**Activity 2: Central Processing Unit (Part 2)**

**Group No :**

**Group Member :**

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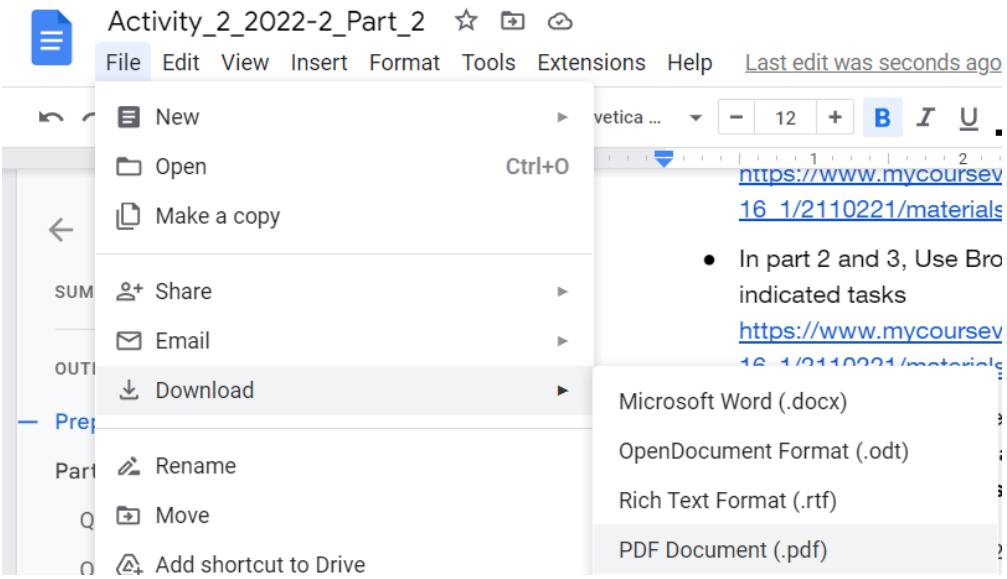
# Preparation

- In part 1, use Activity 2 Reference: SML Instruction Set, which can be downloaded from myCourseVille or the link below: https://www.mycourseville.com/sites/all/modules/courseville/files/uploads/2016_1/2110221/materials/sml_instruction_set.333.1471674877.pdf
- In part 2 and 3, Use Brookshear Simple Machine Emulator to perform the indicated tasks https://www.mycourseville.com/sites/all/modules/courseville/files/uploads/2016_1/2110221/materials/bme.333.1471675276.htm
- Make a copy of this sheet. Answer the questions in the boxes given. After finishing, **save this file as a PDF** and **submit it to the assignment published on myCourseVille**.



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# Part 2 : Playing with Emulator (8 Questions)

Once you finish this part, students must inform instructors or TAs for inspection.

Suppose the CPU is started with PC=0 and the following values in cells 00-0F and F0-F2 in memory.

| Address | Content |
|---|---|
| 00 | 10 |
| 01 | F0 |
| 02 | 11 |
| 03 | F1 |
| 04 | 12 |
| 05 | F2 |
| 06 | 23 |
| 07 | 01 |
| 08 | 54 |
| 09 | 03 |
| 0A | 55 |
| 0B | 41 |
| 0C | 56 |
| 0D | 52 |
| 0E | 57 |
| 0F | 66 |
| 10 | 37 |
| 11 | F3 |
| 12 | C0 |
| 13 | 00 |

| Address | Content |
|---|---|
| F0 | 02 |
| F1 | 03 |
| F2 | 05 |

Start the program using the “step” button until it completes the first machine cycle (fetch -> decode -> execute).

**Question 2.1 At this point, what is the value stored in:**

| | |
|---|---|
| PC | 02 |
| IR | 10F0 |
| R0 | 02 |

**Question 2.2 Execute a single machine cycle again, Record the changes in the registers.**

| | |
|---|---|
| PC | 04 |

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| | |
|---|---|
| IR | 11F1 |
| R1 | 03 |

**Question 2.3 Execute a single machine cycle again, Record the changes in the registers.**

| | |
|---|---|
| PC | 06 |
| IR | 12F2 |
| R2 | 05 |

**Question 2.4 Execute a single machine cycle again, Record the changes in the registers.**

| | |
|---|---|
| PC | 08 |
| IR | 2301 |
| R3 | 01 |

**Question 2.5 Execute a single machine cycle again, Record the changes in the registers.**

| | |
|---|---|
| PC | 0A |
| IR | 5403 |
| R4 | 03 |

**Question 2.6 What is the PC value when the program changes the value in Register 6?**

| |
|---|
| 0E |

## Activity 2: Central Processing Unit (Part 2)

**Question 2.7 After the program ends, what value does the program store in memory cell F3?**

```
16
```

The value in memory cell F3 depends on what is initially stored in cells F0-F2; experiment by starting the machine with different values in those cells, trace the execution of the program step by step, and determine what is being computed

**Question 2.8 What is being computed?**

```
Add all value from Address F0 to F2 and add with 1, Then store in
register 6 and Bring the value in register 6 multiply by 2 and
store this value to address F3
```

*— THIS IS THE END OF PART 2 —*

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