

## Ball and ball (with Jack language)

*produced by 徐近庭(csie 1) 彭昱齊(csie 1)*

Ball and ball is a funny game written with Jack language, in which we have our main character, and our purpose is to dodge the balls and survive as long as we can.

Here, let's make a closer look at each part of our program.

### First section : choosing difficulty

ball and ball



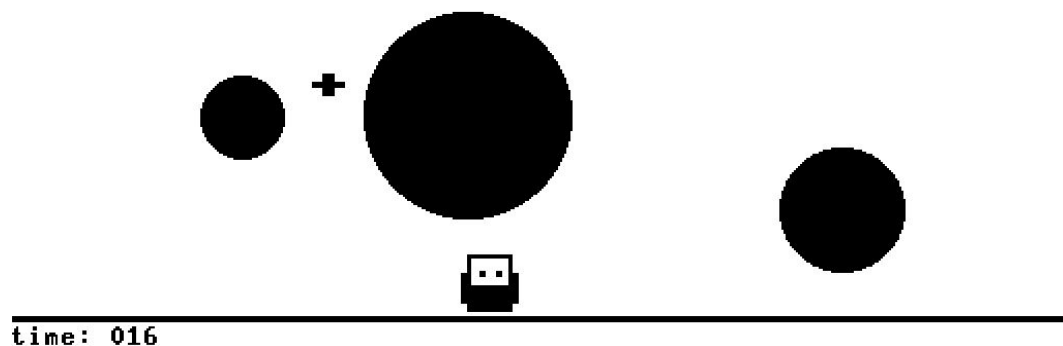
Level1

Level2

Level3

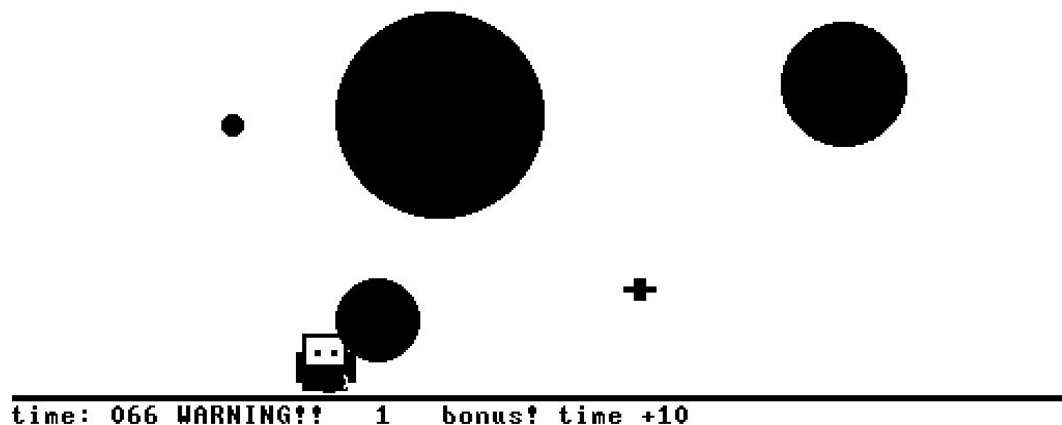
As you can see in the picture above, there are three optional difficulties that you can choose. Moving the bouncing ball to make a decision.

### Game execution: easy mode



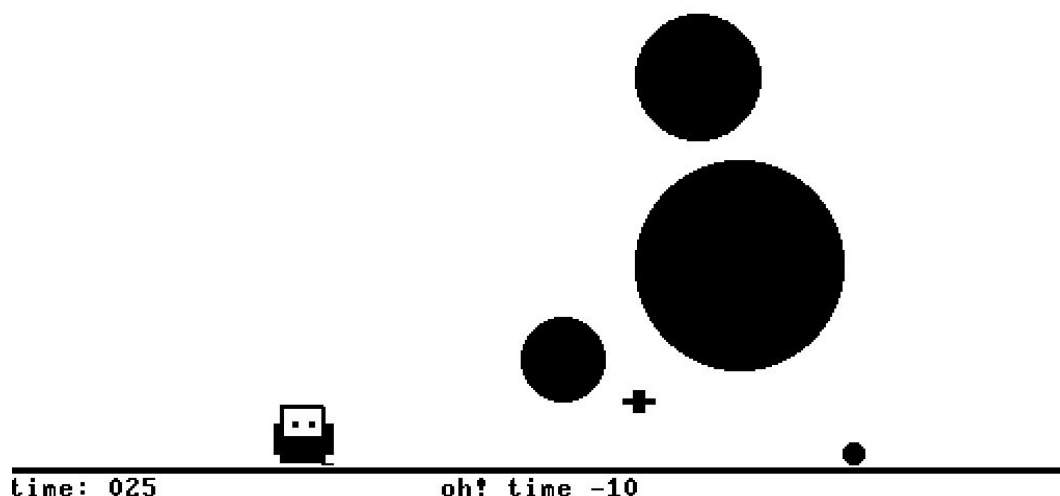
In the easy mode, there are three balls with different velocities and sizes. You might notice that there is a string showing "time: number" on the downside left, which records your alive time. Furthermore, after 10 seconds, there will be a "plus" shape object falling down. Try to approach it if you can. You can earn 10 seconds (time +10) as a reward if you reach its position. There will be another plus-shape object falling down once you eat the previous one. Try to survive without being killed by the aggressive balls and eat more plus-shape patterns to gain bonus points !!

### Game execution : medium mode



With respect to the easy mode, we add up a ball whose size is rather small but moving at an extremely large speed. Also, when the time reaches 50 seconds, there will be a warning text below showing that the time remains before the CRAZY mode. In the CRAZY mode, the speed of each ball will double, and provide a harsh and threatening condition for the player.

### Game execution : hard mode



The hard mode changes the effect of the plus-shape object, turning it to a negative effect. When you step on the object, you won't gain bonus points any more, but you will lose 10 time points as penalty, instead. It might seem as a slight alteration, but actually restricts your moving area very much.

# ball and ball



Level1  
Pass!

Level2  
Pass!

Level3  
Pass!

## New Challenge

As you achieve the threshold of each mode, then you will spot the screen above. Press "U" if you are looking forward to a fantastic challenge!

## Ultimate : The final trial

Within this mode, you will encounter five balls at the same time. In addition , "CRAZY mode" will soon begin, driving you crazy to avoid all the dying threats moving toward you. Do your best to unlock this mode and experience the most amazing part of this game !

## Code explanation

Following we will roughly go through some significant codes of our program. These codes were written in Jack language and with the source "Jack Compiler" , you can simulate the game in a VM emulator.

## Class ballgame

We start our game by creating a new ballgame object. Since there are three different levels, as well as the ultimate one, we create three more classes with similar construction, which are class "easy", "hard", "ultimate". So, there are four similar classes for the game. In these classes, we create the balls with varied parameters, which decide the position, velocity, and radius of the ball.

## **Class title**

At the beginning, the screen shows the name of the game by creating a new title object. Because there is no font setting for the printed string, we can only draw a larger English alphabet by ourselves. Also, we draw a bouncing ball as an index for the player to choose levels by the keyboard. As the player presses enter, the game starts. But there's still one thing left. After the main character survives in a certain time, there will be a string "pass!" added below the level. As the three levels are all passed, we draw a box in the middle of the screen. At the same time, the main character moves closer and closer to the box. After the player presses 'u' within the box exploding, the players can start the ultimate game.

## **Obstacles**

We faced some difficulties while making the game. We overcame some of them. However there are still some problems that remain unsolved.

1. We can't set the font of the string, so we decide to draw the alphabet by ourselves.
2. There's no built-in clock in the system. Finally, we came up with the idea that we can count how many times the main while loop runs. And it can be the clock for the program.
3. The objects in the game keep flashing. The solution is that we can erase a bit from one side of the object as well as draw a bit on the other side. Hence, the player will feel that the object is moving. However, it can only be used on the rectangle object, since it is quite complicated to do the same thing on a circle. So, the balls are still flashing in the game.