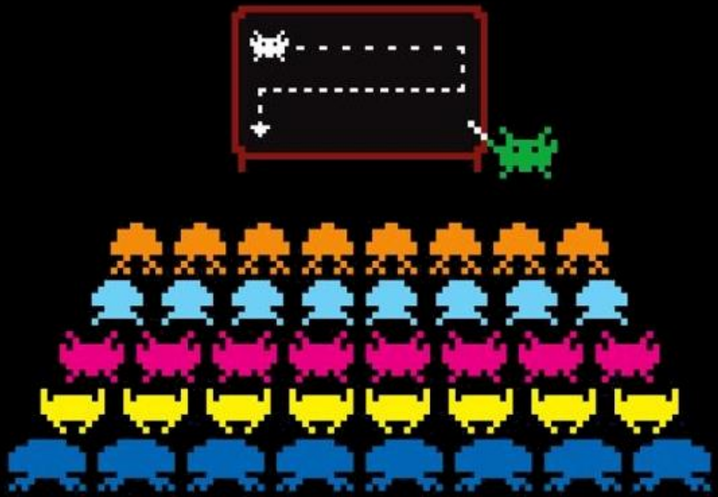

SCRIPTING LANGUAGES

Desenvolvimento de Jogos de Computador

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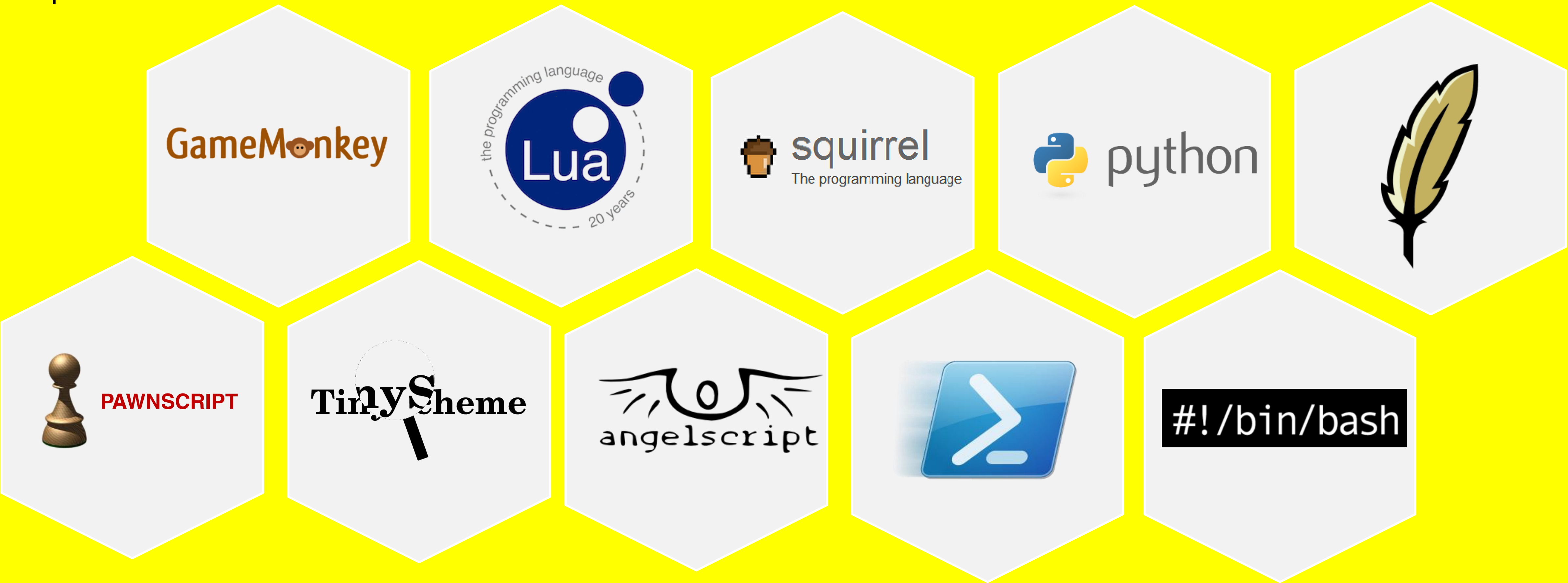
DEFINITION

*“**Scripting language**: (skript´ing lang´gwij) **(n.)** A high-level programming language that is interpreted by another program at runtime rather than compiled by the computer's processor as other programming languages (such as C and C++) are.”*

in webopedia

“Pretty much, simplified programming.” *in League of Legend Forum*

SCRIPTING LANGUAGES



GAMES & SCRIPTS

- Many games use scripting languages for animation and game play logic.
- Sometimes you can extend the game actions, scenarios and missions using scripts.
- This is a great way to give power to the game owner (*player*).

SID MEIER'S CIVILIZATION V

LEAGUE OF LEGENDS

PORTAL 2

COUNTER STRIKE GLOBAL OFFENSIVE

SCRIPTING LANGUAGE PROPRIETIES

- Almost all scripting languages are cross-platform besides the ones that are specific to the operative system (Bash, PowerShell, AppleScript)
- The level of access to game engine can vary:
  - When its used to create a game the scripting language can interact directly with the game engine.
  - When its used by the players the access is high-level, and may depend on the game and the implementation of it.
- Integrate very well into many languages, particularly C/C++.

CASE STUDY GARRY'S MOD

- Garry's mod is an open world game.
- You can create everything like buildings, weapons and characters, gamemodes and other neat features.
- Lua is the scripting language used to create and animate anything you want to add to the game.

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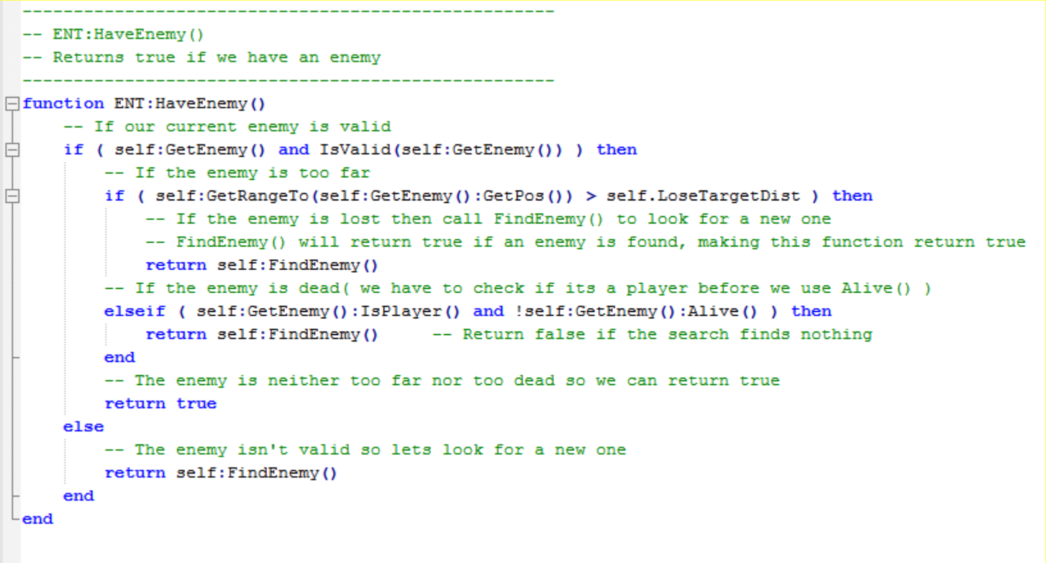
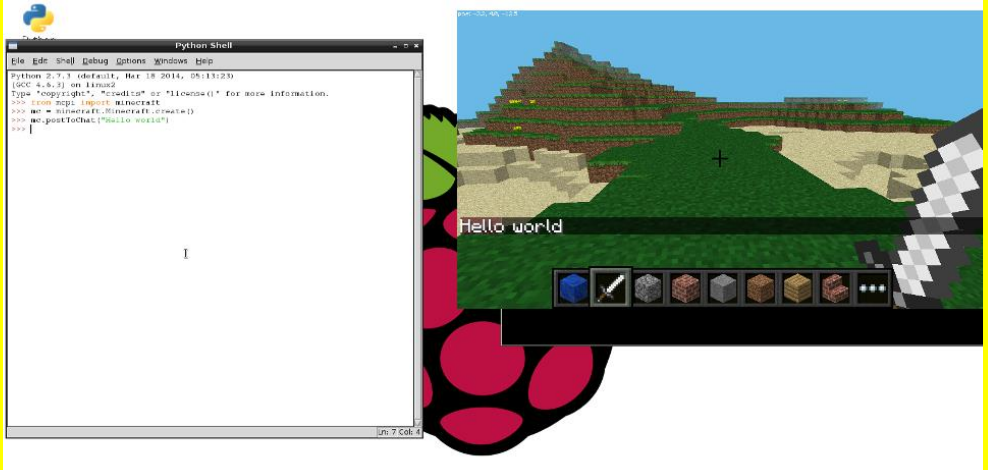
CASE STUDY GARRY'S MOD



```lua
-----------------------------------------------------
-- ENT:HaveEnemy()
-- Returns true if we have an enemy
-----------------------------------------------------
function ENT:HaveEnemy()
    -- If our current enemy is valid
    if ( self:GetEnemy() and IsValid(self:GetEnemy()) ) then
        -- If the enemy is too far
        if ( self:GetRangeTo(self:GetEnemy():GetPos()) > self.LoseTargetDist ) then
            -- If the enemy is lost then call FindEnemy() to look for a new one
            -- FindEnemy() will return true if an enemy is found, making this function return true
            return self:FindEnemy()
        -- If the enemy is dead( we have to check if its a player before we use Alive() )
        elseif ( self:GetEnemy():IsPlayer() and !self:GetEnemy():Alive() ) then
            return self:FindEnemy()     -- Return false if the search finds nothing
        end
        -- The enemy is neither too far nor too dead so we can return true
        return true
    else
        -- The enemy isn't valid so lets look for a new one
        return self:FindEnemy()
    end
end
```

CASE STUDY MINECRAFT PI



```
Python 2.7.3 (default, Mar 18 2014, 05:13:23)
[GCC 4.6.3] on linux2
Type "copyright", "credits" or "license()" for more information.
>>> from mcpi import minecraft
>>> mc = minecraft.Minecraft.create()
>>> mc.postToChat("Hello world")
>>> 
```

- Minecraft free version built for Raspberry PI.
- Uses Python scripting language for manipulating the world.
- Principally used as a programming teaching tool for kids!

SCRIPTING ADVANTAGES

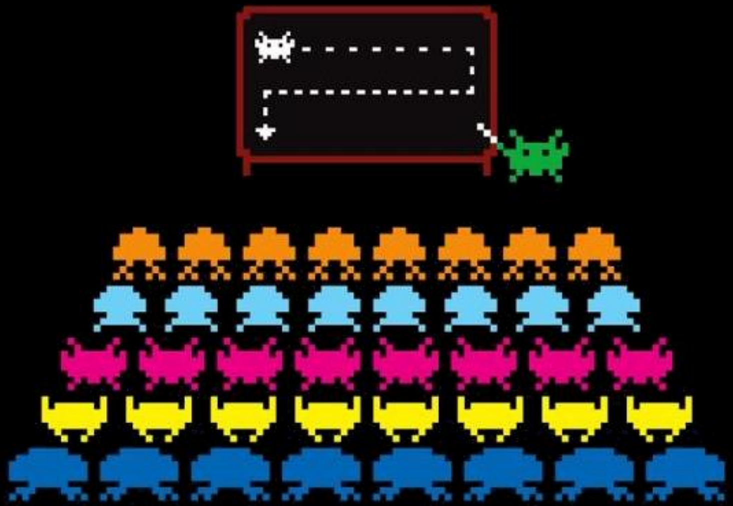
- Flexibility of type defining.
- Rapid turnaround of interpretation.
- Higher level semantics.
- Development speed.
- Ease of learning.

SCRIPTING DISADVANTAGES

- Syntactic and other limitations.
- Tend to limit their efficiency and expressive power.
- Have very limited support for concurrency, data structuring, information hiding, object-oriented programming, regular expressions, etc.
- Disturbingly easy to write bugs into the script-side of your game code that are very difficult to detect because due to the use of specific language features they will only trigger in very specific unforeseen circumstances, at **runtime**.

USEFUL LINKS

- Lua Language: http://www.lua.org/
- Squirrel Language: http://squirrel-lang.org/
- Raspberry Pi + Python: http://www.raspberrypi.org/resources/learn/
- Garry’s mod: http://wiki.garrysmod.com/page/Category:Lua_Tutorials



THANK YOU! | Questions?