

## Computer Architecture - CS2323. Autumn 2022

### Lab-1 (Basic assembly programming)

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The programs need to be implemented and submitted during the lab hours only.

1. Write an assembly program using RISC-V instructions to add 10 integers. The numbers are present in contiguous memory locations starting at 0x10000000 and are of size 8 bytes each. The final sum should be present in register x10. Use of any other register is as per your choice. Use only `add` and `ld` instructions for implementation.

The following code template can be helpful.

```
.data
#The following line defines the 10 values present in the memory.
# We would use different values in our evaluation and
# hence you should try various combinations of these values in your testing.
.dword 1000, 1001, 1002, 1003, 1004, 1005, 1006, 1007, 1008, 1009
#(dword stands for doubleword)

.text
#The following line initializes register x3 with 0x10000000
#so that you can use x3 for referencing various memory locations.
lui x3, 0x10000
#your code starts here

#  WRITE YOUR CODE HERE

#The final result (sum) should be in register x10
```

Instructions:

1. Use Ripes simulator from:  
[https://github.com/mortbopet/Ripes/releases/download/v2.2.4/Ripes-v2.2.4-linux-x86\\_64.AppImage](https://github.com/mortbopet/Ripes/releases/download/v2.2.4/Ripes-v2.2.4-linux-x86_64.AppImage)
2. Configure simulator for 64-bit processor (click on the processor button below File in the top-left and select 64-bit single cycle processor).
3. While doing this exercise, try to use breakpoints, single stepping, etc. features of the simulator for a better understanding. We will need these features when debugging the programs in subsequent assignments. Also, see the corresponding disassembled (translated) code in the right pane.

#### **Submission instructions:**

Submit the assembly code as a file named YOUR\_ROLLNUM.s (e.g., CSYYBTECHXXXXX.s)