

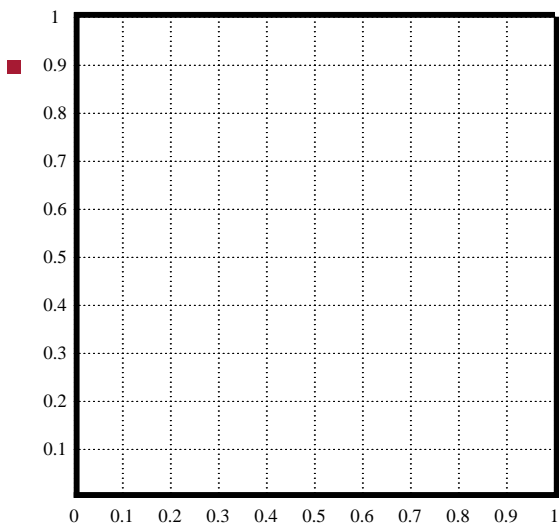
## Tutorial 13

- during this tutorial we will
  - understand the PGE API
  - create a small snooker game using PGE
  - understand how PGE integrates with PyGame

## Using PGE to create a game

- full documentation about PGE is [available](http://floppsie.comp.glam.ac.uk/Glamorgan/gaius/pge/homepage.html)  
(<http://floppsie.comp.glam.ac.uk/Glamorgan/gaius/pge/homepage.html>)
- any PGE game or simulation must fix a board frame around our universe

## Using PGE to create a game



## Framing the universe in PGE

- ```
def placeBoarders (thickness, color):
    bottom = pge.box (0.0, 0.0, 1.0, thickness, color).fix
    left = pge.box (0.0, 0.0, thickness, 1.0, color).fix
    right = pge.box (1.0-thickness, 0.0, thickness, 1.0,
                    .fix ()
    top = pge.box (0.0, 1.0-thickness, 1.0, thickness, color).fix
    return [bottom, left, right, top]
```

- which can be invoked by:

- ```
sides = placeBoarders (0.01, brown)
```

## Run breakout

- examine the [breakout game source code](http://floppsie.comp.glam.ac.uk/Glamorgan/gaius/pge/example_games.html) ([http://floppsie.comp.glam.ac.uk/Glamorgan/gaius/pge/example\\_games.html](http://floppsie.comp.glam.ac.uk/Glamorgan/gaius/pge/example_games.html))
  - take a copy of this code and run it from the command line using the Python interpreter
- read the code and mentally make a note about the various sections of code and what they are performing

## Implement snooker in PGE

- now create a new simple PGE program which just creates the boarders (you will need a main which can be borrowed from the breakout example)
- now take a copy and introduce a single moving circle (cue ball) which is dropped from the point 0.5, 0.5
  - gravity must be turned on!

## Implement snooker in PGE

- now turn gravity off and give this circle an impulse upwards (see the breakout code for a working example of an impulse)
  - check the PGE documentation for more details
- add some snooker "red's"
  - observe what happens when the cue ball hits the red balls

## Implement snooker in PGE

- now add a background green to the PGE world
- now add some pockets
- implement some callbacks for the pockets
  - to delete a "red"
  - reposition the cue ball
  - and calculate the "break" value
- continue to work on this program as part of some directed learning throughout the week

## Conclusion

- we have
  - understood more about the PGE API
  - created a small snooker game using PGE
  - understood how PGE integrates with PyGame
  
- you might want to read around the subject by reading this paper [The Construction of a Predictive Collision 2D Game Engine](#) (`../../..../Papers/paper21/ieee.pdf`)