**Exercise Set 1**. EE5167, Aug-Dec 2023.

Date: 24/08/23. Submission date: 31/08/23.

The exercise set will not be marked, but can be used in quizzes and the final exam.

You can use the cpu emulator discussed in the class (<https://cpulator.01xz.net/?sys=arm>) or <https://salmanarif.bitbucket.io/visual/>.

1. Find the smallest of three given numbers. Store these numbers using:

|  |  |
| --- | --- |
| 1 | DCD 0x91258465 0x102C2056 0x70409254 |

Then the output should be in register r0: 0x102C2056

2. Find the sum of squares for a series of integers. Their total number n and values are located at a given memory location, e.g.

Data DCD 0x5 0x1 0x2 0x3 0x4 0x5

3. Use a function to add two 64-bit numbers stored as in exercise 1 above.

4. Define two functions. Each of these functions adds 1 to the input argument and then calls the other function. A function exits if the input argument is greater than 10. Start with a call using argument 1. Use stack to allocate space for the functions.

5. Write ARM assembly for the following function:

|  |  |
| --- | --- |
| 1  2  3 | void bcopy(int \*to, int \*from, int n) {  while (n--) \*to++ = \*from++;  } |

Use multi register copy instructions (stmfd, ldmfd) as well as conditional execution for optimisation. For loop unrolling, use multiple stmfd/ldmfd instructions in a single loop.