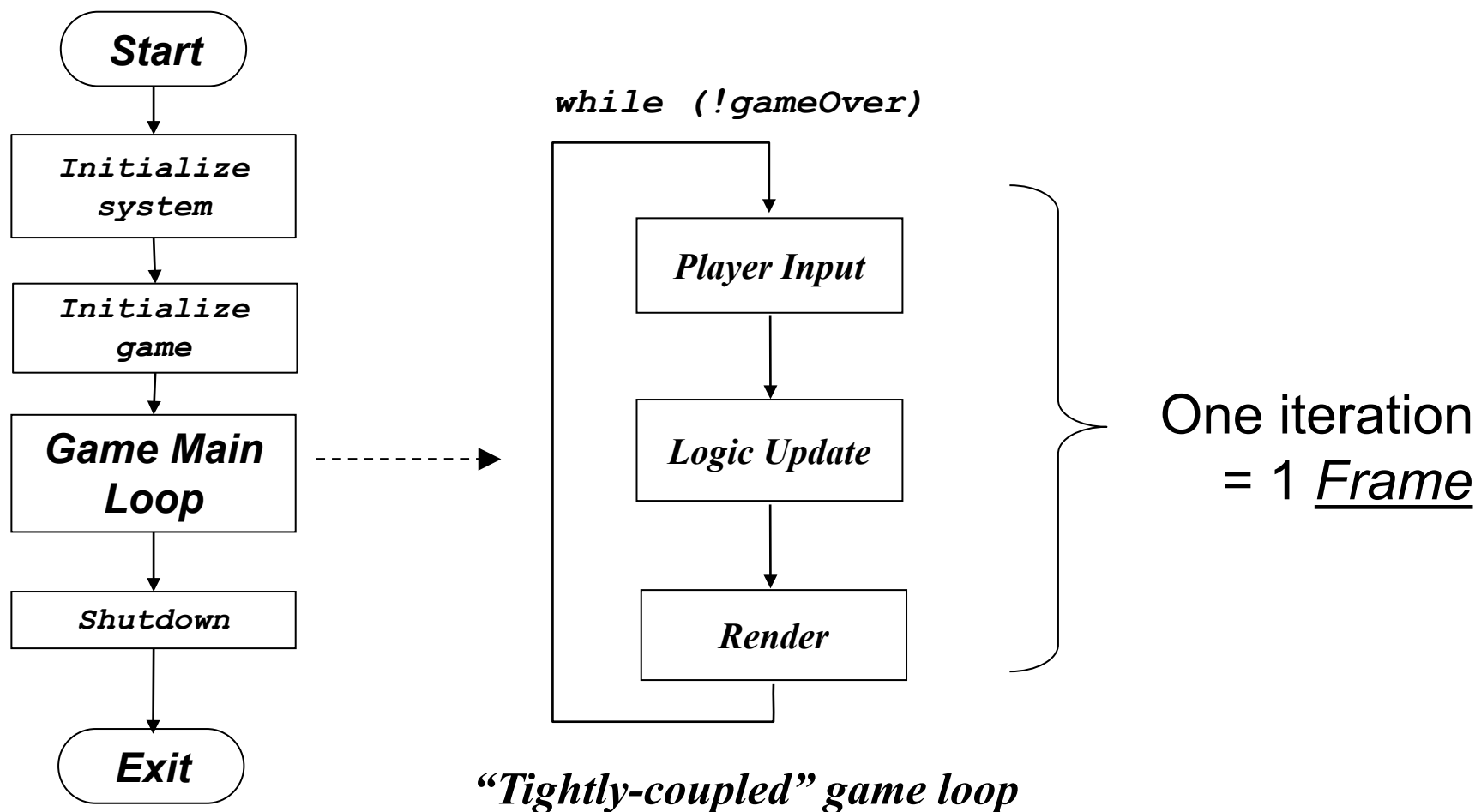


01 - Game Engines

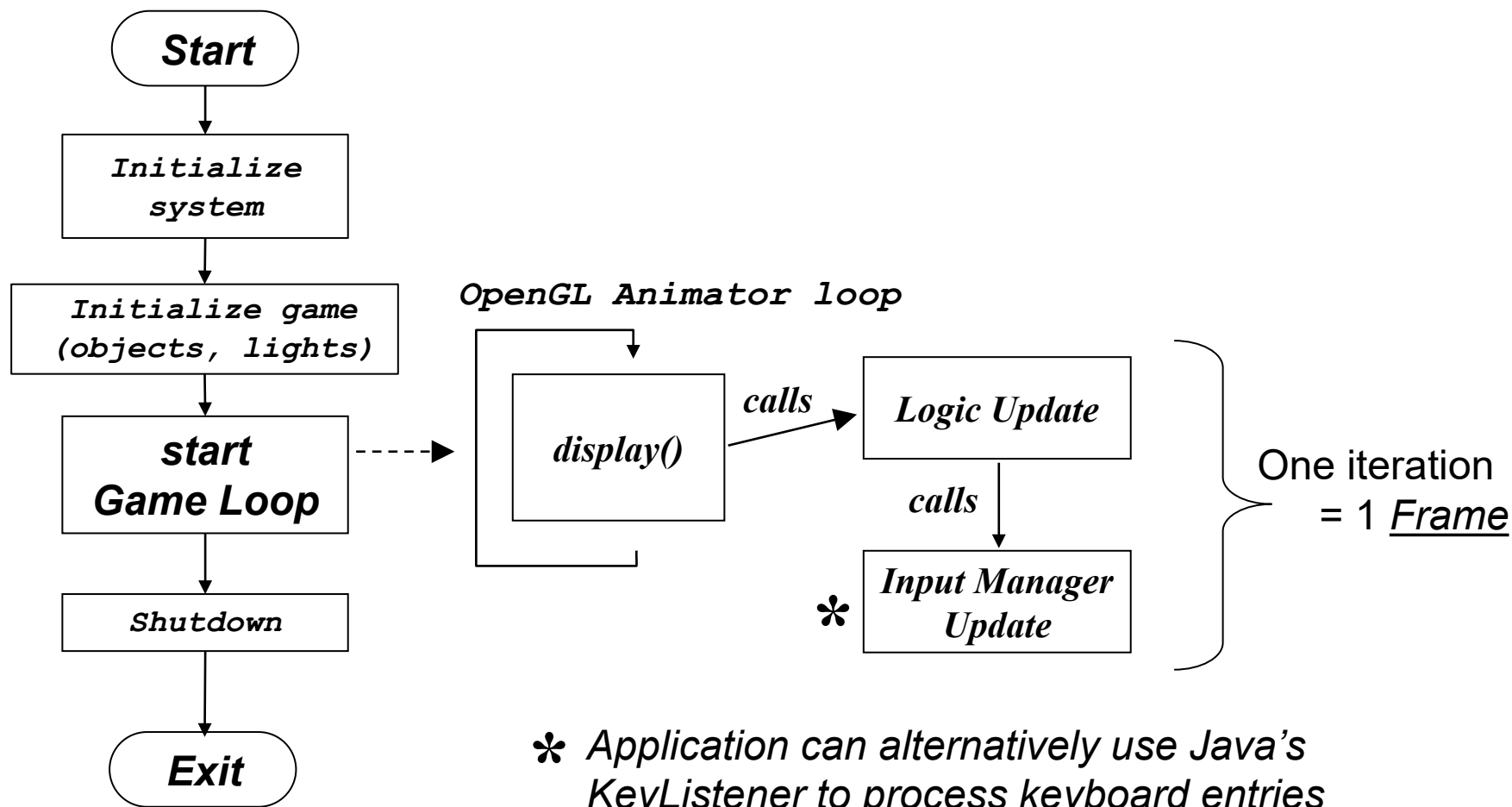
Basic Game Structure



Basic Game Structure

- The **frame rate** is how often the screen is re-drawn
 - faster frame rate = smoother rendering and play
 - faster frame rate requires more processing power
 - frame rate can be “fixed” or “variable”
- The **game loop** manages the real-time game processes
 - *input* – user pressing a key or moving a joystick
 - *update* – game world is updated (objects moved, score updated, etc.)
 - *render* – game world (graphics) is rendered on the screen
 - They each have their own timing issues, depending on the game
- A simple type of game loop is called “*tightly-coupled*”
 - input, update, and render are all processed each frame
 - every process is “coupled” to the frame rate
 - the TAGE game loop is tightly-coupled (mostly)
- There are many other game loop organizations
 - we will learn some others later in the semester

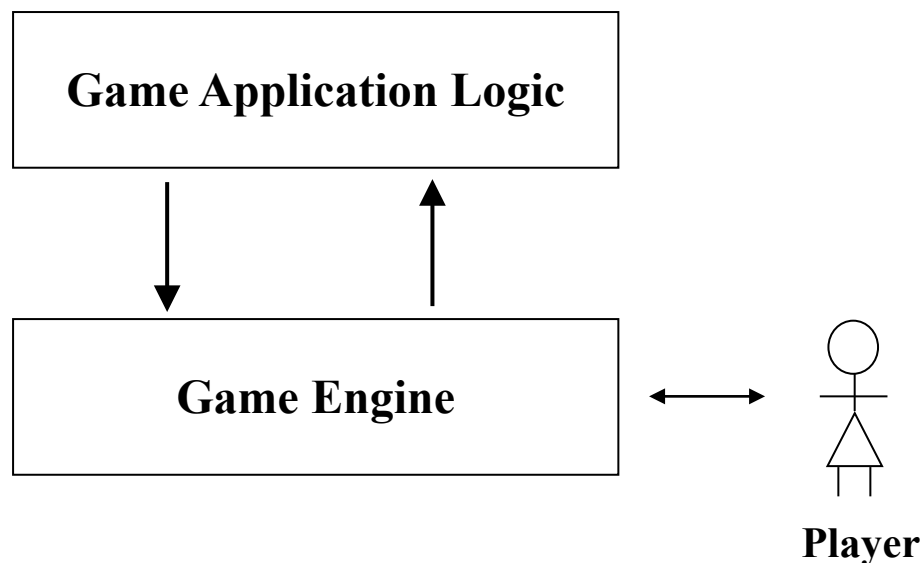
TAGE Variable Frame Rate (tightly-coupled) Game Loop



Game *ENGINE*

A reusable collection of modules

- Independent of any particular Game Logic
- Encapsulates platform dependencies
- Possible because all games have things in common



Typical Game Engine Functions

- Simulation of elapsed time
- Scene Management
 - Objects, geometry details
- Rendering
- Collision Detection/Handling
 - Physics simulation
- Lights, Shadows, Textures
- View (camera) control
- Input handling
- Sound generation
- Network communication
- Special effects
 - Explosions, fire, ...

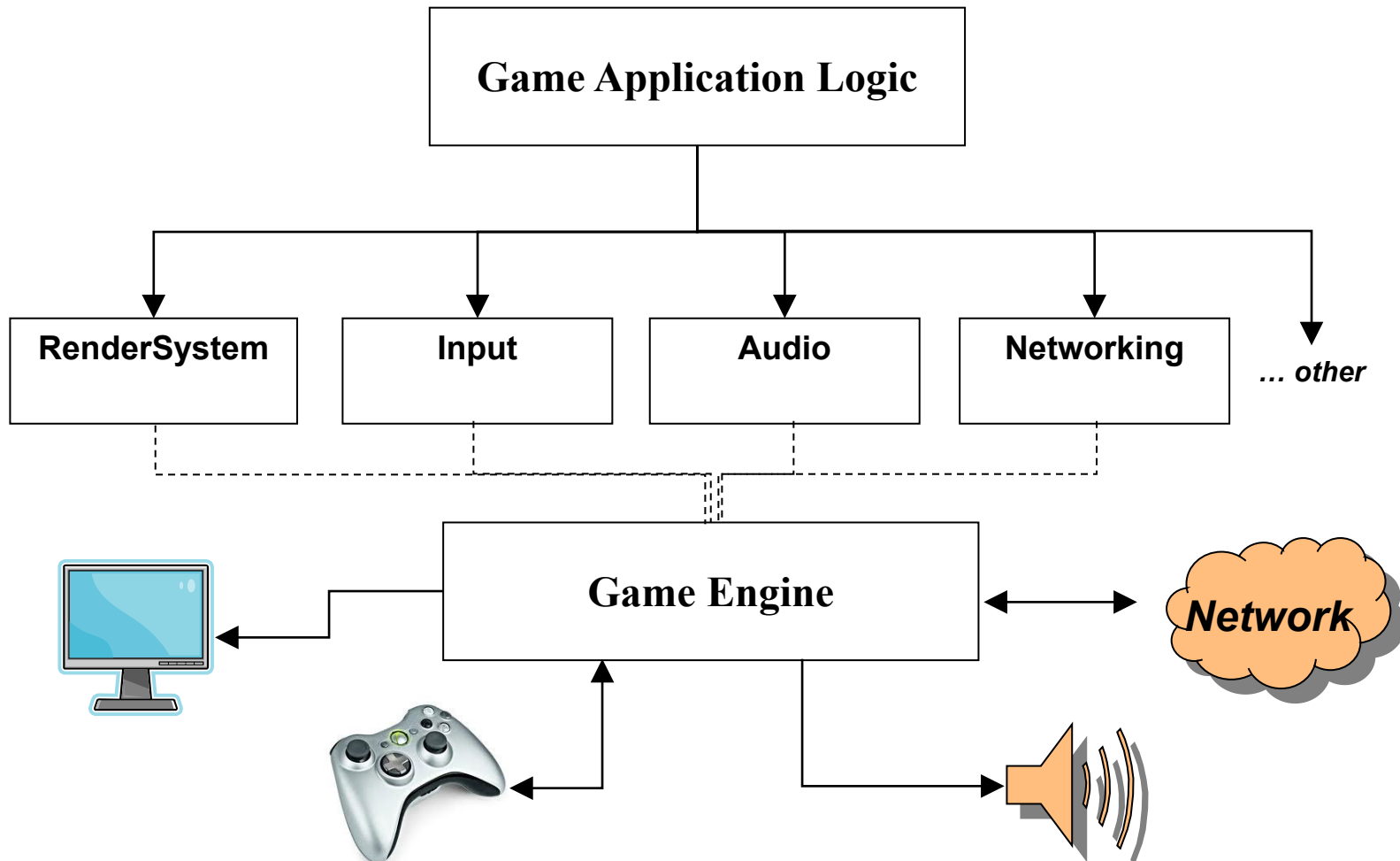
Some Game Engines

- o Unity
- o Unreal
- o Godot
- o CryEngine
- o Blender
- o Panda 3D
- o GameMaker
- o jMonkey
- o OGRE
- o Quake
- o Lumberyard (Amazon)
- o Torque 3D
- o Hero Engine

For an expanded list see:

http://en.wikipedia.org/wiki/List_of_game_engines

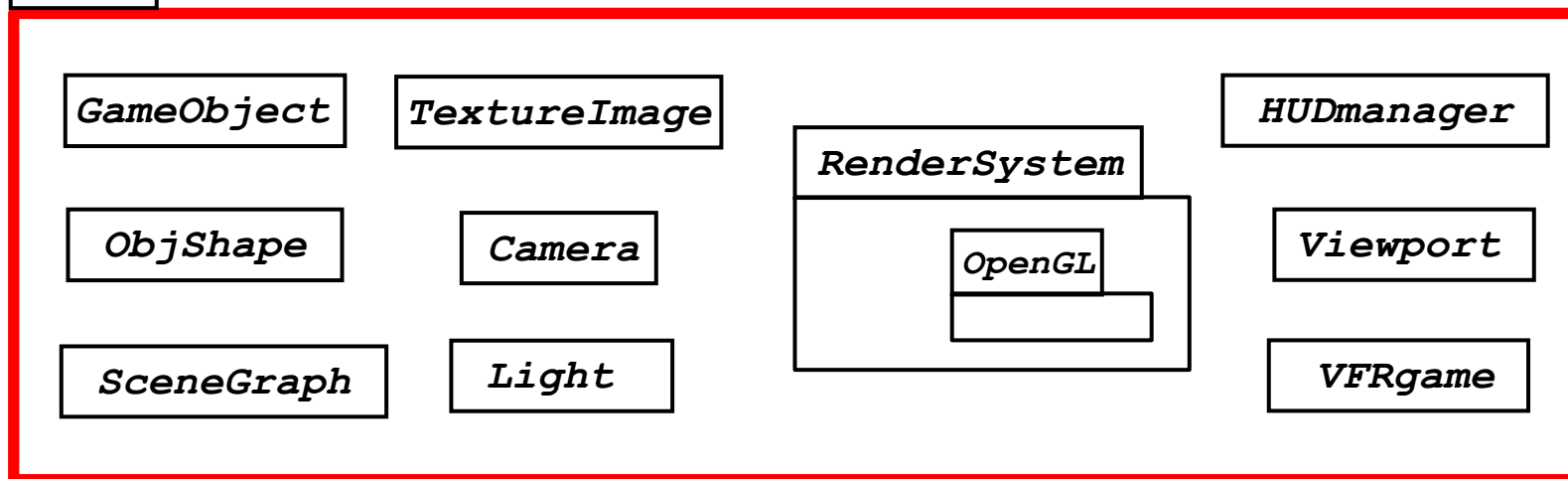
Game Engine Design



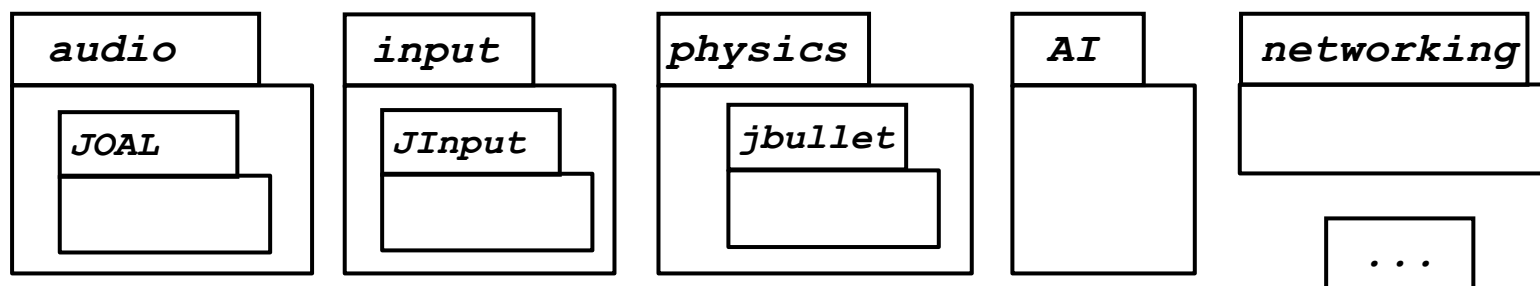
TAGE : “Tiny -- Game Engine” ***or: “Another Tiny Game Engine”***

A collection of Java *packages*

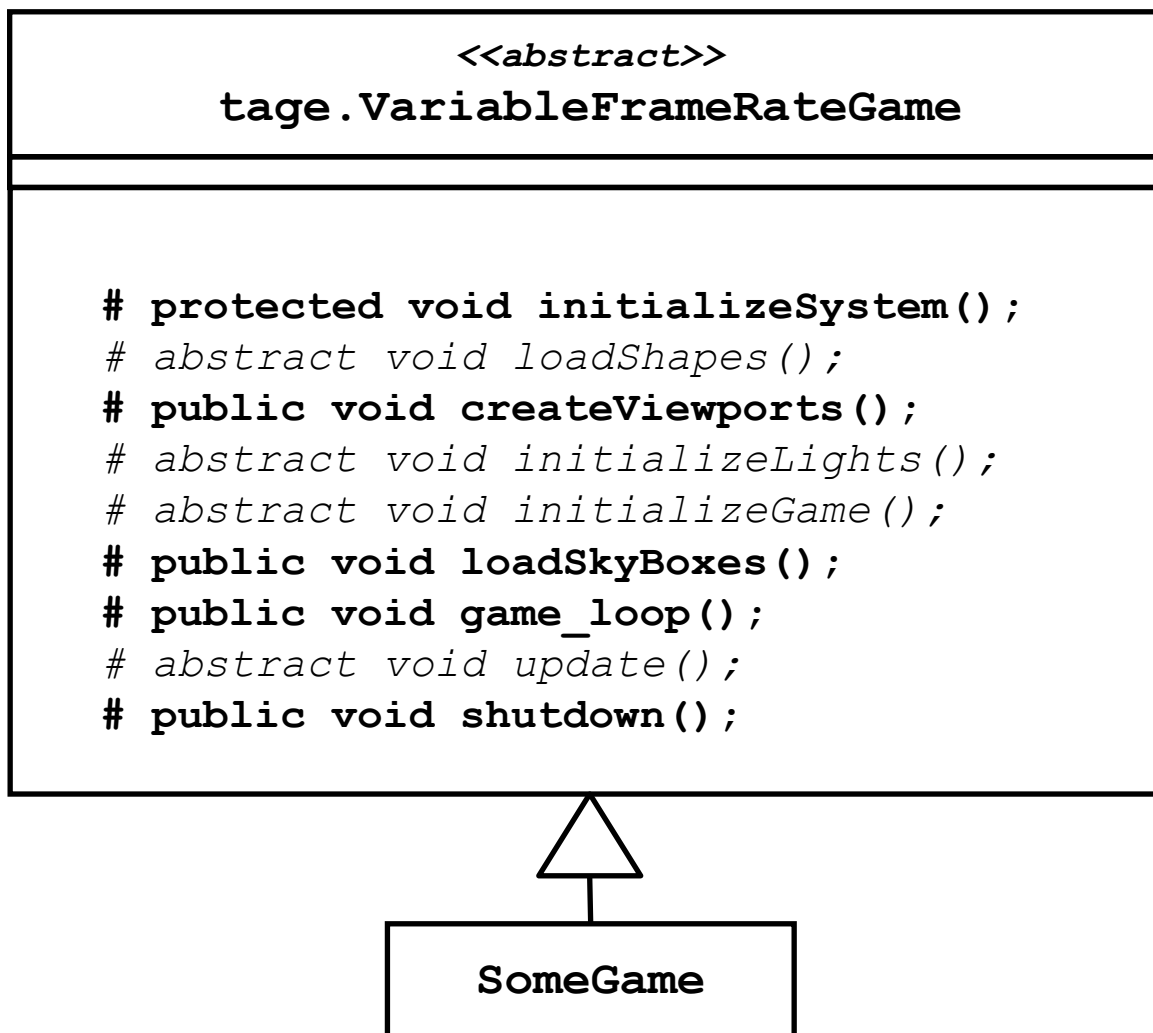
tage



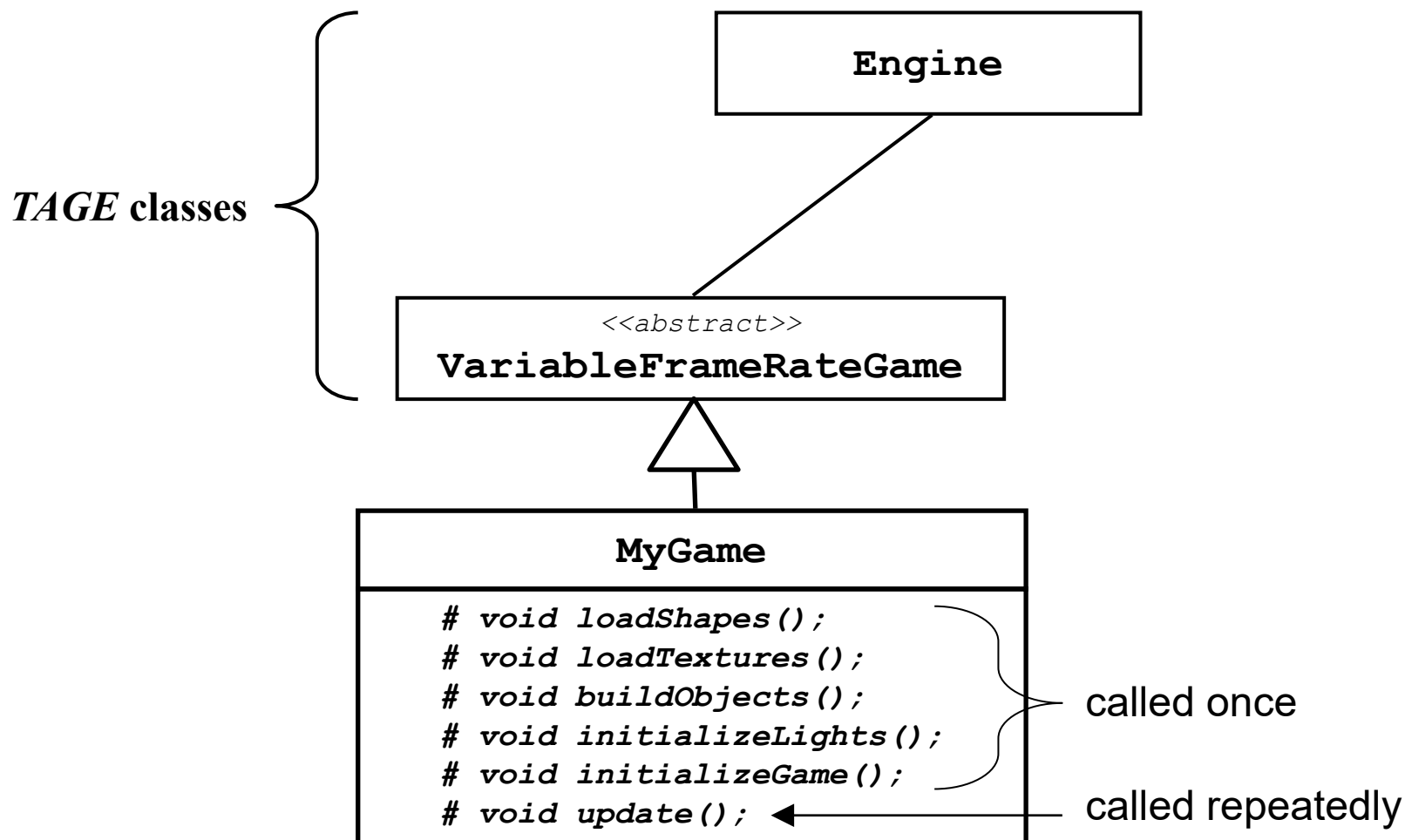
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Abstracting Game Structure



Creating A Simple Game



Note –

there is another game engine called “TAGE”.

looks like a personal project...

by MagnusRunesson

(he worked on Angry Birds)

*“**Tiny Arcade Game Engine**”*