Homework 0 曼哈頓距離

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Task3：外送員

> Sorce Code以及Replit網址
>
> - 手動輸入座標終端機輸出

```cpp
#include <cmath>    //pow(), sqrt()
#include <iostream> //std::cout, std::cin
#include <vector>   //std::vector

bool getUserInput(double &out_x, double &out_y) {
  // get user input and store into out_x and out_y by reference
  // returns false when user input is 0 0
  // otherwise returns true
  std::cout << "Input the coordinates of the destination" << std::endl;
  std::cout << '\t';
  std::cin >> out_x >> out_y;
  return !(out_x == 0 && out_y == 0);
}

struct Stats {
  int count;
  double in_x, in_y, distance;
};
```

```
> sh -c make -s
> ./main
Student B10831020
Delivery person takes unlimited orders until input 0 0
Input the coordinates of the destination
    15 64
    The distance from origin (0, 0) to (15, 64) is 79
Input the coordinates of the destination
    23 55
    The distance from origin (0, 0) to (23, 55) is 78
Input the coordinates of the destination
    14 87
    The distance from origin (0, 0) to (14, 87) is 101
Input the coordinates of the destination
    22 33
    The distance from origin (0, 0) to (22, 33) is 55
Input the coordinates of the destination
    -89 74
    The distance from origin (0, 0) to (-89, 74) is 163
Input the coordinates of the destination
    0 5
    The distance from origin (0, 0) to (0, 5) is 5
Input the coordinates of the destination
    0 0
The shortest distance is 5 from (0, 5)
```

> - 自定義`struct Stats`存放每筆輸入資料

```cpp
struct Stats
{
   int count;
   double in_x, in_y, distance;
};
```

> - 用`vector<Stats>`儲存每筆輸入與距離，可以容納無數筆輸入
> - 當輸入為`0 0`結束程式並顯示最短距離與出發座標
> - 利用pass by reference從函式輸出變數值

```cpp
bool getUserInput(double &out_x, double &out_y)
{
   //get user input and store into out_x and out_y by reference
   //returns false when user input is 0 0
   //otherwise returns true
   std::cout << "Input the coordinates of the destination" << std::endl;
   std::cout << '\t';
   std::cin >> out_x >> out_y;
   return !(out_x == 0 && out_y==0);
}
```

> - 以`while(getUserInput(x, y))`持續接收使用者輸入。當使用者輸入0 0, `getUserInput`函式將return false中止while迴圈。

心得

> 嘗試使用struct存放每一筆輸入值，然而對其用法相當不熟悉。原本想call它的default constructor，初始化struct

```
userInput thisInput = userInput(x, y, count, distance)
```

> 卻產生錯誤。只好一個個attribute個別賦值，寫出相當冗贅的程式。

```
thisInput.x = x;
thisInput.y = y;
thisInput.count = count;
thisInput.distance = distance;
```

> struct的用法似乎跟class仍不盡相同，或是其實我在這之中寫錯了有所誤會。開始寫c++後才漸漸理解為何現今多個程式語言朝物件導向的語法發展。畢竟像c一樣的語法實在不太平易近人。
>
> 很高興自己事先已經會操作vscode，設置開發環境與compiler。Vscode實在是很方便使用的文字編輯器，除了寫程式，寫markdown也很輕鬆。