A1055548 謝豐安 HW2

Analyze the space complexity:

(1). The 2-dimensional array representation

We need a 2-dimensional array to represent a sparse matrix , if the size of sparse matrix is m\*n , then we need to create a m\*n-size of 2-dimensional array , having m\*n elements.

So , the space complexity of 2-dimensional array representation is n\*m.

(2).Transpose method

We need a struct to store {row , col , value} ,total 3 elements, then use a array to store them if the size of non-zero terms of sparse matrix is n.

So , the space complexity of Transpose method is 3\*n.

(3).Fast transpose method

We have some space is the same with Transpose method , but we have extra array RowSize and RowStart 1-dimensional array, and their size is non-zero terms , if in sparse matrix have k non-zero terms.

So , the space complexity of Fast transpose method is 3\*n+2\*k.

心得:

　　很久沒有寫物件導向風格的程式，剛開始連物件的分類都有點頭昏腦脹，而且對C++的class的規定方面也不熟悉。但寫久了發現物件導向其實很適合開發大型程式，對每項東西都清楚規範它的存取範圍、物件屬性、物件歸屬等，多型也是一項好用的工具，讓每個繼承父類別的子類別有屬於自己的實作內容。

　　在撰寫Transpose method 方面，覺得Fast transpose 雖然稍微複雜，但在轉換上的效率大部分的情況都很好，使用空間也不會比一般的transpose 多很多。