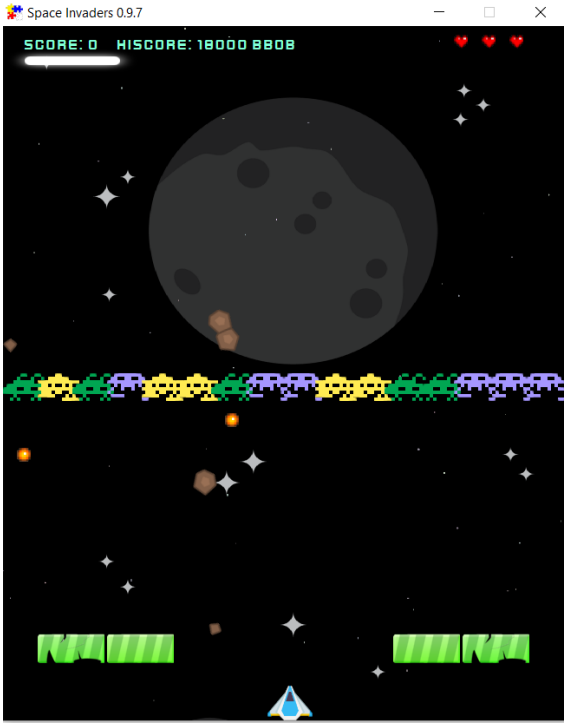
CW2 Software Maintenance spec sheet: SpaceInvaders

Please also refer to the CW2 release sheet for coursework details.

A. Add a new level. [20%]

The boss thinks the game is too hard. Add an additional level at the start of the game with the following properties:

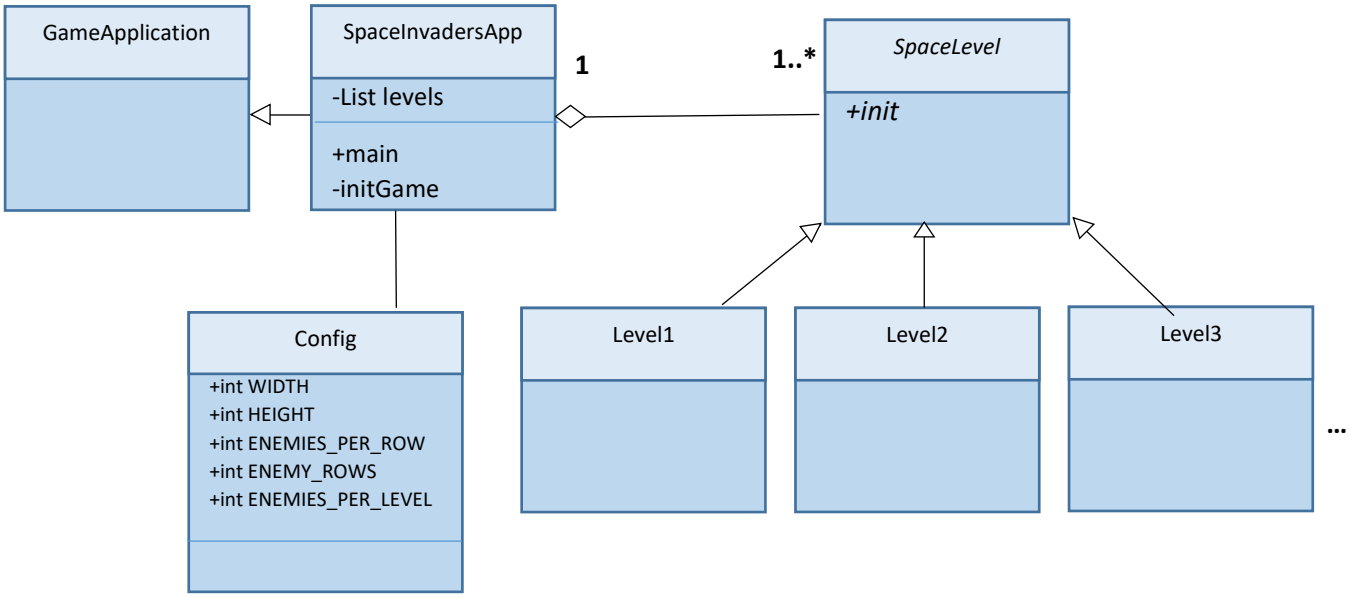
1. All the enemies should be in one horizontal line half way up the screen
2. They should *not* move.
3. This should be added as the first level; all the other levels should shuffle down one level number (e.g. the original level 1 becomes level 2, etc.)
4. The enemies should appear as in the screenshot below



HINTS

You find some notes from a previous developer:

- "When building levels, note spaceinvaders.level package will be useful"
- "It's a good idea to use an existing level as a starting point. Different levels have different arrangements of bad guys and different movement characteristics. Level 2 is fairly simple"
- They also left this quick sketch of a class diagram, which may help:



B. Add a new weapon. [20%]

The boss is liking how the game is coming along, but wants more variety in the weapons. "How about adding a new weapon which kills a random number of enemies – if you get lucky it may destroy them all!"

Your tasks:

1. Add a new bonus weapon power-up.
2. You will need to create a sprite (graphics file) for the weapon graphic
3. Add functionality so that when picked up, it will destroy a random number of enemies from those currently onscreen.
4. Additionally the boss would like more bonuses to spawn. Increase the chance of a bonus spawning from 25% (on killing an enemy) to 50%.

Unfortunately, there is no documentation on this section of the code.

Your only knowledge is that graphics files are normally stored in a "…resources\assets" folder.

You will need to figure out how the code around bonus weapons works.

C. Add a sprite editor [40%]

For this part, the core game coding team have asked for a tool to support the graphics development of the game. Your task is to write a simple sprite editor to edit the graphics assets in the game.

Note: *you should use knowledge gained in the JavaFX lectures to help solve this part of the coursework. Therefore, it may be best not to start coding until after those lectures.*

Your tasks:

For moderate marks:

- Make a GUI which allows the user to pick and set colours in a 16x16 grid, using JavaFX
- This represents the pixels in the sprite
- The user must be able to pick from a pallet of at least 8 colours

Elements of this will be demonstrated in the lectures/labs.

For higher marks:

- You should be able to load in an existing PNG file and represent this on your grid of pixels
    - The user should be able to edit this loaded sprite
- Allow the user to pick from a full palette of colours (rather than a limited palette of 8)
- Save the sprite to a .png file.
- Allow the user to set and work with different size sprites/canvases (e.g. 16x16, 32x32, 64x64)
- Well thought out and presented design features
- Good coding practice

You will need to make the app into a runnable .jar file, and place it into a \bin folder from the project root.

You will also need to record a short <2 minute video demonstrating your tool (see coursework issue sheet for details).

Note that use of git via our School GitLab servers will be assessed for the final 20% of the coursework marks.