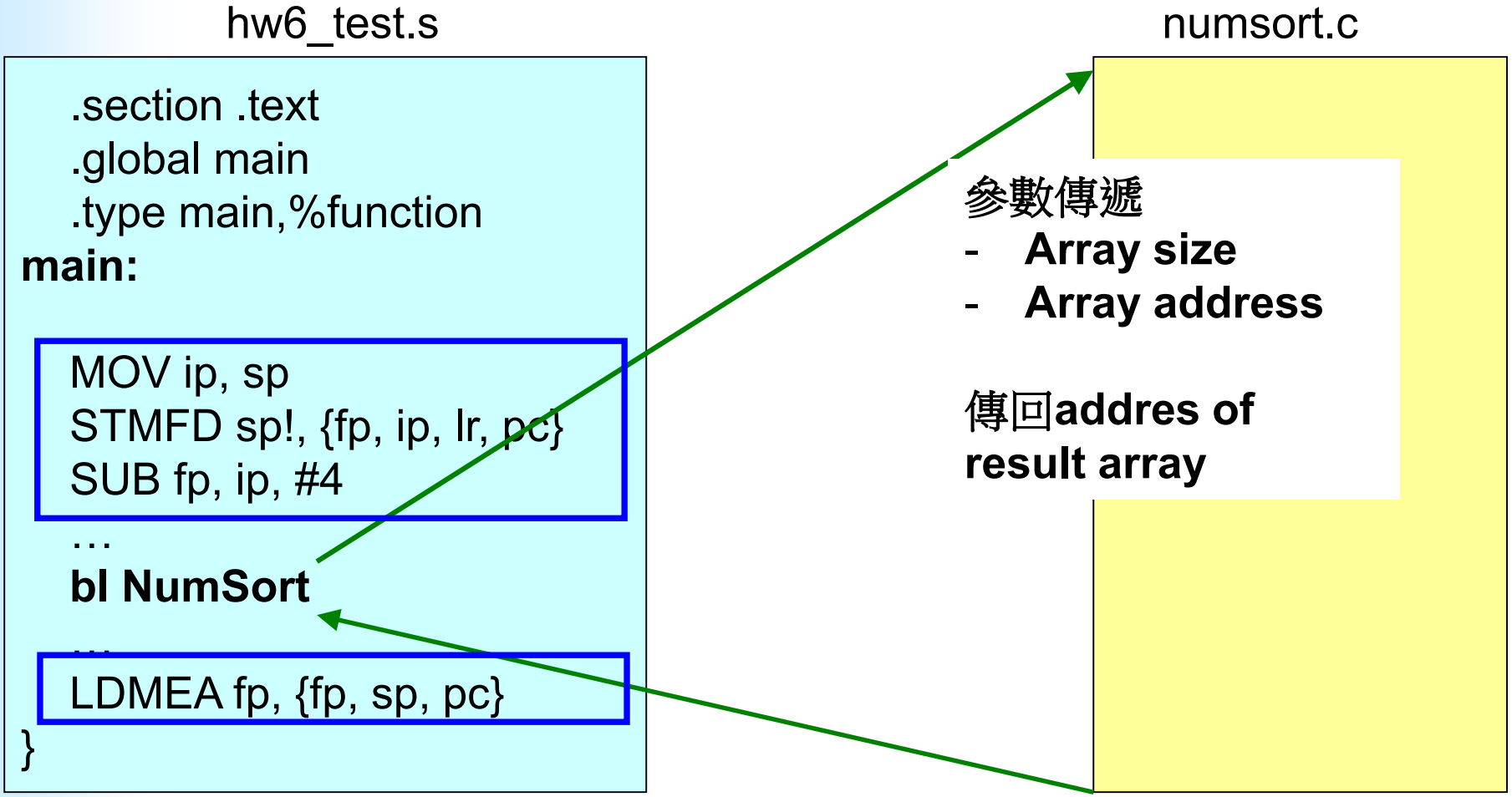
Homework #6 (1)

- Write a **C function NumSort** to sort an integer array from the biggest to the smallest.
- Two arguments will be passed into your function by stack

```
int* NumSort(int, int*)
```

  - **Array size**
  - **The address of the first element in array**
  - The result array in which each element is sorted from the biggest to the smallest. (原來的integer array裡的沒有被修改，只是讀取原integer array，並排序好的結果存放於result array)

An ARM assembly program calls the sorting procedure to demo your sorting algorithm.



hw6_test.s

```
    .section .text
    .global main
    .type main,%function
main:
    MOV ip, sp
    STMFD sp!, {fp, ip, lr, pc}
    SUB fp, ip, #4
    …
    …
    …
    bl NumSort
    …
    …

    LDMEA fp, {fp, sp, pc}
}
```

- 呼叫C function產生測試的integer array
- Ex: malloc(), srand(), …

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}
```

- 透過semihosting，使用”SWI #0x123456”將result array輸出到result.txt (純文字檔)
  - 包含開檔、寫入檔案等操作都需要使用semihosting
- 須留意 result array為integer，但檔案寫入是字串，需要適當的轉換。
  - Ex: sprintf()

Homework #6 (2)

- 請參閱chapter 3.7: C and ARM assembly program投影片。
- 請參閱chapter 3.5: SWI using GAS投影片。
- Ex: an integer array=[1,10,6,3,20,40,9]

  result.txt: **40, 20, 10, 9, 6, 3, 1**

How to Compile Your Program?

- $arm-none-eabi-gcc –g hw6_test.s numsort.c –o hw6.exe

Homework #6 (3)

- Program should be assembled and linked by gcc
  - 使用於作業一所安裝完成的cross toolchain.
- Program should be executed under **GDB ARM simulator**
- 程式中應有適當的說明（註解）
- You should turn in to **ECOURSE2**
  - "**README.txt**" file: 文字檔，描述你程式的內容、呼叫了那些C function、如何編譯程式、如何執行你的程式
  - Your sorting procedure，**檔名為：numsort.c**
  - An ARM program which uses your NumSort procedure，**檔名為：hw6_test.s**
  - Makefile / any file needed in your work
  - 請將欲繳交的檔案壓縮成 <**hw6_學號.tar.bz2**>，上傳壓縮檔
- **Deadline: December 14 (Monday), 2020**