

Tutorial 7: Using arrays

<http://www.codemii.com/2008/09/28/tutorial-7-using-arrays/>

In this Wii programming tutorial we will quickly cover how we can utilise arrays for holding information about games like in card games or other games where the positions of objects remains static.

An array as you should know can hold multiple elements. By utilising these elements we can arrange them however we like. For example, if we were to do a tic tac toe game, we know there are 9 cells in 3 x 3. We can declare an array with 8 elements and set all those elements to 0 as shown below.

```
int cells[] = {0, 0, 0,
              0, 0, 0,
              0, 0, 0};
```

So we have our 9 cells, 0 is for empty, 1 could stand for a cross and 2 could stand for a circle. As you can see we haven't defined how many elements are in the array cells, because we are initialising the array whilst declaring it. Then all we need to do is display the crosses, circles and empty cells. I won't be providing the code but rather just providing some quick pseudocode.

Pseudocode is a way of writing code but in a briefer level where you don't need to care about writing the exact code, but rather paraphrasing what it will do.

Something like this will do:

```
For all elements of the cells array
  If element equals 1, display a cross
  Else if element equals 2, display a circle
```

Our code could then look something like this:

```
int x = 0;
for (x = 0; x <= 8; x++) {
  if (cells[x] == 1) {
    display_cells (x, 1);
  }
  else if (cells[x] == 2) {
    display_cells (x, 2);
  }
}
```

It's up to you how you derive the code from the pseudocode. So we now have some example code, although what I haven't shown you is the `display_cells` function.

The `display_cells` function could take the position in the array which is denoted by `x` and whether it's a cross or circle (1 or 2).

Our pseudocode could look like:

```
Initialise a temporary x and y position
If array position divided by 3 is more or equal to 1, add 100 to y position
    Use that divided figure and multiply by 100 to x position
Else multiply 100 to x position by the array position
If element equals 1, use x and y position and draw a circle
Else if element equals 2, use x and y position and draw a cross
```

What we are doing above is converting a number from 0 to 9 (the array position) to a certain position on the screen. Say we have the number 5 as the array position; we divide 5 by 3 which is about 1.67. As this figure is more than 1, we add 100 to the y position to move it down to the next row and then multiply the remaining result (2) by 100 so it will end up in the centre of the screen. We then check to see if the element is a 1 or 2 and then display the cross or circle.

The next thing you would have to do is how to select cells with the Wiimote. From our previous tutorials we know how to do this. So we just need to split all 9 cells into buttons. As the cells positions remains the same, we can apply a formula to working out which cell we are clicking on.

It's similar to the formula above. If we moved our cursor to say 130 x and 160 y, it would fall right in the centre. All we need to do is divide both the x and y by 100 and we have a single digit value with our x and y values which would give us 1 x and 1 y (remember 0 x and 0 y is the top left cell). So then we just need to do $y * 3 + x$ and we have our position in the array which would be 4.

Now all you would need is the graphics, the 3 way cross/circle detection, simple AI, a function to restart the game and you should be set.