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# More on using 2d Arrays

## COMP 102

Victoria University of Wellington

# Processing 2D arrays

- Typically use nested **for** loops to process each item

```
public void printTable( String[ ][ ] grades){
    for (int row=0; row< grades.length; row++){
        for (int col=0; col< grades[row].length; col++){
            UI.printf(" %-2s ", grades[row][col]);
        }
        UI.println();
    }
}
```

'-' flag means  
left justified

A+	B-	A-	B
B+	C	A	B-
A	D	A+	A
A-	B+	B+	B
A	A-	C+	C+

```
public void printTable( String[ ][ ] grades){
    for (String[ ] row : grades){
        for (String grade : row){
            UI.printf(" %-2s ", grade);
        }
        UI.println();
    }
}
```

If not modifying the array,  
can use foreach loops, but  
must be careful!

# Drawing a 2D array

```

public void drawBoard(ChessPiece[ ][ ] board){
    int rows = board.length;
    int cols = board[0].length;
    for (int row=0; row<rows; row++){
        int y = TOP + SIZE*row;
        for (int col=0; col<cols; col++) {
            int x = LEFT + SIZE*col;
            UI.setColor( (row%2==col%2) ? Color.gray : Color.white);
            UI.fillRect(x, y, SIZE, SIZE);
            if (board[row][col] !=null) {
                board[row][col].draw(x, y);
            }
        }
    }
    UI.setColor(Color.black);
    UI.drawRect(LEFT, TOP, SIZE * rows, SIZE * cols);
}

```

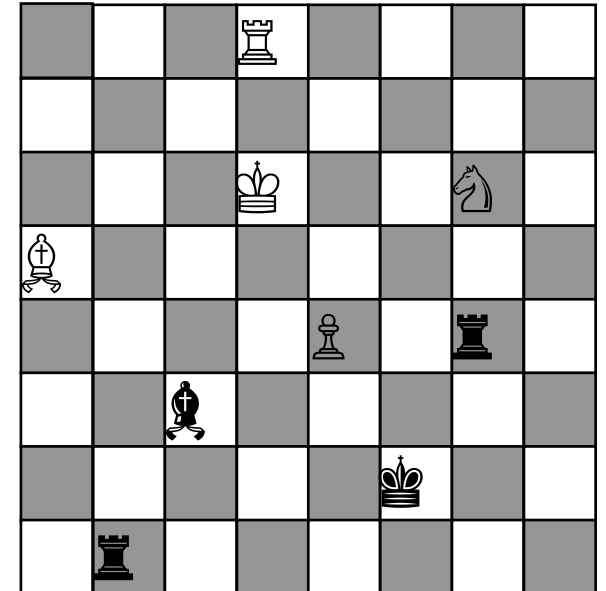
Shorthand for:

```

if (row%2==col%2) {
    UI.setColor(Color.gray);
}
else {
    UI.setColor(Color.white);
}

```

Make ChessPiece  
draw itself

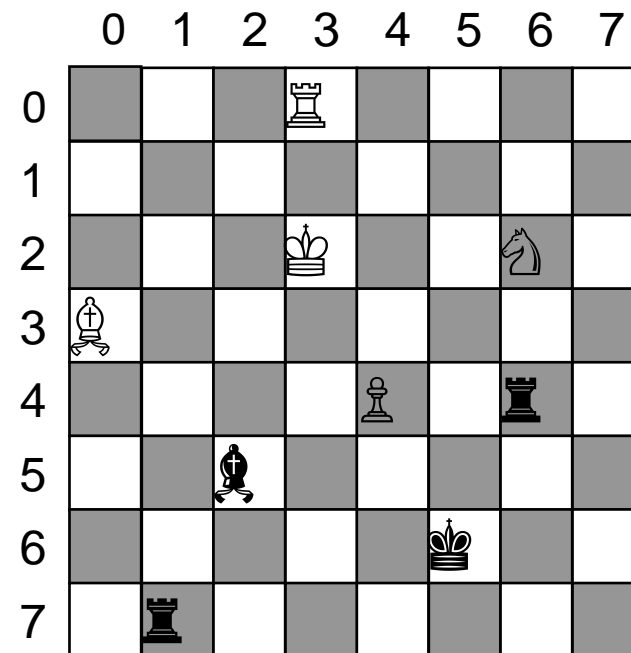


# Moving value in a 2D array

```

public void moveUp(ChessPiece[ ][ ] board, int row, int col){
    if ( row > 0 && row < board.length
        && col >= 0 && col < board[row].length
        && board[row][col] != null
        && board[row-1][col] == null ) {
    board[row-1][col] = board[row][col];
    board[row][col] = null;
    }
}

```



# Moving all values in a 2D array

```

public void flipBoard(ChessPiece[ ][ ] board){
    int rows = board.length;
    int cols = board[0].length;
    for (int row=0; row<rows/2; row++){
        for (int col=0; col<cols; col++) {
            ChessPiece temp = board[row][col];
            board[row][col] = board[rows-1-row][col];
            board[rows-1-row][col] = temp;
        }
    }
}

```

