

Homework #3

In this homework, you need to write an ARM assembly program for matrix computation. The program is expected to execute on GDB ARM emulator for the verification.

Write an ARM assembly program to do the dot product of two 1x10 vectors.

- A is a 1x10 vector, $[a_1 \ a_2 \ a_3 \ \cdots \ a_{10}]$
- B is a 1x10 vector, $[b_1 \ b_2 \ b_3 \ \cdots \ b_{10}]$
- A and B are stored in row-major layout.
- $C = A \cdot B = a_1 \times b_1 + a_2 \times b_2 + a_3 \times b_3 + \cdots + a_{10} \times b_{10}$
- Figure 1 shows the layout of A and B.
- Each element in A, B, and C is a **word-sized** signed integer.
- Write an ARM assembly program to compute C.
- 程式碼應該加上適當的註解.
- The integer values of A and B are assigned by yourself.
- The overflow/underflow problems are not considered during the computation.
- After computation, **register r0** will have the value of $A \cdot B$.
- 請勿繳交【利用編譯器所自動產生的組合語言程式】
- 請勿抄襲

You need to turn in the following files to **eCourse2 system**

(<http://ecourse2.ccu.edu.tw/>):

1. “**README.txt**” file describes the features in your program and how to compile and run your program.
2. Your ARM assembly program, named hw3.s, with **proper comments**.
3. Executable code: hw3.exe
4. Makefile
5. Any other files are required in your implementation.
6. 請將欲繳交的檔案壓縮成 **<hw3_學號.tar.xz>**，上傳壓縮檔

Due Data: October 27 (Sunday), 24:00, 2024

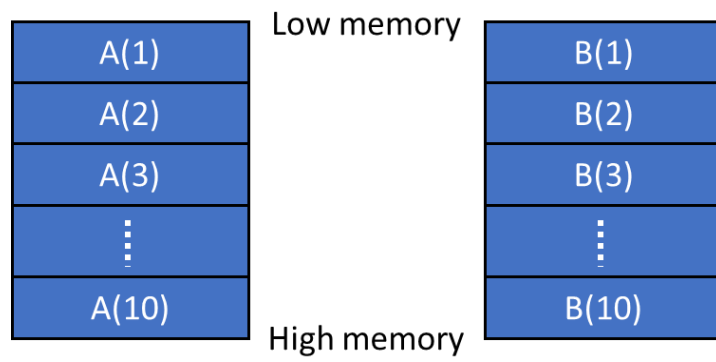


Figure 1: Layout of the vectors A and B.