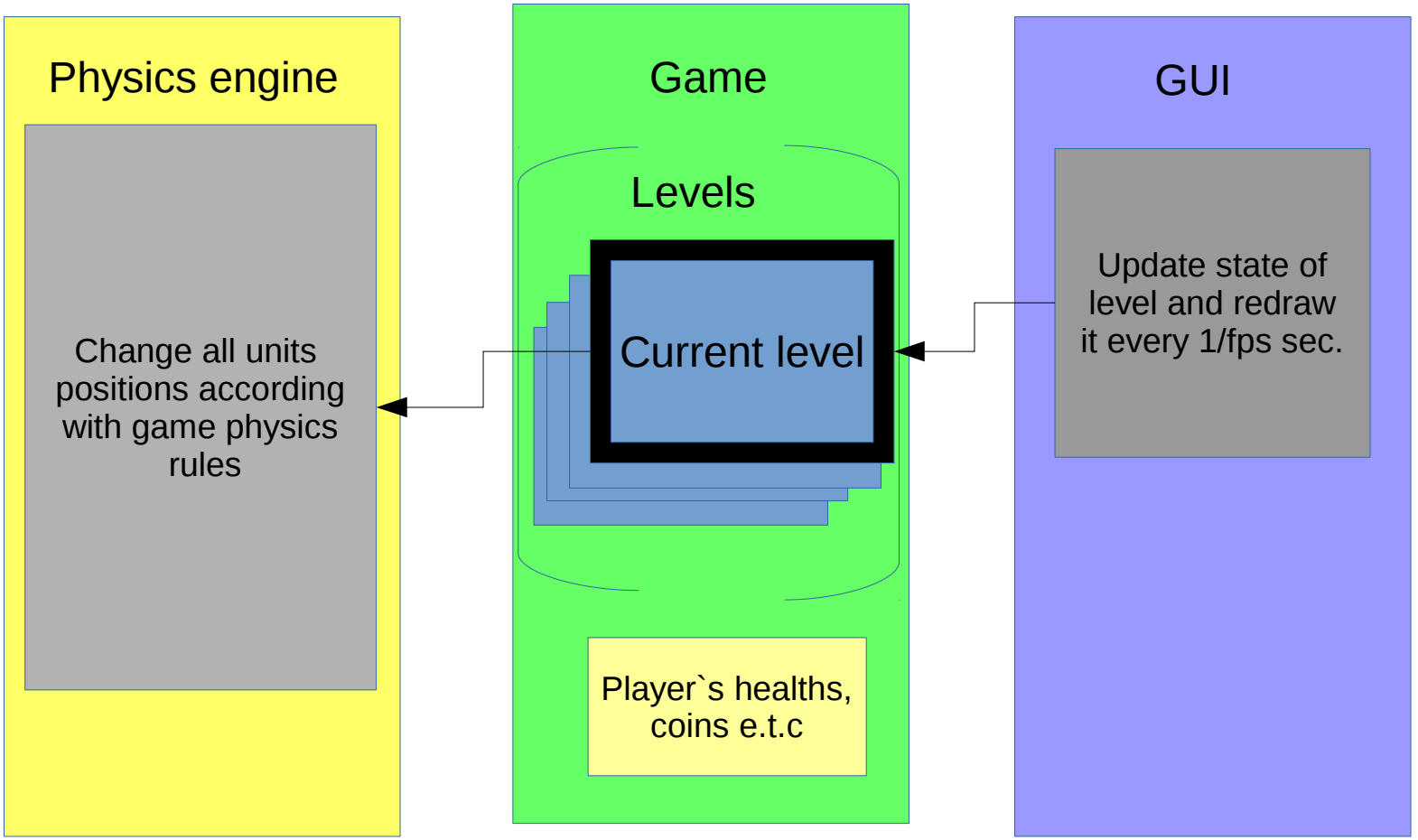
Our game project

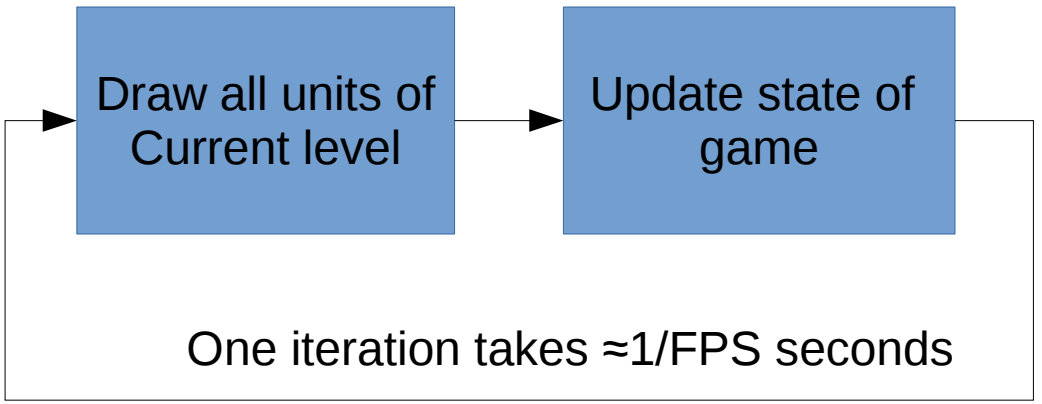
- Modules of the project
- Interaction with player
- Physics engine structure
- Unit structure
- Collision matching
- Collision events
- GUI

Modules of the project

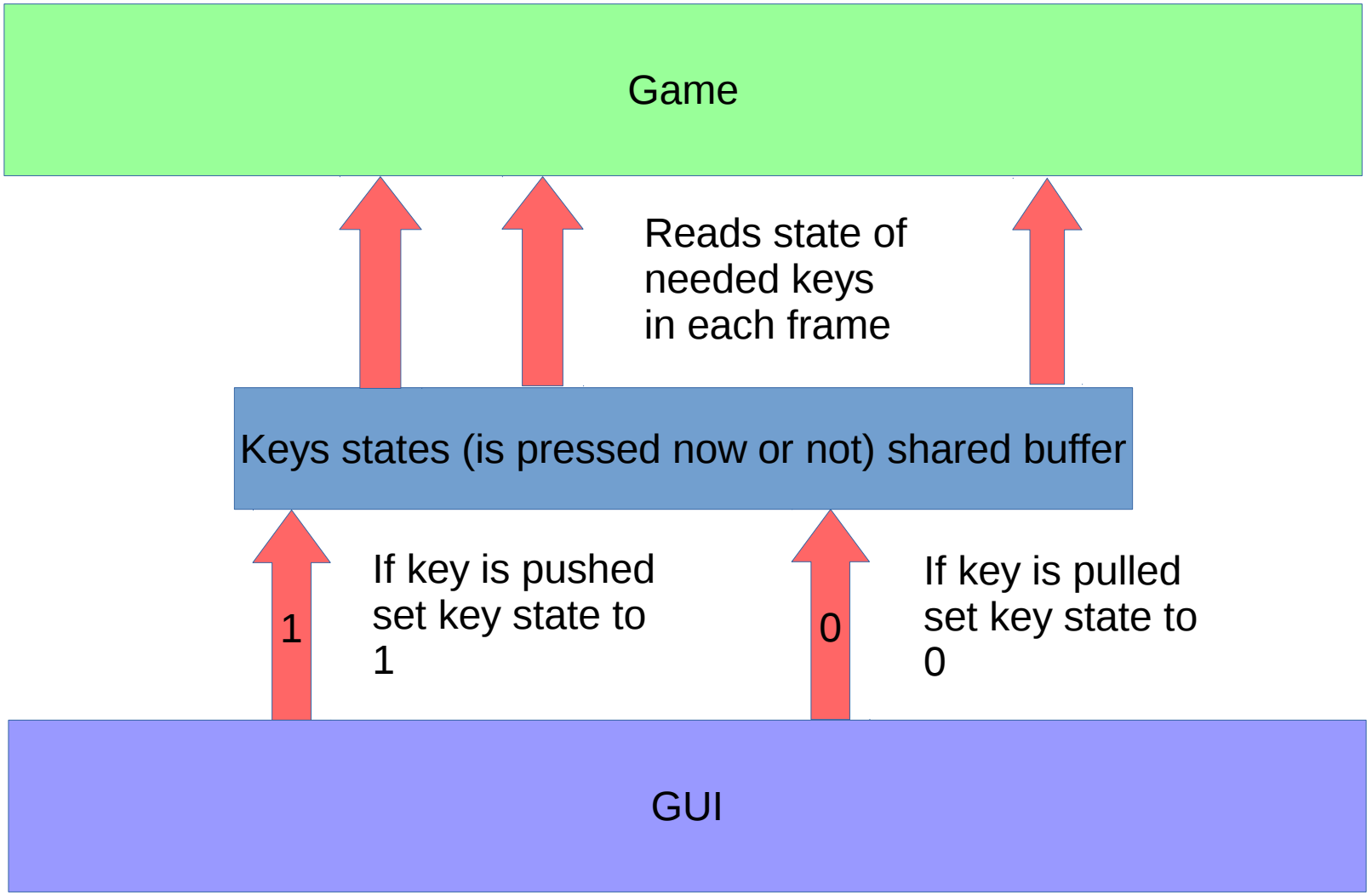


Modules of the project - GUI

- GUI layer of the project does not know about any details of game. It has only API of game which can give for GUI coordinates of rectangles of all units to drawing and textures associated with every drown rectangle.
- Also GameAPI has function to update states of units by one frame.
- GUI draws all rectangles in the level, fill it by associated textures and call function to update state of the game. After it GUI repeats this sequence of actions by every 1/FPS seconds.



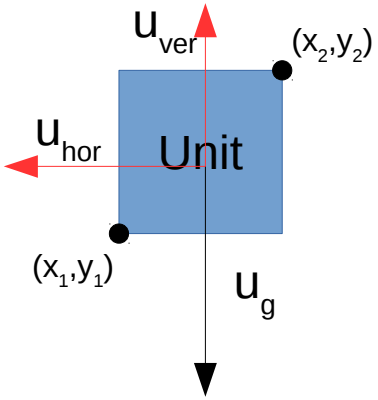
Interaction with player



Physics engine structure

- World represents engine functionality.

Unit structure

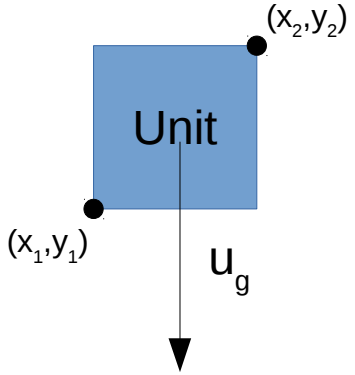


$$[\vec{u}] = \frac{points}{frame}$$

Size and position of unit can be described by two points: left bottom (x_1,y_1) ant top right (x_2,y_2).

For describe current state of the unit in the world it's enough to have a two current speed vectors: vertical and horizontal. Measure of speed in our game context is points per frame. Each frame = n seconds. Also it is speed given by gravitation, and it always force unit.

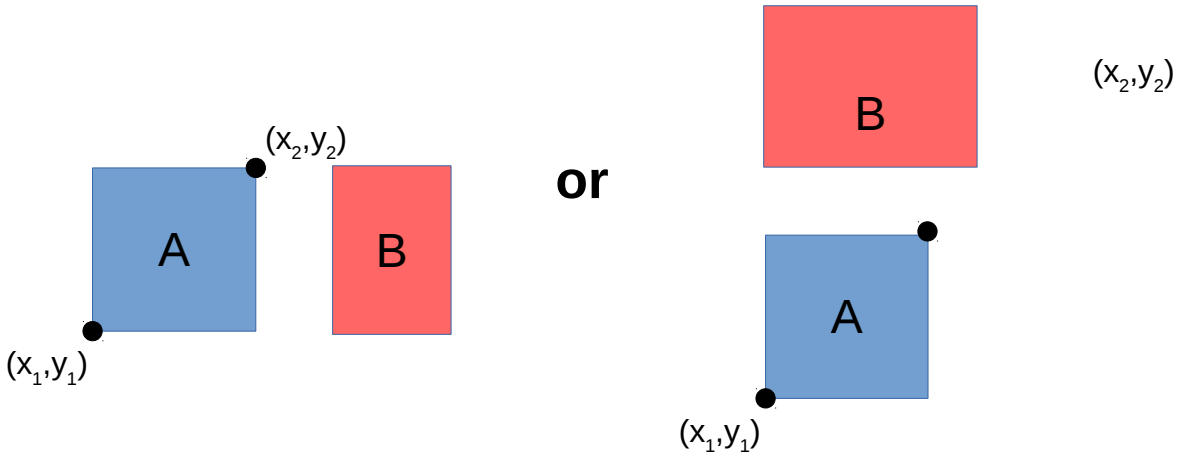
If unit is alone with no other units, it has only vertical gravitation speed, witch make unit move down.



If two blocks bumped, block with lower priority takes speed of block with higher priority. So each unit should have priority. Units of ground and walls normally have the largest priority.

Collision matching

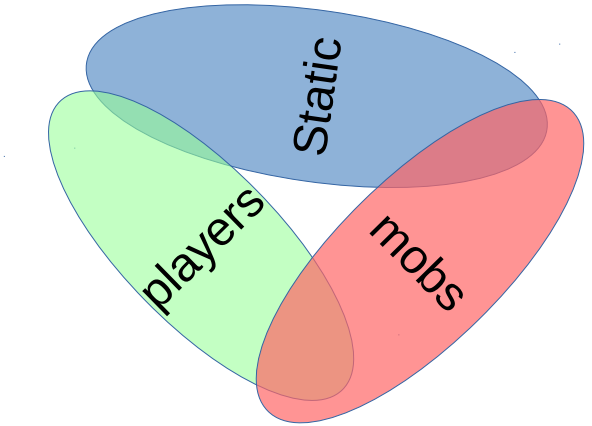
Position of A < position of B:



Unit A position is less then unit B position if end of A by x is less then begin of B by x or top side of A is less then bottom side of B. In the other cases collision has place.
In the engine it means that if **NOT(A < B) AND NOT(B < A)** then they are collised.

Collision matching

- There are three sets of objects: static, mobs and players.
- Collisions are matching only between different sets.



Collision events

- Each collision cause changing of speeds and positions of units