# Breakout Game

Breakout is a game where a ball bounces around a play area which is enclosed on three sides. The 4th side is defended by a paddle that the user moves to bounce the ball back into the play area. The play area consists of blocks that make up a level pattern. The aim of the game is to bounce the ball around the play area such that it collides with the blocks and explodes them. The level is complete once all the blocks have been exploded. You have 3 lives to complete the level, where a life is lost if you fail to get the paddle under the ball along the 4th side to bounce it back into the play area.

If you have never come across this game before, I would recommend that you do an online search for “Breakout Game” to better familiarise yourself with it – there are loads of playable demos available (including a Google search easter egg).

You are free to interpret and implement any specific rules and game features you wish, although below are some suggestions:

**Power-ups**: at random, power-ups drop down from exploded blocks. If the user’s paddle catches them before falling off the window, they get that power up:

* Shooter: pressing the space will fire a bullet into the play area that will explode blocks – only one bullet at a time
* Larger Paddle: doubles the standard paddle size
* Instant Death: the player loses a life.
* Double speed: ball travels at double the usual speed. This should have a limited lifespan before returning to normal speed.
* Juggernaut ball: while active, the ball continues its path through blocks (i.e. it doesn’t bounce) and only bounces against the window sides and paddle. This should have a limited lifespan before returning to a normal ball

**High score table**: the game preserves a high score table that is loaded at the start of the application and saved once the application closes

**Multiple levels:** you might need to think about how different levels can be used and while it is not expected that you have a large number, more than one might be useful.

**Other Considerations**

* How might the ball-paddle reflection change based on edge or flat of the paddle along with its speed
* Maybe use a constant speed to control the paddle with the keyboard so it doesn’t just track the mouse position for a harder game (i.e. unless you predict the path of the ball, you are less likely to get the paddle in place in time)
* Maybe some blocks are more durable than others and need multiple hits before they explode

*It is not the intention of this document to tell you how to implement the game or where and when to apply the different features and competencies being assessed – that is still up to you to think through and apply in a meaningful way. You are also free to select whatever features you wish to tailor and personalise your breakout game. The purpose of this case study is to provide a concrete application that you can focus on and start applying those principles and processes. We have and will continue to discuss designs and how to code things up in semester 2. Apply those processes to your thought processes as you develop this application.*