

# Department of Computer Science

## 08101 Programming 1

### Week 8 Practical 2007/2008

#### Pong Game

At this point you should have a ball moving around the screen. When the ball reaches the edge of the screen it should reverse its direction appropriately and bounce.

In this session you are going to add some paddles for the players to use to hit the ball.

#### Pong Class

Last week we created class called PongGame. The Main method in this class kept track of the pong ball and bounced it around the screen for us. Now we are going to change the organisation of the code and make the game data a member of the class, rather than being held inside the Main method.

```
using System;

class PongGame
{
    static int x=0;
    static int y=0;
    static int xSpeed = 1;
    static int ySpeed = 1;

    static void Main ()
    {
        Console.Clear();
        while(true) {
            Console.SetCursorPosition(x, y);
            Console.Write(" ");
            x = x + xSpeed;
            y = y + ySpeed;
            Console.SetCursorPosition(x, y);
            Console.Write("*");
            System.Threading.Thread.Sleep(500);
        }
    }
}
```

Pong05.cs

The code above uses members of the PongGame class to keep track of the position and speed of the ball. Note that these have been made static, so that they are members of the class and can be accessed from the Main method, which is also static.

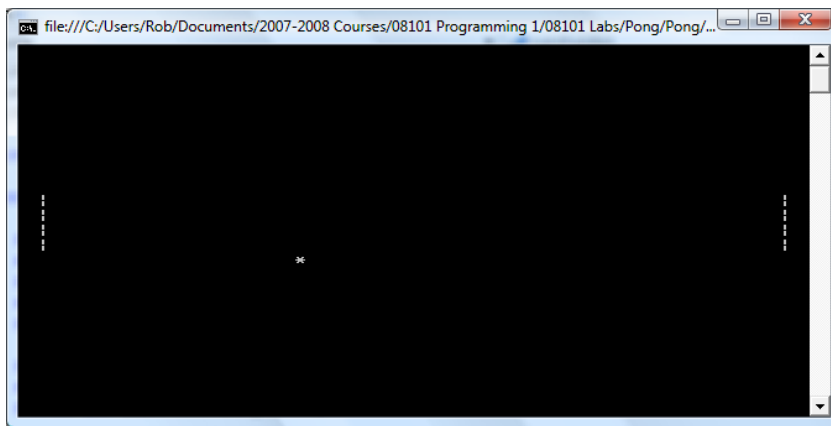


Before you go any further; perform the following:

1. Open your game and modify the arrangement of your code so that the data which controls the movement of the ball is held in members of the class rather than within the Main method.

## Pong Paddles

In the original version of Pong the position of the paddles was controlled by a knob which the player turned to move the paddle up or down. In this version we are going to use the keyboard. Each time the appropriate key is pressed a paddle is moved up or down a single step.



The bats can be made up of a number of vertical bar (|) characters which are drawn down the screen. The game must keep track of the position of the bat and its length:

```
static int leftPaddleX = 2;  
static int leftPaddleY = 10;  
static int leftPaddleLength = 4;
```

Note that these variables are members of the class and not held within the Main method.

The paddle itself is drawn starting at the “top” and then drawing down the screen the length of the paddle. Designing the game in this way means that the length of the paddle can be changed as the game progresses.

The code that draws the bat is a simple for loop:

```
for (int i = leftPaddleY; i < leftPaddleY + leftPaddleLength; i = i+1)  
{  
    Console.SetCursorPosition(leftPaddleX, i);  
    Console.Write("|");  
}
```



Before you go any further; perform the following:

2. Add code to draw the left hand paddle .

## Moving the Pong Paddles

We need to decide which keys will be used to move the paddles. We need keys for players on each side of the screen. In the version in this example I am going to use the A

and Z keys to move the left hand paddle up and down and the K and M keys to move the right hand one.



We can use these key values to update the paddle position by updating the switch that we created to stop the game:

```
case ConsoleKey.A:
    leftPaddleY = leftPaddleY - 1;
    break;
case ConsoleKey.Z:
    leftPaddleY = leftPaddleY + 1;
    break;
```

If the player presses A the paddle must be moved up, which we achieve by subtracting 1 from its Y coordinate. Remember that when y is zero this means the top of the screen, so decreasing the value of Y will cause the paddle to move up.



Before you go any further; perform the following:

3. Add the code to allow the player to move the bat up and down the screen.

If you start the game and try to move the paddle you will find that it doesn't look right. This is because the paddle must be erased before it is drawn in its new position. The erase code is very similar to the draw code, except that the paddle is drawn using spaces.



Before you go any further; perform the following:

4. Add the code to erase the paddle from the screen and allows the bat movement to be displayed correctly.

Note that for this version of the game the player will press the key each time they want the paddle to move. Later we will explore how you can move the paddle while a key is held down.

Next we need to add the second bat on the right hand side of the screen. This will be controlled by the other player and can work in exactly the same way as the left hand bat.



Before you go any further; perform the following:

5. Add the code draw a right hand paddle which can be controlled by the K and M keys on the keyboard.

## Pong Phase 2

At the end of this session you should have game which displays a bouncing ball and a pair of paddles which can be moved under player control. Next time we will add the final part of the game, allowing the ball to bounce off the paddles and also displaying the score.

Rob Miles November 2007