Lecturer: Dr. Oisín Cawley

Continuous Assessment 1
Value: 15% of overall mark
Due Date: Wednesday 18th Jan 2017

Defender

You must produce the game "Defender". This is a single player side-scrolling shoot 'em up. The aim of the game is to protect the astronauts on the surface of an alien planet from being abducted by alien ships. If all astronauts get abducted the game is over. If all aliens are destroyed the level is complete and the next level begins. Higher levels are simply increased alien numbers and speeds.

The player's ship is controlled using the left, right, up and down arrows. Left and right arrows cause the ship to instantly change direction. Continuously pressing the left or right key will cause the player's ship to accelerate in that direction (up to a reasonable maximum). The up and down arrows will move the ship up or down within the confines of the screen. The space bar fires a laser. A key of your choice activates a smart bomb which destroys everything on the screen but it takes 1 minute for a smart bomb to be replenished. Another key of your choice activates a hyperjump which transports the player's ship to a random location in the game world. Note: this may be catastrophic for the ship and should only be used in emergency. You can only use one hyperjump per game unless the player picks up another by means of a power-up.

Enemy entities come in different guises and display differing behaviours as below.

Astronauts

These are humans on the surface of the planet. They wander slowly along the bottom of the screen examining the planet's surface. If an alien ship is near they will try to evade it. However, since they are small and can only move very slowly (and in one dimension) they are never able to outrun an alien ship.

Alien Nests

Nests are alien space ships which wander around the game world producing abductors (see below). They will produce a maximum number as set by the game developer. 20 might be an appropriate number. When the player's ship is within range they will take evasive action, otherwise they wander at random. A nest will fire interceptor guided missiles at the player once the player is within range. Interceptor missiles have the same maximum speed as the player and will explode if they do not reach the player within 10 seconds. A nest can only have two interceptor missiles "live" at a time.

Abductors

These are alien ships which target the astronauts on the surface. When two or more abductors are in the vicinity they flock together. They patrol the surface until they are close to an astronaut. Then one abductor will go and try to pick up the astronaut (it leaves the flock if it is in one) and slowly ascends with the astronaut. If they reach the top of the screen without being shot, they transform into a mutant (see below) and the astronaut is lost. Abductors can fire single bullets at the player if they are in the vicinity.

Note: The player should somehow be warned when an abduction is in progress so they have a chance to save the astronaut (they should be able to tell from the radar where it is happening). If the player kills the abductor before he reaches the top of the screen, the astronaut drops back safely to the planet's surface.

Mutants

Mutants are highly aggressive alien ships which will seek out and attack the player's ship. They require twice as many hits as an abductor to be killed. When more than one mutant are in the vicinity they swarm together. They seek out the player and will attack intelligently when within range.

Obstacles

Exactly what it says on the tin e.g. meteors.

Power-ups

To be decided by individual game designers.

Game World

- The bottom portion of the screen is the surface of an alien planet. The player is controlling a ship flying just above the planet's surface. The astronauts are visible on the surface.
- The screen should scroll left to right so that the player's ship is always in the centre of the screen. The game is wrap around with the total area of play 9 times that of a single screen. Game starts in the middle.
- Radar will be provided for the player showing a map of the entire world at the top of the screen.
- Friction operates in the game and any moving object will slow down over time if thrust is not applied to it.
- All entities try to avoid obstacles. Collision with an obstacle results in death.
- A scoring mechanism should be used and the current score displayed on screen.

Project Details

Game to be produced in C++ with SFML and documented using Doxygen. You might check out the following link for some art/sprites: http://opengameart.org/

Marks for each component specified above, a range of intelligent behaviours, smooth movement, playability and efficiency of algorithms. Bonus marks for extras (once cleared with me first).

Player	Astronauts	Nests	Abductors	Mutants	Obstacles	Power-ups	Radar	Doxygen	Code Quality	Enjoyability	Total
10	10	10	10	10	10	10	10	5	5	10	100

This will be a team project. Teams to be assigned in class.

Deliverable

A zipped up folder containing all the source code.
You should include instructions for any setup that is required to get this to run.