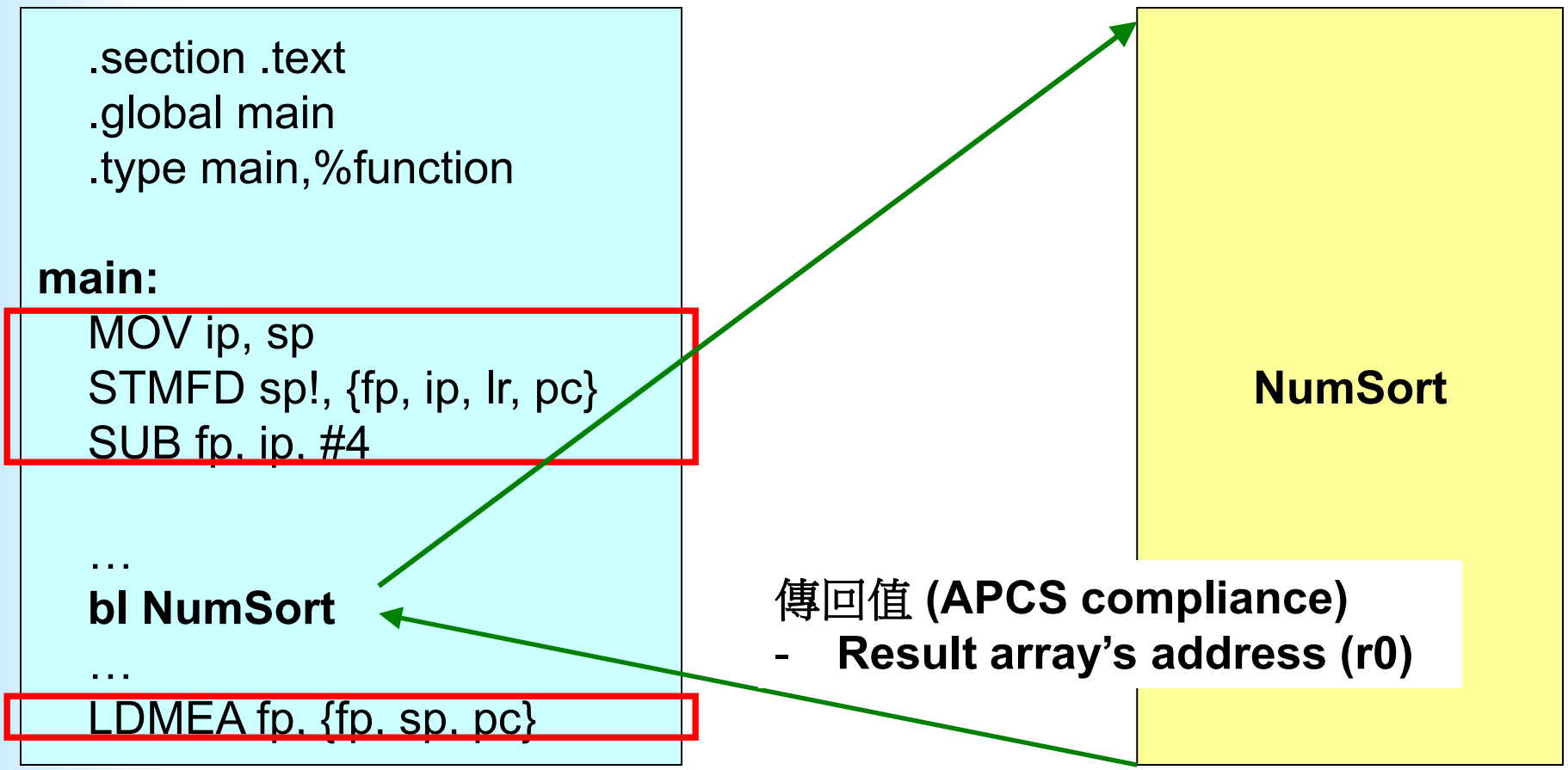
Homework #6 (1)

- Write a function called **NumSort** to sort an integer array from the smallest to the biggest.
- APCS compliance
- Two arguments will be passed into your function
  - **Array size**
  - **The address of the first element in array**
- **The result of NumSort**
  - The result array in which each element is sorted from the smallest to the biggest. (原來的integer array裡的值沒有被修改，只是讀取原integer array，排序好的結果存放於**result array**)
- Return value: the address of the result array.

參數傳遞 (APCS compliance)

- **Array size (r0)**
- **Array address (r1)**



hw6_test.s

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

      /* prepare input array */
      …


        /* put array size into r0 */
        /* put array address into r1 */

        bl  NumSort
        /* --- end of your function --- */

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

- array size => r0
- array address => r1

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```
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        .end
```

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。
- 請參閱範例程式。
- Ex: an integer array=[1,10,6,3,20,40,9]

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

How to Compile Your Program?

- $arm-none-eabi-gcc –g hw6_test.s numsort.s –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.s**
  - 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 22 (Wednesday), 2021**