# Data Type Review

## COMP3220 – Principle of Programming Languages

### 2016 Spring

## 1 Concepts

1. Given a 2-dimensional matrix

$$\begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix}$$

   Suppose we store multidimensional array in single block of contiguous memory, i.e., in a long 1D array fashion.

   (a) If we use *row major order* to fatten the 2D array, what does look like in memory?

   (b) If we use *column major order*, what does it look like?

2. Briefly describe the *tombstone* method.

   (a) What is it used for?

   (b) Describe the advantages and disadvantages.

3. Describe the two commonly used mechanism to determine whether two types are equivalent. And show me examples for both in `C++`.

## 2 Show Me Your Code

Given a *single precision* floating number in IEEE 754 format (i.e., `float` type), print out its sign bit, exponent and fraction. See the zip file for start-up code.

# 3 Deliverable

For question in Section 1, please submit a doc file (doc, docx, pdf or txt). For the coding problem in Section 2, please submit a zip file including your modified cpp file.