Faculty of Mathematics and Physics
Charles University in Prague
20th April 2015

C# Made Easy!

Programming II

Workshop 09 – GDI+

Workshop 09
Outline

1. Test
2. Fun with Graphics!
3. Homework

Test 09
Test

Find the test here (no-ads):

http://goo.gl/fdJVgZ

Permanent link:

https://docs.google.com/forms/d/1rzaYggXx9hEuLjAPvHBS7fudw1hqGhwaKrqVaUed23w/viewform

Time for the test:

15 min
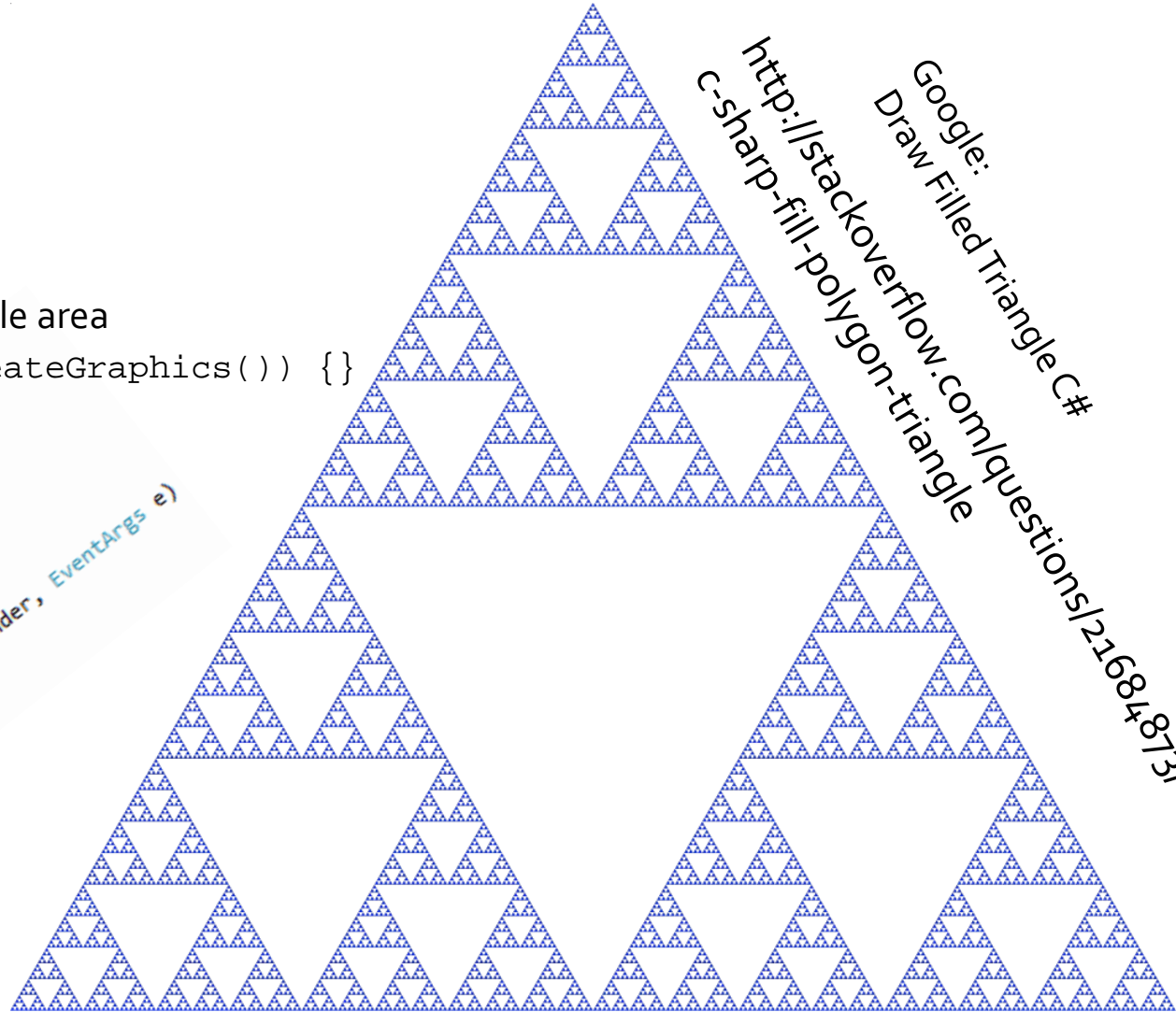
- Let's draw this beast!

- **Good to know**
  - `Form.ClientSize`
    - Determining drawable area
  - `Using (g = this.CreateGraphics()) {}`
  - `Form.ResizeEnd` event
  - Polygon drawing

```
1 reference
public Form1()
{
    InitializeComponent();
    this.ResizeEnd += ResizeEnd_Event;
}

1 reference
private void ResizeEnd_Event(object sender, EventArgs e)
{
}
```

Google:
Draw Filled Triangle C#
http://stackoverflow.com/questions/21684873/
c-sharp-fill-polygon-triangle

Task 09.1 (or Homework)
Sierpinsky Triangle

- Redraw on screen resize (full width + height)
- Provide edit box that allows to set the "recursion step"
  - Watch out for exceptions! *[You shall not fail!]*
  - https://msdn.microsoft.com/en-us/library/b3h1hf19%28v=vs.110%29.aspx
- Provide color picker box to select the triangle color
  - Google: `ColorDialog`

- 5 points

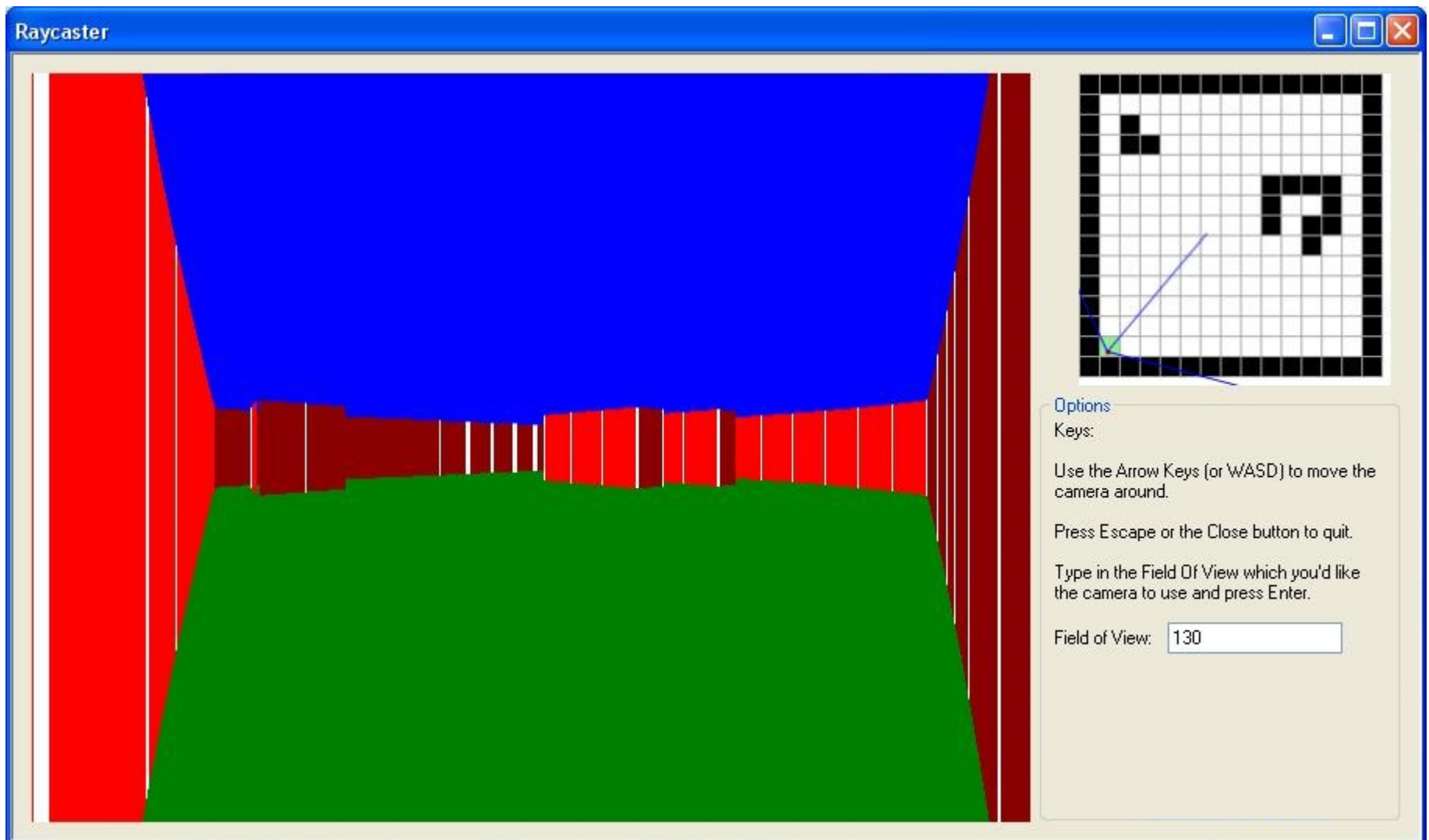- Deadline: 26.4.2015 23:59
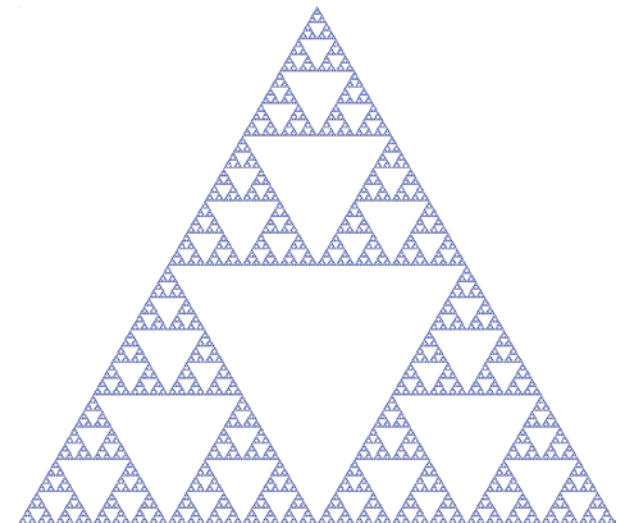
Task 09.2 (or Homework)
Get ready…
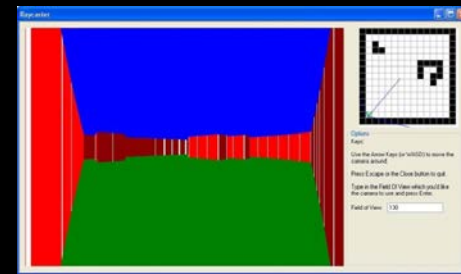
- This is going to be huge ☺

Task 09.2 (or Homework)
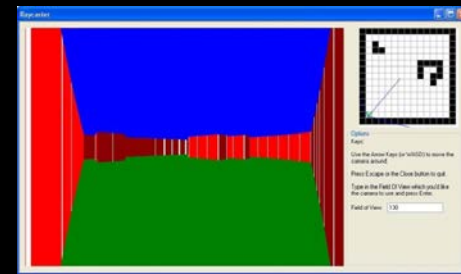## 3D Engine!

Task 09.2 (or Homework)
3D Engine!

- Don't get scared!
- Can be written in about 300 lines!

- http://goo.gl/QbcSto
  - Permalink:
  - http://www.playfuljs.com/a-first-person-engine-in-265-lines/

- Input file:
  ```
  NxN
  <maze>
  ```

- **20+5 bonus points**

- Example
  ```
  10x6
  ##########
  #........#
  ####.###.#
  #..#.#.#.#
  #........#
  ##########
  ```

- On Event (button clicked / resize):
  - `//DrawSky()    // optional`
  - `//DrawFloor() // optional`
  - `DrawWalls()`

- Drawing walls will need
  - `double Raycast(x, y, angle, max)`
    - `[x;y]` where we're casting the ray from
    - `angle` (horizontal) we're throwing the ray in
    - `max` – limiting raycasting length
    - Returns distance to the wall or (-1) if the wall not hit in "maxDistance"
    - Can be done by various algorithms

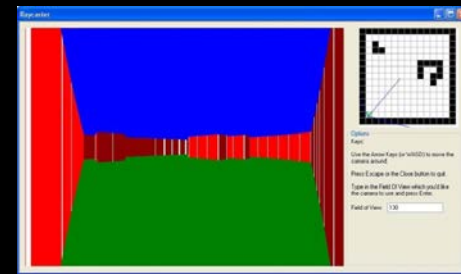http://lodev.org/cgtutor/raycasting.html
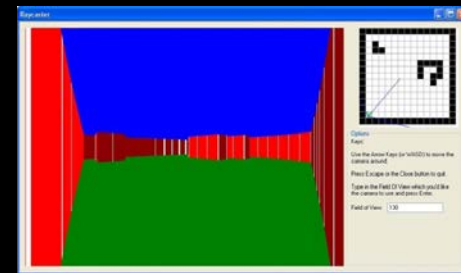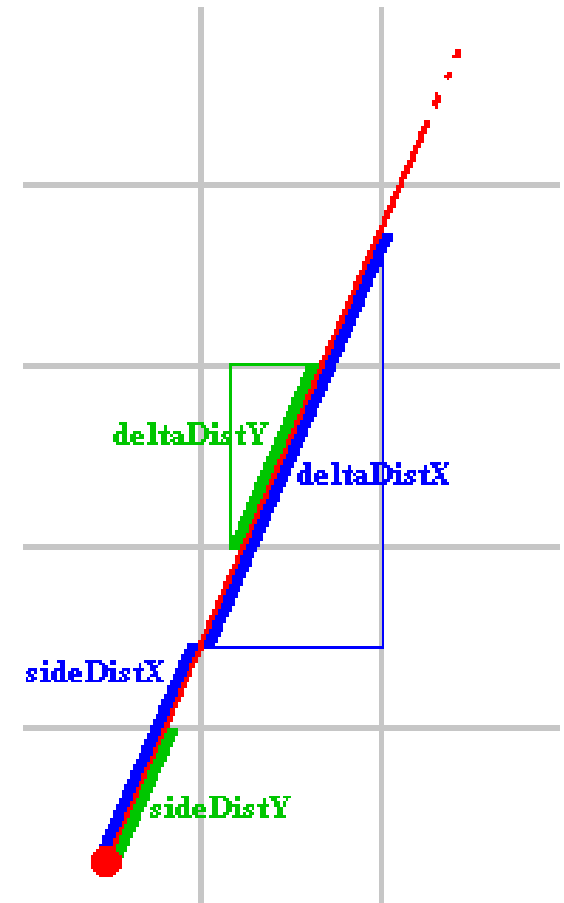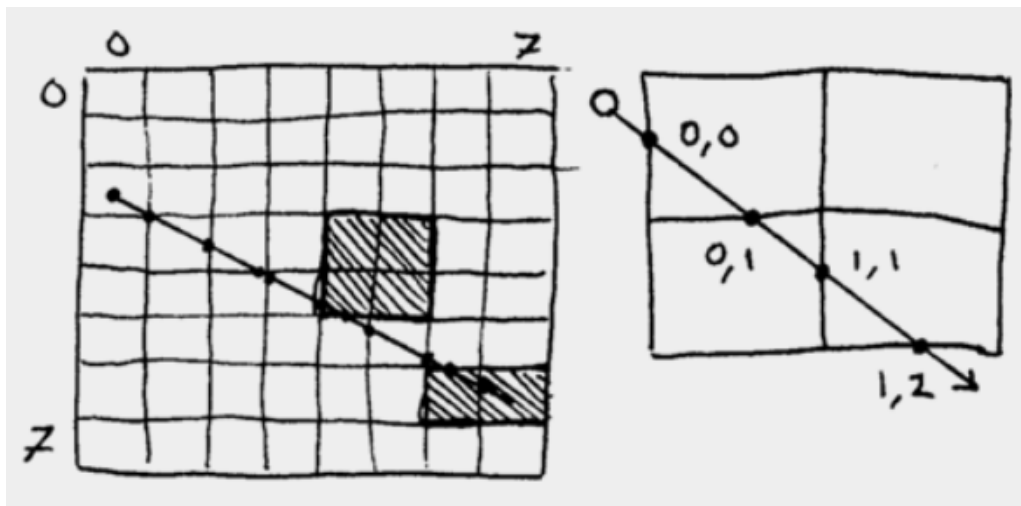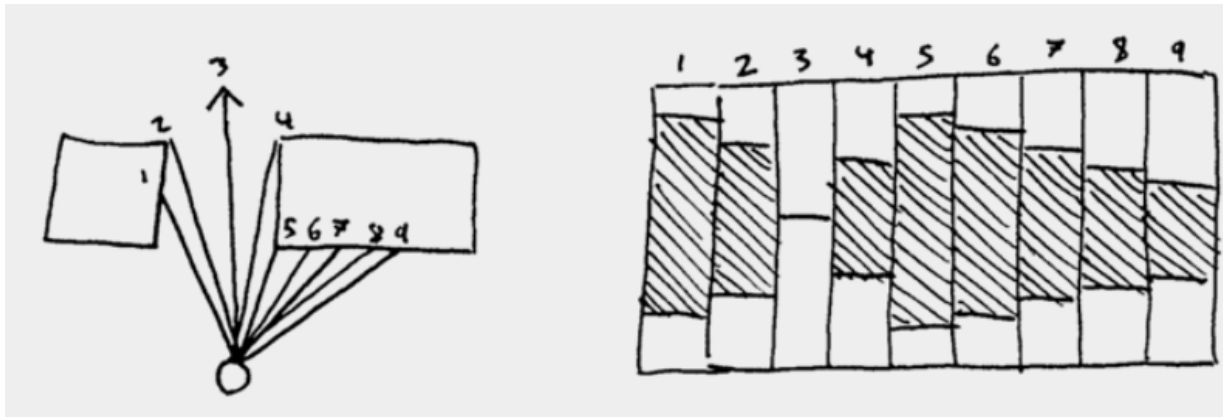
Task 09.2 (or Homework)
3D Engine

- Different colors for different wall sides
- Redraw on screen resize
- Provide buttons for Movement (turn left/right, move forward/backward)
- Provide color picker for walls
- Provide a way for changing FOV
- Provide a way for disabling "fish-eye" correction

- 30 points

- Bonus section
  - Provide movement through keyboard (WSAD)
    - 5 bonus points
  - Do not cross walls
    - 5 bonus points
  - Draw sky + floor + provide color pickers for them
    - 5 bonus points

- Deadline: 10.5.2015 23:59

Assignment 09.1 / 09.2
Send me an email

- Email: jakub.gemrot@gmail.com

- Subject: **Programming II – 2015 – Assignment 09.1/09.2**

- Zip up the whole project and send it

- You WILL NOT find the assignment in CoDex!

- Deadline:
  - **09.1: 26.4.2015 23:59**
  - **09.2: 10.5.2015 23:59**

Questions?
I sense a soul in search of answers...

- Sadly, I do not own the patent for perfection (and will never do)

- In case of doubts about the assignment or some other problems don't hesitate to contact me!

  - Jakub Gemrot

    - gemrot@gamedev.cuni.cz