

1. (50 points) 寫出泡沫排序演算法 (bubble sort) 的虛擬碼 (pseudo code) 和畫出其流程圖 (flowchart).

虛擬碼：

Input: an array $a[n]$.

Output: elements of $a[n]$ in ascending order.

1. Set i to be the length of the entire sequence.

2. While $i > 1$ do

2.1. $inx = 0$;

2.2. $j = 1$;

2.3. While $j < i$ do

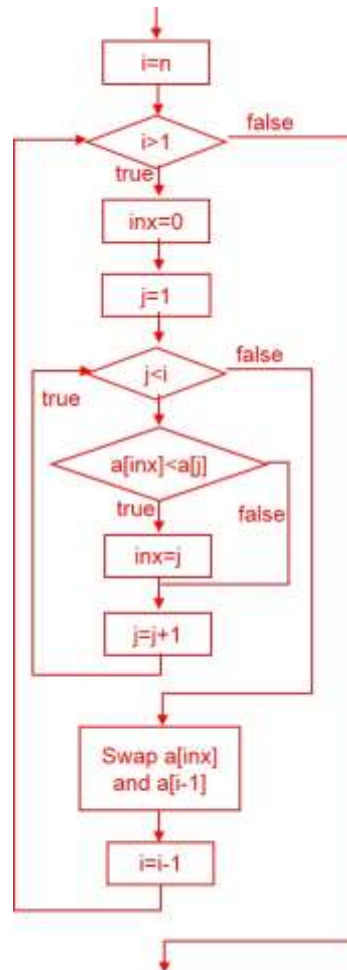
2.3.1. If $a[inx] < a[j]$ then $inx = j$;

2.3.2. $j = j + 1$;

2.4. swap $a[inx]$ and $a[i-1]$

2.5. $i = i - 1$;

流程圖：



2. (25 points) 考慮下列 C 程式語言的陣列宣告 (array declaration) :

```
double s[10][8];
```

假設此陣列的起始位址(starting address)為 0X0028FCC0. 寫出下列 printf 的輸出結果 :

- (a) printf("%d\n", sizeof(s));
 - (b) printf("%d\n", sizeof(s[5]));
 - (c) printf("%08X\n", s[5]);
 - (d) printf("%08X\n", s[5]+4);
 - (e) printf("%08X\n", &s[5][6]+1);
- (a) 640
(b) 64
(c) 0X0028FE00
(d) 0X0028FE20
(e) 0X0028FE38

3. (25 points) 考慮下列 C 語言的結構型態宣告 (structure type declaration) 及變數宣告 (variable declaration),

```
typedef struct {  
    unsigned char tid[9];  
    struct {  
        int m_day; int m_month; int m_year;} make_date;  
    char item_name[20];  
    char color[3];  
    float price;  
    int weight;  
} thing;  
thing abc[20];
```

假設 abc 的起始位址(starting address)為 0X0028FA40, 寫出下列 printf 的輸出結果 :

- (a) printf("%d\n", sizeof(abc));
 - (b) printf("%d\n", sizeof(abc[10]));
 - (c) printf("0X%08X\n", &(abc[3].make_date.m_month));
 - (d) printf("0X%08X\n", &abc[3].color);
 - (e) printf("0X%08X\n", &abc[3].price);
- (a) 1120
(b) 56
(c) 0X0028FAF8
(d) 0X0028FB14
(e) 0X0028FB18