 %

change tempo by 20

set tempo to 60 bpm

Sprites

New sprite:

Stage
2 backdrops

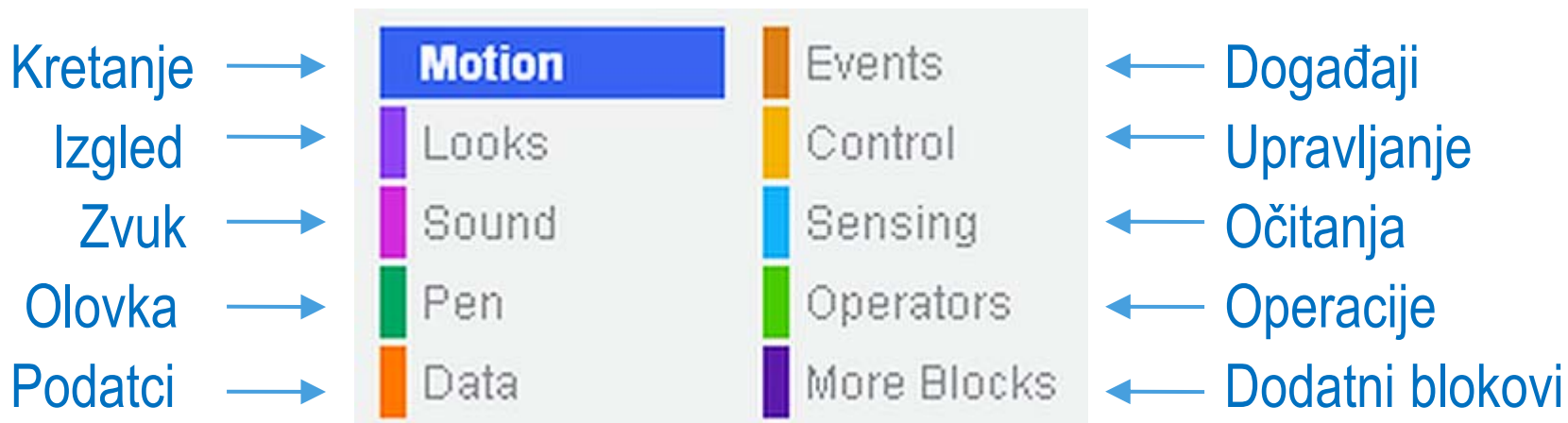
New backdrop:

Sprite1

Butterfly3

Programski jezik Scratch

- Scratch programi (skripte) sastoje se od predefiniranih blokova.
- Blokovi su organizirani u 10 grupa:



Učinak većine blokova se može jednostavno testirati tako da se klikne na odgovarajući blok.



Igra

Scratch 2 Offline Editor

mandzukic

File Edit Tips About

Offline Editor (beta)

Scripts Costumes Sounds

Motion

- Looks
- Sound
- Pen
- Data

Events

- Control
- Sensing
- Operators
- More Blocks

when green flag clicked

- go to x: 200 y: 200
- clear graphic effects
- point in direction 180
- switch costume to shark-b
- set boja to 0
- set korak to 5
- forever
 - move korak steps
 - if touching edge? then
 - set korak to pick random 2 to 10
 - if on edge, bounce
 - if touching Soccer Ball? then
 - change boja by 4
 - set color effect to boja
 - play sound pop
 - if boja > 70 then
 - switch costume to shark-c
 - broadcast bravo

- move 10 steps
- turn 15 degrees
- turn 15 degrees
- point in direction 90
- point towards
- go to x: 200 y: 127
- go to mouse-pointer
- glide 1 secs to x: 200 y: 127
- change x by 10
- set x to 0
- change y by 10
- set y to 0

X: 145 Y: 180

Sprites

New sprite:

- Shark
- Fish1
- mandzuki...
- Soccer Ball
- Zrak

Stage 2 backdrops

New backdrop:

Nagradni natječaj

- **Do Božića (25.12.)** napraviti u Scratchu animiranu čestitku za Božić ili Novu godinu.
- Nastojati da čestitka nekako bude povezana s našim gradom ili krajem.
- Čestitku u obliku **sb2** Scratch datoteke poslati na mail unidu.prog@gmail.com
- Povjerenstvo će ocijeniti uradke i **nagraditi autora najbolje čestitke!**