2680000000
● C/C++ engine
● Lua for game logic
● 3D with 2D focus
● Component based
  ○ Physics, 2D sprites, Spine models, tilemaps, 3D models, physics, sound, scripts, etc
● Modular
  ○ Remove what you don't need
  ○ Extend with additional native code
● Small
  ○ Google Play Instant
  ○ Facebook Instant Games
  ○Playable ads
Dominate The Enemy!
Debugging
Debugging in a cross platform game engine

- Engine core in C/C++
- Platform specific code on top
  - JS for HTML5
  - Objective-C for iOS and macOS
  - Java for Android
  - More C/C++
- Ratio is somewhere around 20:1
- Good debugging tools is a must
- Usually enough to debug on host platform
Debugging HTML5 in a cross platform game engine

- HTML5 builds using Emscripten
  - With support for WebAssembly
- Emscripten can generate source maps
- Browser dev tools support source maps
- Debugging can be done in the browser
- Even better if you can debug using a debugger of your choice
  - Remote debugging + IDE plugin
- But what about WebAssembly?
Debugging graphics

- Inspect textures, shaders, draw calls and frame composition
- OpenGL ES 2.0 and WebGL
- Desktop and mobile has RenderDoc, XCode, GAPID
  - Very powerful tools
- Debugging WebGL
  - Spector.js
  - Can the browser dev tools provide this?