RAMAIAH
Institute of Technology

Data Sheet

MARKS: 10

Name:	KAUSTUBHA.D.S	Branch:	C.S.E
USN/Roll No:	1MS18CS058	Sem/Sec:	4-B
Subject:	COA-LAB	Subject Code:	

1) Write the detailed procedure to assemble a system.

A. * Before you start building a PC you need to get your workspace ready (parts & tools)
Tools such as:
* Screw drivers
* Thermal paste
* Zip ties for cable management.

* THE CPU: Release the tension lever on the CPU so that you can drop the processor into the socket. The arrow/triangle on the top of the CPU needs to line up with 1 on the socket or the socket cover. Once you have the CPU settled correctly in the socket press the tension lever back down.

* Cooler:
The stock cooler comes with thermal paste. Stock coolers for Intel processors use push pins that go through holes in the motherboard. We recommend pushing opposite corners in to evenly spread the thermal paste & to keep from putting uneven pressure on side of the CPU.

* RAM: First, make sure that latches for each memory slot are open. Then look at each DIMM and position it over the slot. Then push down on the DIMM on each edge until it snaps into place, causing latches to close.

* Cabinet: Open the case and mount the power supply which is M-ATX type. Attach the MainBoard back plate to the case and check Main board mounting positions. Suitably positions the Main board in the case.

* Harddisk: Mount the harddisk & connect it to the power supply and mother board. There should be seperate connections for the power supply & mother board. Connect the 20 pin ATX connector & the 4 pin power supply connector to the mother board. Mount the DVD-ROM drive. Install the OS of your choice to complete the assembling of the system.

2) Explain how trouble shooting a system helps to trace & correct the failure in the system.

A. * Verify that something is actually wrong: A problem usually is indicated by a change in equipment performance or product quality. Verification of the problem will provide you indications of the cause of the problem.

* Identify and locate the cause of the trouble: Trouble is often caused by a change in the system.

A thorough understanding of the system, its modes of operation and how the modes of operation are suppose to work

* Correct the problem: Its very important to correct the cause of the problem, not just the effect or the symptom. This often involves replacing or repairing a part of making adjustments.
* Verify that the problem has been corrected: Repeating the same check that originally indicated the problem can often do this. If the fault has been corrected the system should operate properly.
* Follow up to prevent further trouble: Determine the underlying cause of the trouble. Suggest a plan to a supervisor that will prevent a future recurrence of this problem.

3) List out the procedure to install extra memory card to a system.

A) Generally speaking there are 4 steps:

Step 1: Disconnect the power cable from the system and if needed, unplug other back-panel cables so that you can safely turn your system on to its side.

Step 2: Remove the side panel to give you full access to the interior and locate the RAM slots. They are most commonly found next to the processor and its cooler. If theres already RAM in your system, eject it by

pressingly firmly on the tabs on the mother board. at either end of the slots. The memory sticks will pop out and you can remove them gently:

Step 3: To install the new RAM, line up notches in the bottom of the sticks with gap in the slot on the motherboard. Make sure the wings at either end of slot are pushed back, so that they are titled away from the RAM. As it does the wings will clamp in and hold the memory accurately.

Step 4: Once the sticks have clicked into places confirm that the wing clipers are locked in to hold the sticks firmly in their slots and then close the PC backup. Plug all the cables back in and try to boot the system.

4) With a neat diagram explain difference between different cables used to connect functional units in a system.

A) 1) VGA Cable: Also known as D-sub cable, analog video cable. Connect one end to computer monitor, television, connect other end to VGA port on the computer.

2) DVI cable: Connect one end to the computer monitor. Connect the other end to DVI port on the computer.

P.T.O.

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3. HDMI Cable : Connect one end to computer monitor, television. Connect other end to the HDMI port on computer.

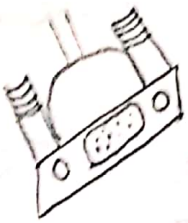
4. PS/2 cable : connect one end to PS/2 keyboard, PS/2 mouse. Connect other end to PS/2 ports on computer. Purple PS/2 port : keyboard. Green PS/2 port : mouse.

5. Ethernet Cable : Connect one end to ethernet port on computer.

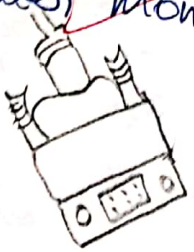
6. USB cable : Connect one end to USB device connect other end to ethernet port on computer.

7. Computer Power Cord (Kettle Plug) : Connect one end to AC power socket. Connect other end to power supply unit, computer monitor.

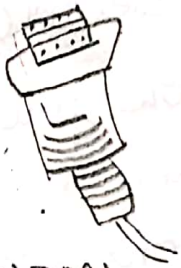
Diagrams:



1. VGA cable



2. DVI cable



3. HDMI cable

4 PS/2 cable

5 Ethernet cable

6 USB

7. Computer Power cord (kettle plug)

5) Discuss the safety precautions one should take while removing components of a system.

A) A few warnings and reminders before you start disassembling your computer to keep your unit and yourself safe are:

* Fully shut down and unplug the computer before you make any attempts to dissemble the power.
* Take off any metal objects on your arms or fingers such as bracelets, rings or watches. Even if your unit is unplugged, there may still be some remaining electric charge.
* Make sure your hands are completely dry to avoid damaging any mechanical parts as well as to avoid electrocution.

* Work in a cool area to avoid perspiration for the same person as seen in the previous number.
* Before touching any part within the tower put yours against another metal surface to remove static charge, which may damage sensitive devices.
* Prepare a place to keep any screws you may remove. A container or piece of paper with labels for each part is ideal to avoid confusion between the similar looking screws.
* Handle all parts with care. Place each piece you remove carefully down onto a stable surface.
* If a component does not come out easily, do not forcefully remove it.
* Be careful when handling the motherboard.
* Never attempt to remove the power source, a box attached to the side or bottom of the unit which all cables are connected.
* When removing any cables, wires or ribbons make sure to grasp the wire at the base or head to keep it from breaking.

* Take note that the three most damaging things to a computer are moisture, shock and dust.
* Be careful not to drop any small parts into unreachable areas such as into the computer fan or disk.

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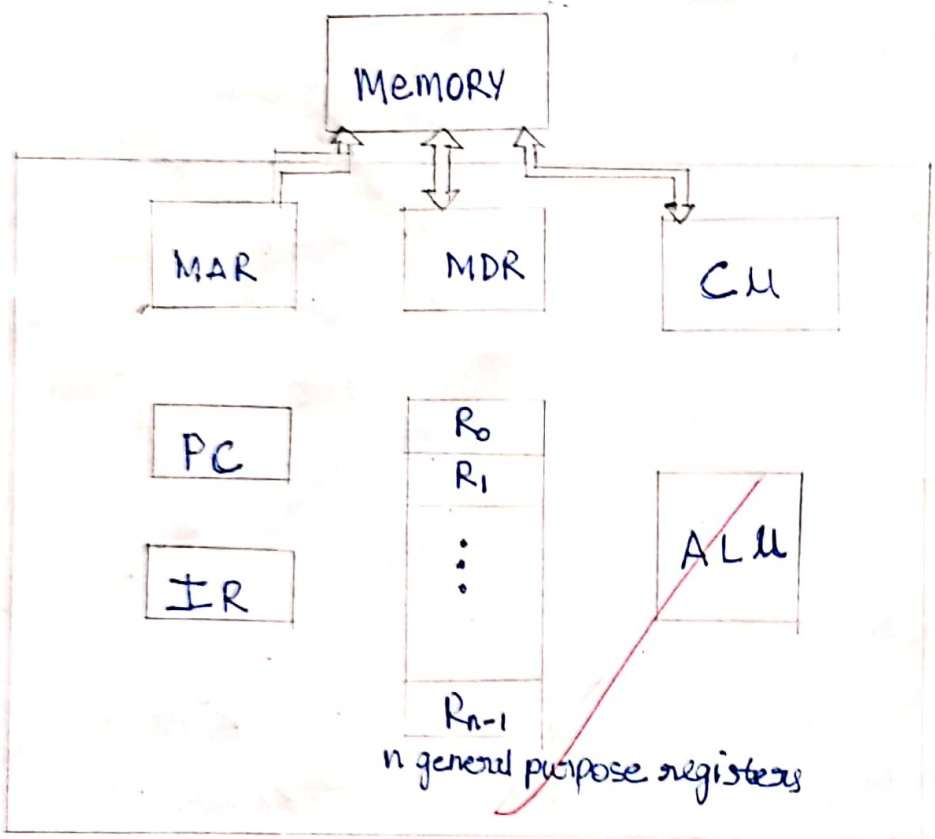
USN/Roll No. :	1MS18CS058	Sem/Sec:	4 - B
Subject :	COA-LAB	Subject Code:	

1) Draw the interconnection between memory and the processor.

A.



2) Write the steps required to be executed for an instruction.

A) The steps required to be executed for an instruction are:

1) Fetch instructions.

P.T.O

ii) Decode instruction
iii) Perform ALU operation
iv) Access memory
v) Update Register File
vi) Update Program Counter.

3) Write and execute the assembly language program to compute:

i) $f = (g+h) * (i+y)$

```
      LOAD G
      ADD H
      STORE A
      LOAD I
      ADD Y
      STORE B
LOOP  LOAD A
      ADD F
      STORE F
      LOAD B
      SUBT one
      STORE B
      SKIPCOND 400
      JUMP loop
      LOAD F
      OUTPUT
      HALT
G     DEC 9
H     DEC 5
Y     DEC 8
I     DEC 2
A     DEC 0
B     DEC 0
F     DEC 0
one   DEC 1
```

ii°) $d = b^2 - 4ac$

```
LOAD B
STORE D
first LOAD B
  ADD X
  STORE Y
  LOAD D
  SUBT one
  STORE D
  SKIPCOND 400
  JUMP first
second LOAD A
  ADD Y
  STORE Y
  LOAD C
  SUBT one
  STORE C
  SKIPCOND 400
  JUMP second
third LOAD four
  ADD Z
  STORE Z
  LOAD Y
  SUBT one
  STORE Y
  SKIPCOND 400
  JUMP third
LOAD D
ADD X
SUBT Z
OUTPUT
HALT
A DEC 6
B DEC 3
C DEC 2
D DEC 0
X DEC 0
Y DEC 0
Z DEC 0
one DEC 1
four DEC 4
```

4) Describe the factors affecting the performances of a processor.

A) i) Hardware: For the best performance, we have to always make sure that, the hardware, machine instruction set, and compiler in a coordinated way.

ii°) MIS / Machine Instruction set.

iii) Compiler: A "optimising compiler" makes use of various features in the target processor to reduce N x S, which is the total no of clock cycles required to execute a program.

* Elapsed Time: The time (total) taken by the entire system to complete/execute a program. It is affected by the speed of the processor, disk and pointer.

* Processor Time: Its time taken by the processor for the program to be executed / the time during which the processor is active for course of execution of the program.

NOTE: All the above characteristics have been taken in accordance to the equation

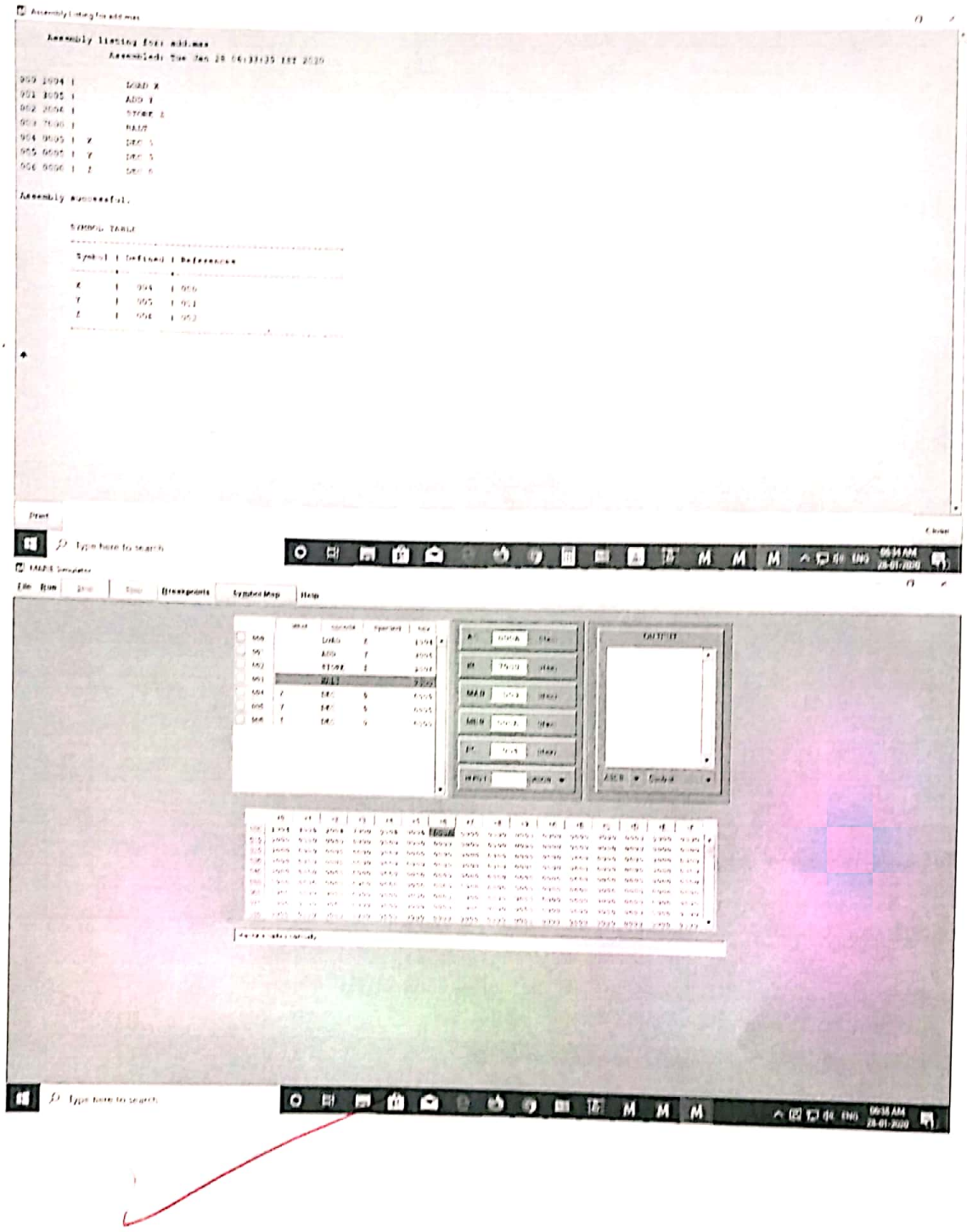
$T = \frac{N \times S}{R}$ - Basic performance eqn of a professor

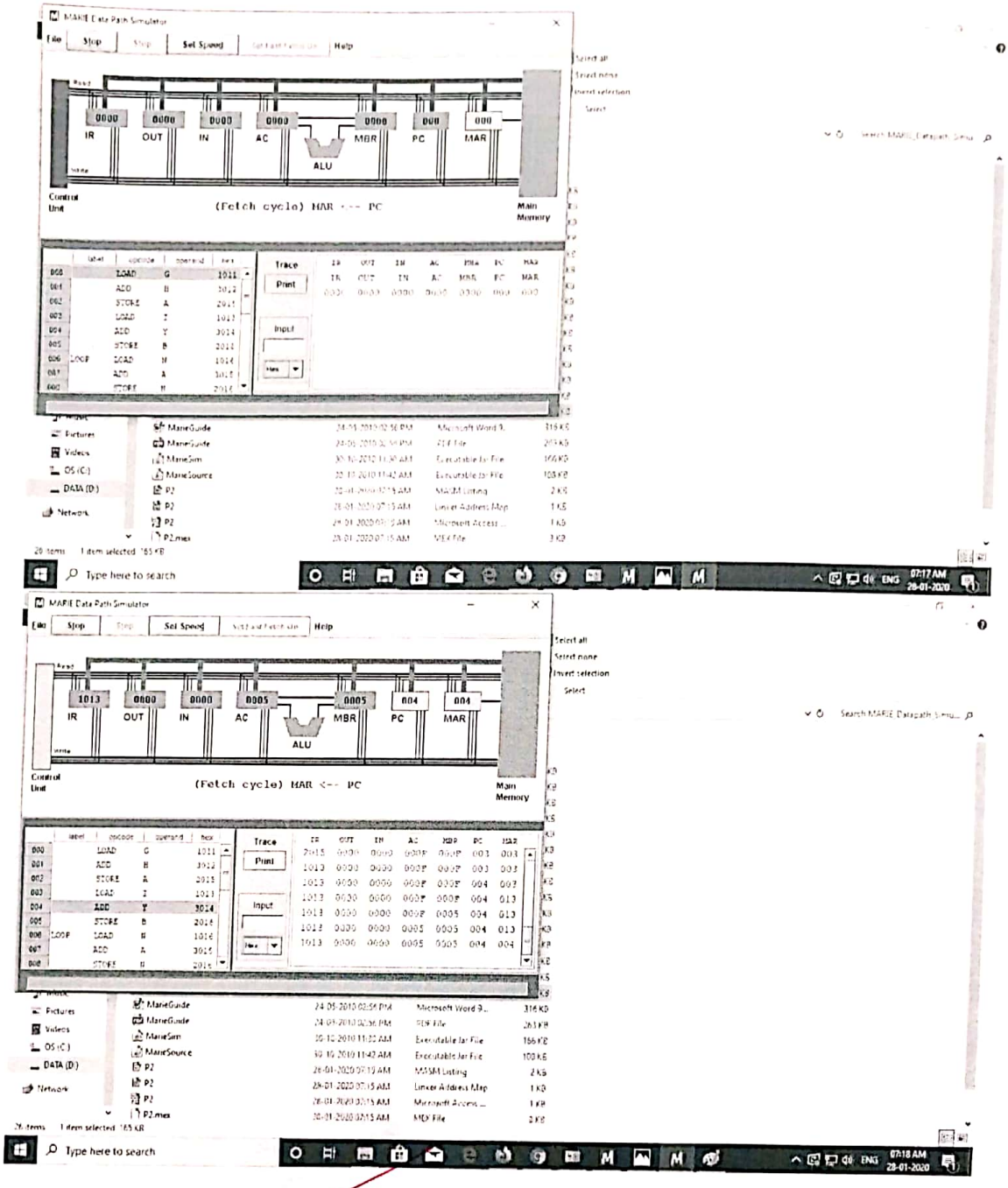
T = Processor time, N = avg no of instructions in a program

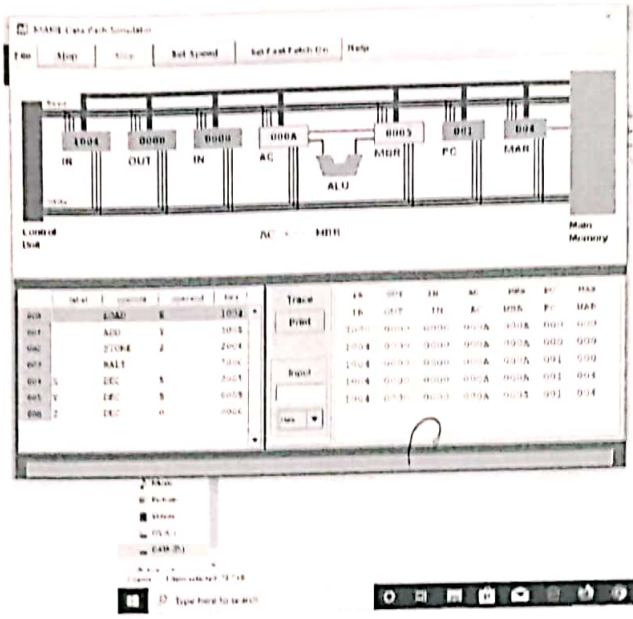
S = avg no of basic steps to complete one machine instruction.

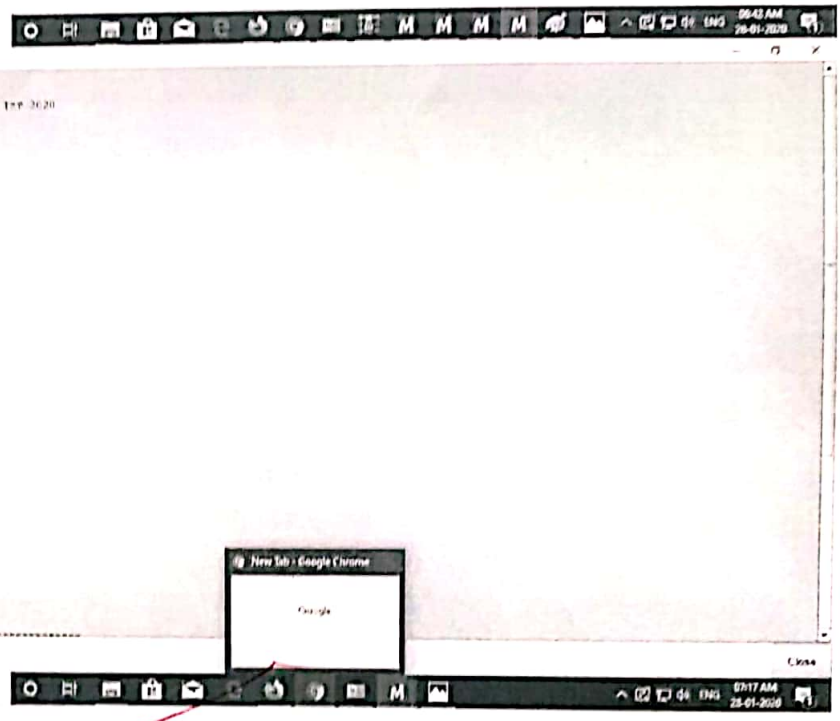
R = Step Rate

Calculated using $R = \frac{1}{P}$, where P is the step length.









Ramaiah Institute of Technology
(Autonomous Institute, Affiliated to VTU)
Department of CSE

Tutorial -III

Programme: B.E
Course: Computer Organization Course Code: CS45

Term: Jan to May 2020

Name: KAUSTUBHA. D. S	**Marks:** /10	**Date:** 04-02-20
USN: 1MS18CS088	**Signature of the Faculty:**	

Objective: To simulate ARM Instruction set using ARMsim simulator.

Simulator Used: ARMSim 1.91 is a desktop application running in a Windows environment. It allows users to simulate the execution of ARM assembly language programs on a system based on the ARM7TDMI processor.

ARM enables the users both to debug ARM assembly programs and to monitor the state of the system while a program executes.

Activity to be performed by students:

1) Write an ARM program to perform basic arithmetic operations.
2) Write an ARM program to demonstrate the working of load and store instructions.
3) Write an ARM program to evaluate expression f=(g+h)-(i+j)
4) Write an ARM program to find the sum of all elements of an array.
5) Write an ARM program to find the factorial of a number.

Programs and the snapshots:

Data Sheet

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Institute of Technology

MARKS :

Name :	KAUSTUBHA · D · S	Branch:	CS
USN/Roll No. :	1MS18CS058	Sem/Sec:	4 - B
Subject :	CO LAB	Subject Code:	CS45

1>
```
MOV R5,#30
MOV R6,#40
ADD R7,R5,R6
SUB R0,R6,R5
MUL R1,R5,R6
SWI 0X11
```

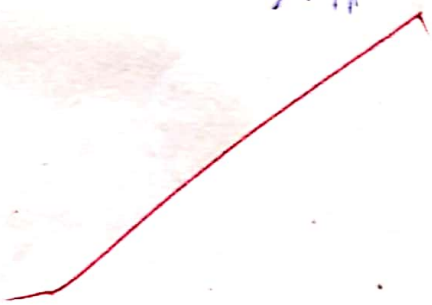
2>
```
MOV R0,#10
MOV R2,#0X00000040
STR R0,[R2,#0]
LDR R3,[R2,#0]
ADD R4,R0,R3
MOV R1,#0X.000000B0
MOV R3,#0
MOV R4,#50
STR R4,[R1,R3]
LDR R6,[R1,R3]
SWI 0X11
```

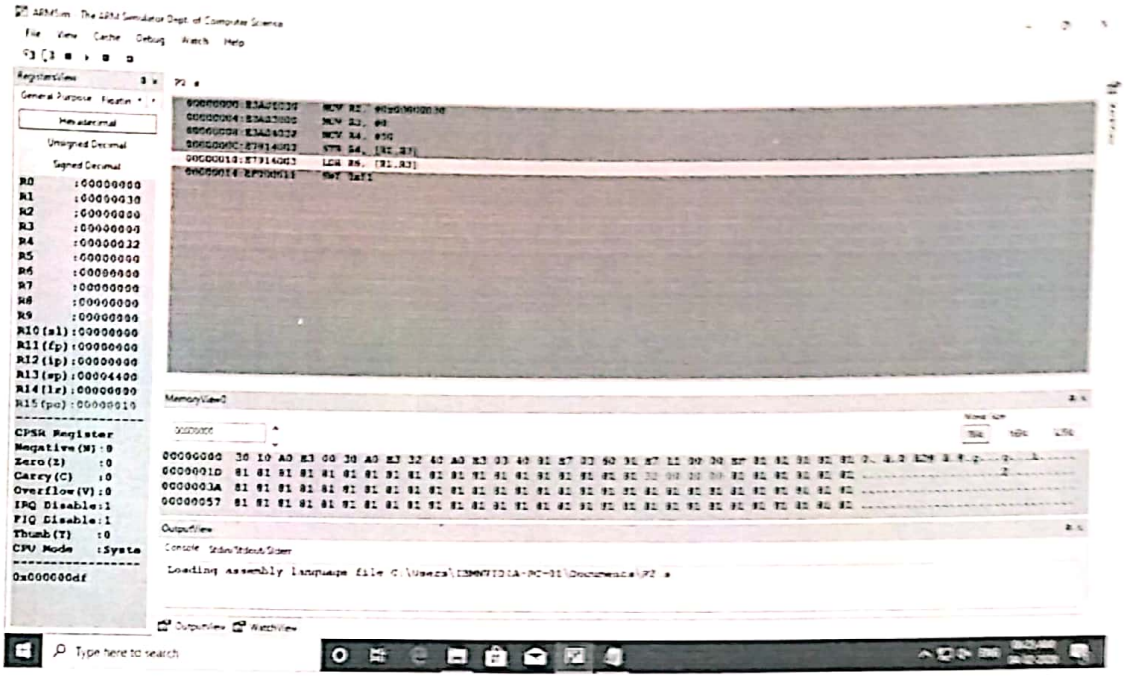
3) MOV R1, #20
MOV R2, #30
ADD R3, R1, R2
MOV R4, #40
MOV R5, #50
ADD R6, R4, R5
SUB R7, R3, R6
SWI 0X11

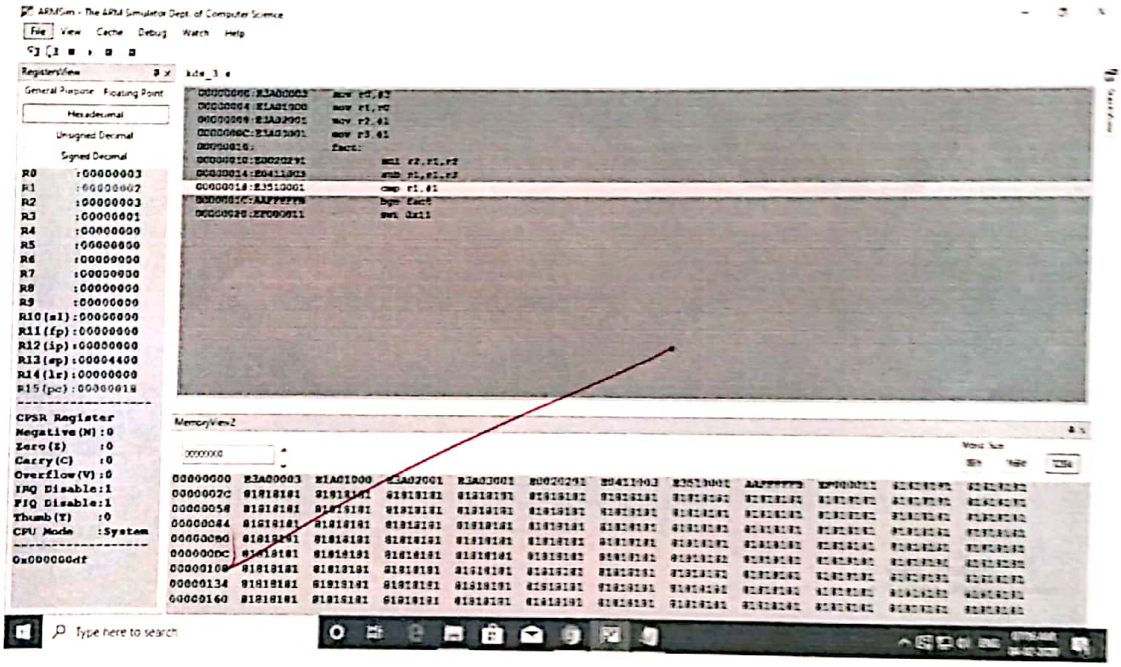
4) LDR R0, =0X20000100
LDR R1, =0X20000500
MOVS R2, #0
MOVS R4, #0
sum
LDRB R3, [R0, R2]
ADDS R4, R4, R3
ADDS R2, R2, #1
CMP R2, #10
BLT sum
STR R4, [R1, #0]
SWI 0X11

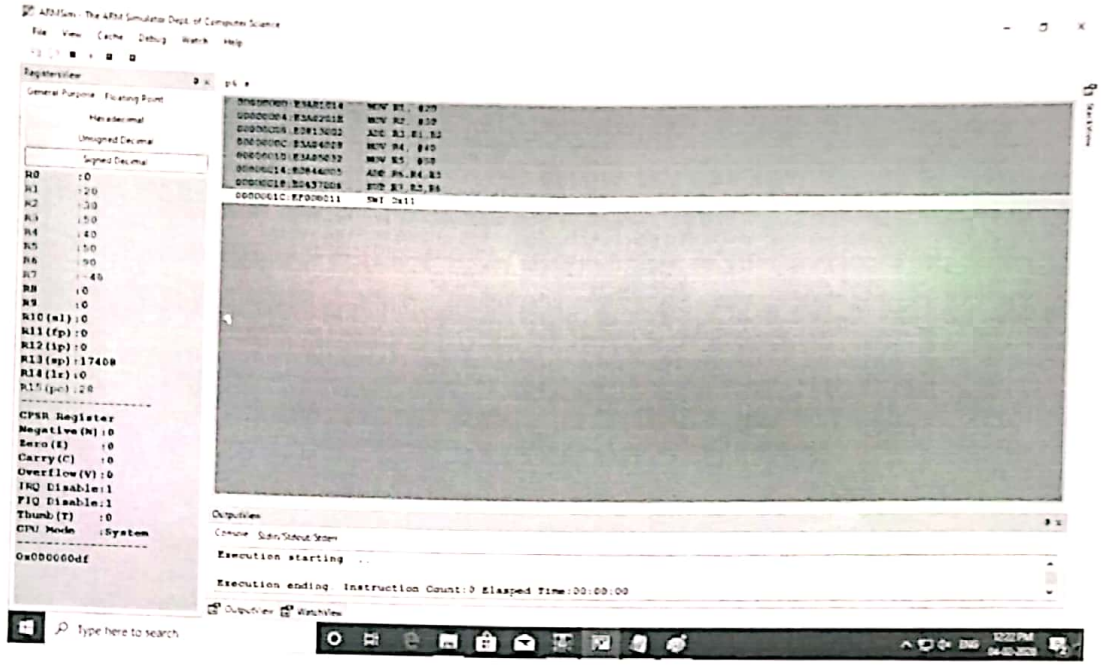
5)

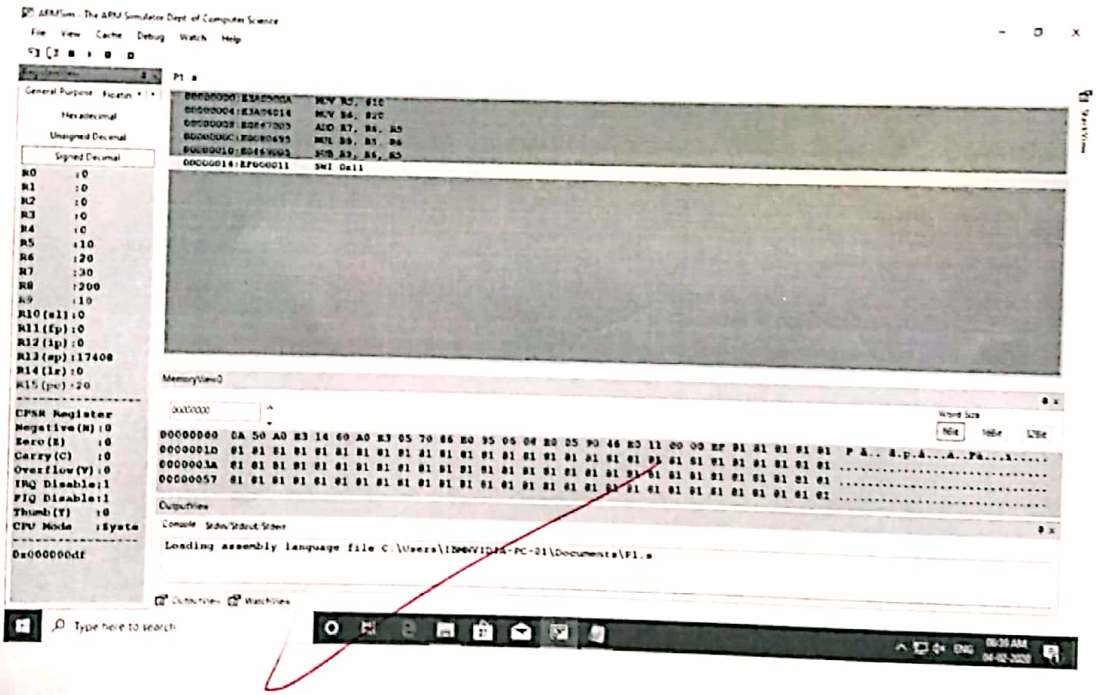
```
mov r0, #3
mov r1, r0
mov r2, #1
mov r3, #1
fact:
    mul r2, r1, r2
    sub r1, r1, r3
    cmp r1, #1
    bge fact
    swi 0x11
```











Ramaiah Institute of Technology
(Autonomous Institute, Affiliated to VTU)

Department of CSE

Programme: B.E | **Term: Jan to May 2019**
Course: Computer Organization | **Course Code: CS45**

Activity IV: Executing ARM programs using ARMsim simulator.

Name:	KAUSTUBHA.D.S	**Marks:** /10	**Date:** 11-02-20
USN:	1MS18CS058	**Signature of the Faculty:**	

Objective: To simulate ARM Instruction set using ARMsim simulator.

Simulator Used: ARMSim 1.91 is a desktop application running in a Windows environment. It allows users to simulate the execution of ARM assembly language programs on a system based on the ARM7TDMI processor.

ARM enables the users both to debug ARM assembly programs and to monitor the state of the system while a program executes.

Activity to be performed by students:

1) Write an ARM program to generate Fibonacci Series.
2) Write an ARM to search an element in an array and print Y if found and print N if not found.
3) Write an ARM program to find the length of a string and copying one string to another.

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Institute of Technology

Data Sheet

MARKS :

Name :	KAUSTUBHA · D · S	Branch:	CSE
USN/Roll No. :	1MS18CS058	Sem/Sec:	4-B
Subject :	COA LAB	Subject Code:	

1)

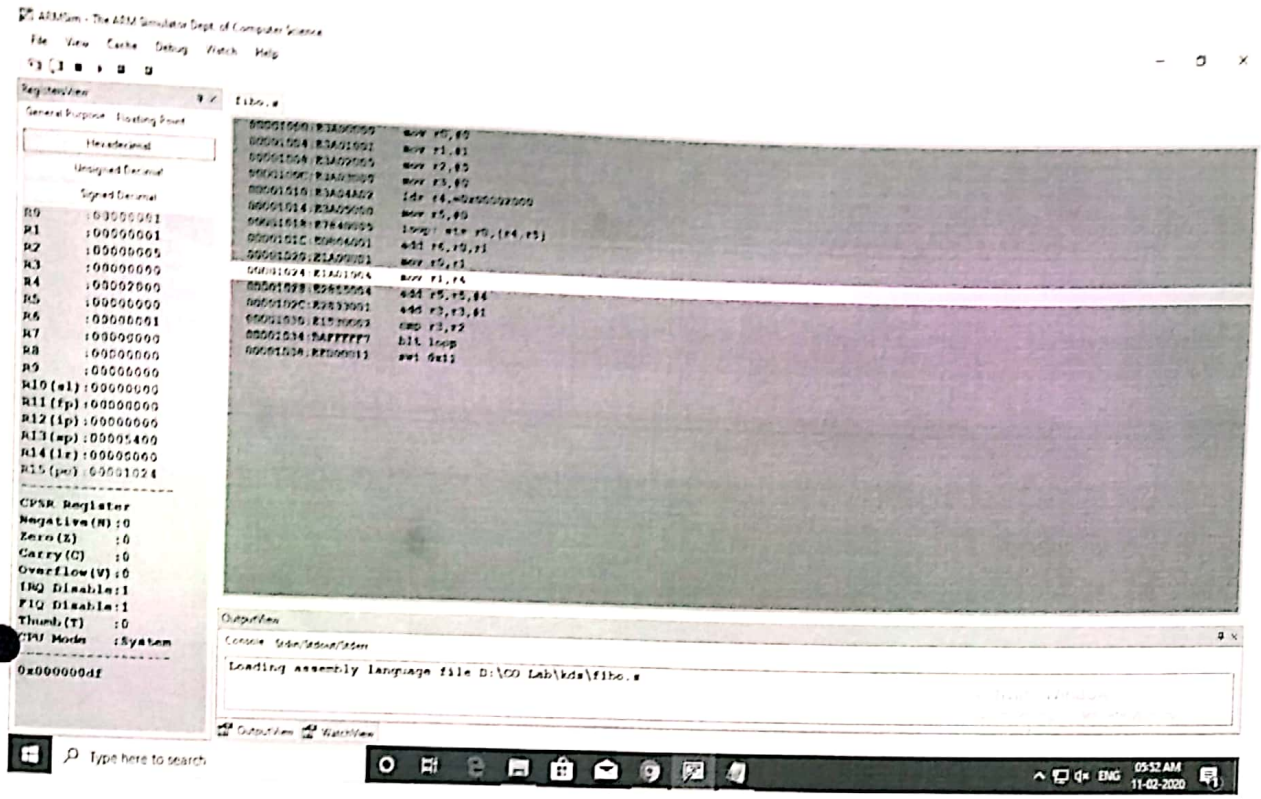
```
mov r0,#0
mov r1,#1
mov r2,#5
mov r3,#0
ldr r4,=0x00002000
mov r5,#0
loop: str r0,[r4,r5]
add r6,r0,r1
mov r0,r1
mov r1,r6
add r5,r5,#4
add r3,r3,#1
cmp r3,r2
blt loop
Swi 0x11
```

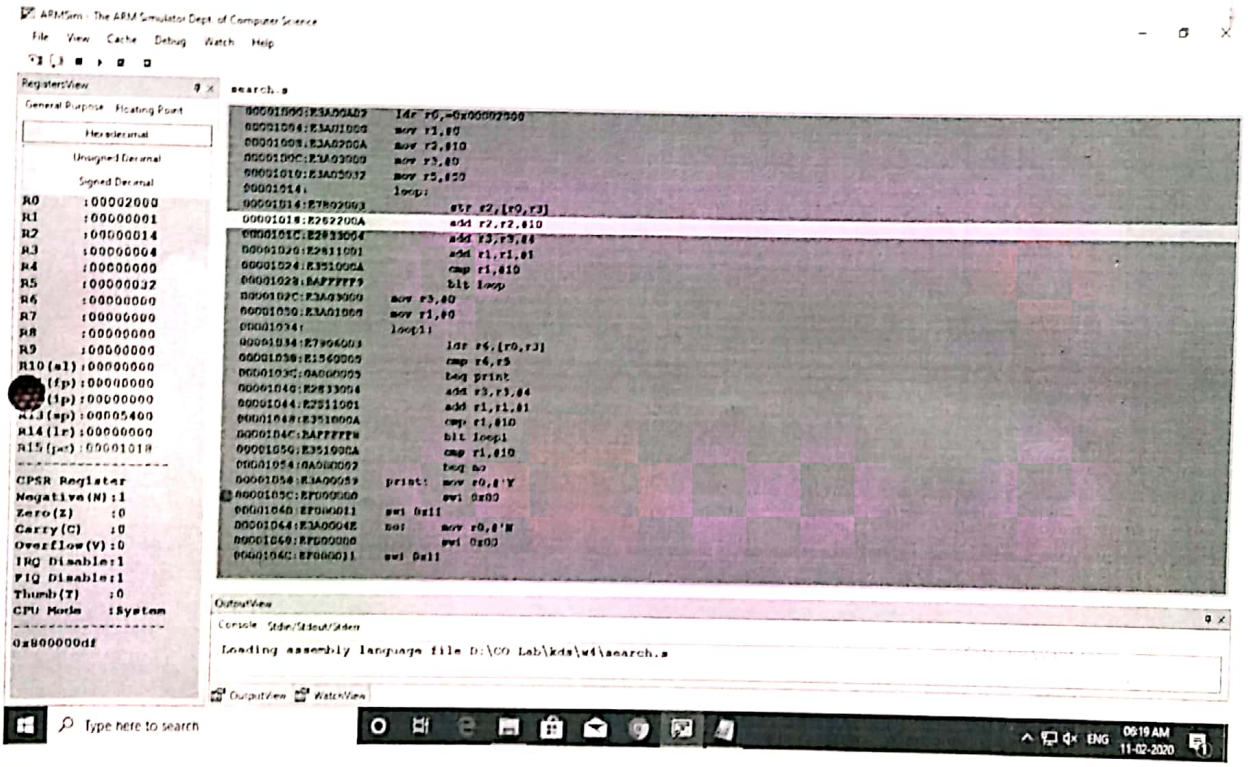
2>
```
ldr r0,=0X00002000
mov r1,#0
mov r2,#10
mov r3,#0
mov r5,#50
loop:
        str r2,[r0,r3]
        add r2,r2,#10
        add r3,r3,#4
        add r1,r1,#1
        cmp r1,#10
        blt loop
mov r3,#0
mov r1,#0
loop1:
        ldr r6,[r0,r3]
        cmp r6,r5
        beq print
        add r3,r3,#4
        add r1,r1,#1
        cmp r1,#10
        beq no
print: mov r0,#'y
        swi 0X00
swi 0X11
no: mov r0,#'N
```

```
        swi 0x00
swi 0x11
```

3)

```
ldr r0, =0x00002000
ldr r1, =0x0000202C
sub sp, sp, #4
str r4, [sp, #0]
mov r4, #0
l1: add r2, r4, r1
    ldrb r3, [r2, #0]
    add r12, r4, r0
    strb r3, [r12, #0]
    beq l2
    add r4, r4, #1
    bl l1
l2: ldr r4, [sp, #0]
    add sp, sp, #4
    mov pc, lr
swi 0x11
```





CO-LAB 5

Kaustubha D.S
1MS18CS058
4-'B'

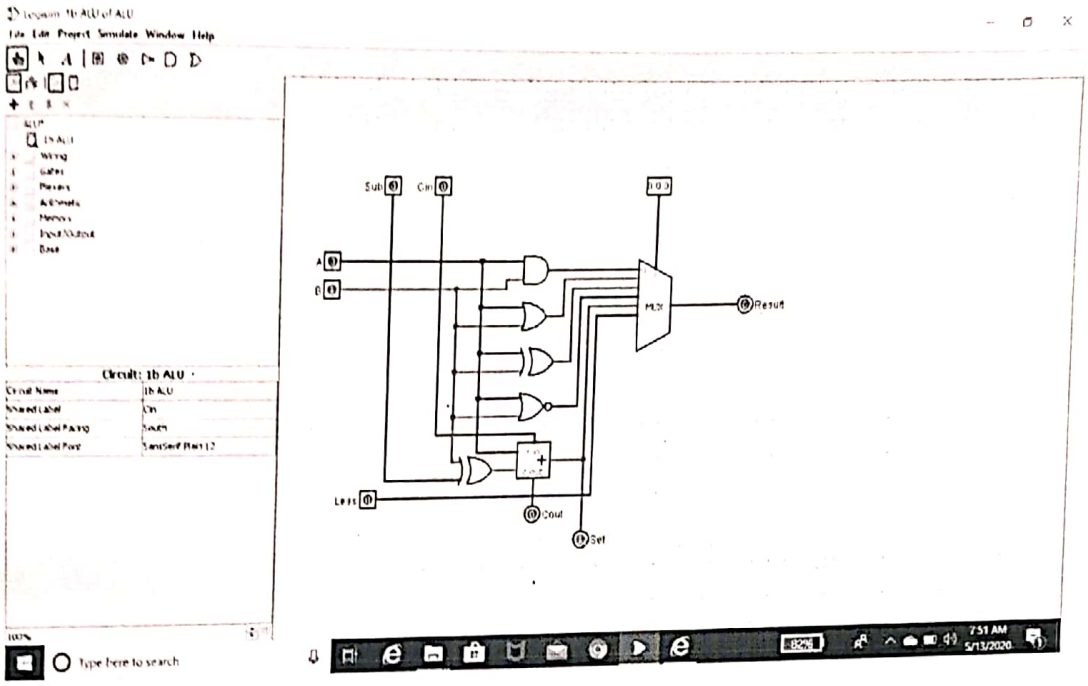
Activity-5: Designing an ALU to perform arithmetic and logical functions using logisim simulator.

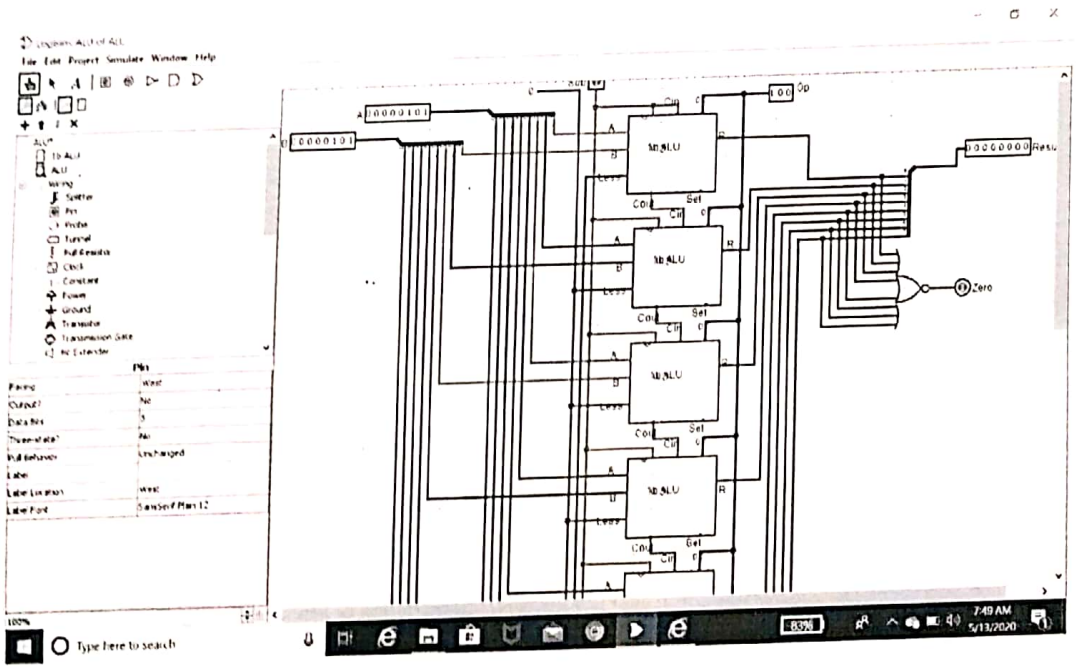
Objective: To simulate working of ALU using simulator.

Activity to be performed by students:

List out the steps in designing the ALU:

1) Add the two i/p pins Name them A & B.
2) Add OR, AND, NOR, XOR gates and a 1 bit adder.
3) Connect the A's and B's of all the gates to their respective pins.
4) Add an output pin and name it Result.
5) Add a 1 bit multiplier and 3 select bits.
6) Connect outputs of all gates to the mux.
7) Connect 3 bit i/p him to Mux
8) Add i/p pin to Cin and o/p pin to Cout.
9) Add an XOR gate, connect its op to Cout. The first i/p must be connected to B and second to another i/p pin sub.
10) Add another i/p and name it less. Connect it to the mux.
11) Add an output pin and name it, connect it to the o/p of the adder unit.





CO LAB - 6

Kaustubha. D.S
1MS18CS052
4 - 'B'

Activity 6: To stimulate writing operation on memory and hence to design a memory system using logisim simulator.

Objective: To simulate writing operation on memory.

Activity to be performed by students:

List out the steps in designing memory system:

1) Add a RAM with seperate load and store selected for the component.
2) Add a counter and connect it to the RAM.
3) Connect a clock to a controlled buffer and connect its o/p to the RAM.
4) Add a clock and connected to this i/p of the buffer.
5) Add a TTY unit with 32 rows and columns, make a connection with the RAM.
6) Add a 7 bit random number generator, connected Q to D of RAM.
7) Add another controlled buffer, connect it to TTY. Also add an i/p pin to the buffer.
8) Connect o/p of the second buffer to the counter.
9) Connect a button to the counter.