DEPARTMENT OF INFORMATION TECHNOLOGY::VRSEC

REPORT ON INNOVATIVE DELIVERY METHOD

20IT3304 – COMPUTER ORGANIZATION

A.Y. 2023-24
FLIPPED CLASS ROOM

Name of the Topic: Computer Arithmetic Algorithms

Target Audience: Students of II/IV B.Tech I Semester

Date of activity conducted: 21-11-2023 (Section C)

No. of students participated : 70

Name of the Faculty : Dr.K.SitaKumari, Associate Professor,
Mrs.G.Geetha, Asst Professor

Objective of the activity:

- Task is mapped to course outcome 3 at K3(apply level) and this task can be used to improve the attainment of CO3.
- Understand the concepts of various Arithmetic operations.
- Identify the hardware required for implementing various arithmetic operations.
- Apply the algorithms for the given problem statement for performing operations on signed magnitude data and signed 2's complement data.

Resources provided to the students before conducting the activity:

- Learning Material
- PPT
- Video Lecture links

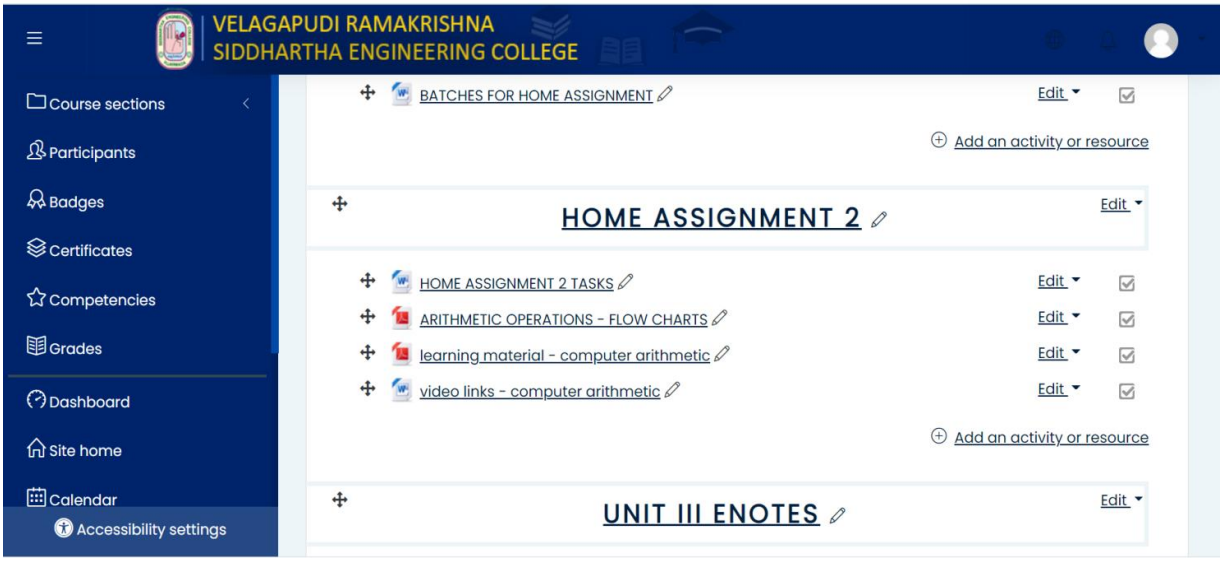


Figure1: Snapshot of resources provided through Moodle

Introduction:

Good Teaching is one of the most important tasks of the faculty. Students are needed to get understand the concepts clearly and provide solutions to the problems. Flipped classroom is one way to ensure that class time is spent in assimilation, rather than in information transmission.

- Instructor finds or creates videos on topic.
- Students watch video before coming to class.
- Class time is spent in activities and discussions.

The students can understand the topic through the resources provided and get more clarity with the discussions and activity done in groups.

As a part of activity, students are divided into groups of their own with minimum batch size of 4 and task on implementing computer arithmetic algorithms is given for each group and students are asked to discuss among themselves and solve the problem. One representative from each group is asked to demonstrate the solution for the task given to them.

Execution Plan:

Time management: Class time: **50mins**

- Formation of Groups : 5 mins
- Dissemination of problem statements : 5 mins
- Discussion on computer arithmetic algorithm given within the group : 10 mins
- Problem solving : 15 mins
- Demonstration by the students : 10 mins
- Course coordinator summary : 5mins

Expected Outcomes:

The students can be able to

- Understand the concepts and hardware required for performing arithmetic operations.
- Apply various Arithmetic algorithms for the given problem statement
- Analyze the hardware required for performing algorithms for various types of data.
- Improve team work and communication skills.

Assessment of the effectiveness of the activity by comparing marks of Assignment II with Sessional II:

Snapshot of task done and the photos of the activity:

DEPARTMENT OF INFORMATION TECHNOLOGY : : VRSEC

II/IV B.TECH I SEMESTER I SECTION A & C

A.Y: 2023-2024

Dt: 21-11-23

Student Learning activity

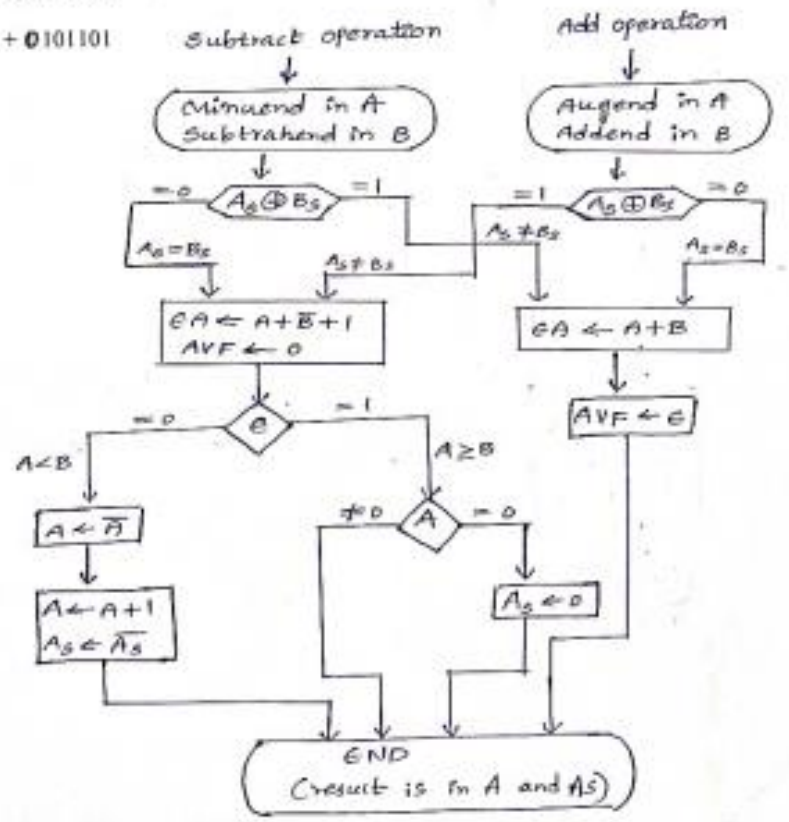
Topic : Computer Arithmetic –Addition, Subtraction, Multiplication and division algorithms

1. Draw the flowchart for addition algorithm when data is represented in signed ~~2's complement~~ magnitude representation and mark each individual path in the flowchart by a number and then indicate the overall path that the algorithm takes when the following signed magnitude numbers are computed. In each case give the value of AVF. The left most bit in the following numbers represents the sign bit.

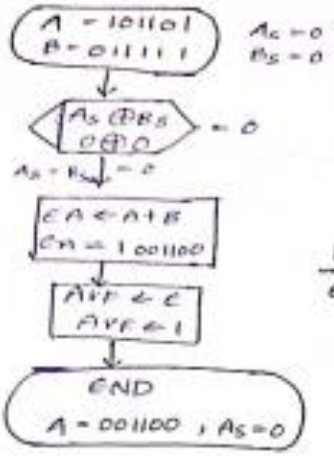
a. 0 101101 + 0 011111

b. 1 011111 + 0 101101

Flowchart for add and subtract operation



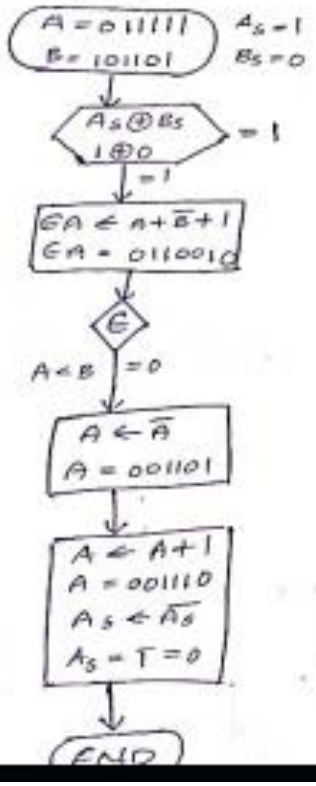
a) 0 101101 + 0 011111



1 1 1 1
1 0 1 1 0 1
0 1 1 1 1 1
0 0 1 1 0 0

1 = E
0 0 1 1 0 0 = A

b) 1 011111 + 0 101101



$\overline{B}$ = 010010

$\overline{B}$ + 1 = 010011

0 1 0 0 1 0
+ 1
0 1 0 0 1 1

A + $\overline{B}$ + 1

1 1 1 1 1
0 1 1 1 1 1
+ 0 1 0 0 1 1
1 1 0 0 1 0

0 = E
1 1 0 0 1 0 = A

0 0 1 1 0 1
+ 1
0 0 1 1 1 0

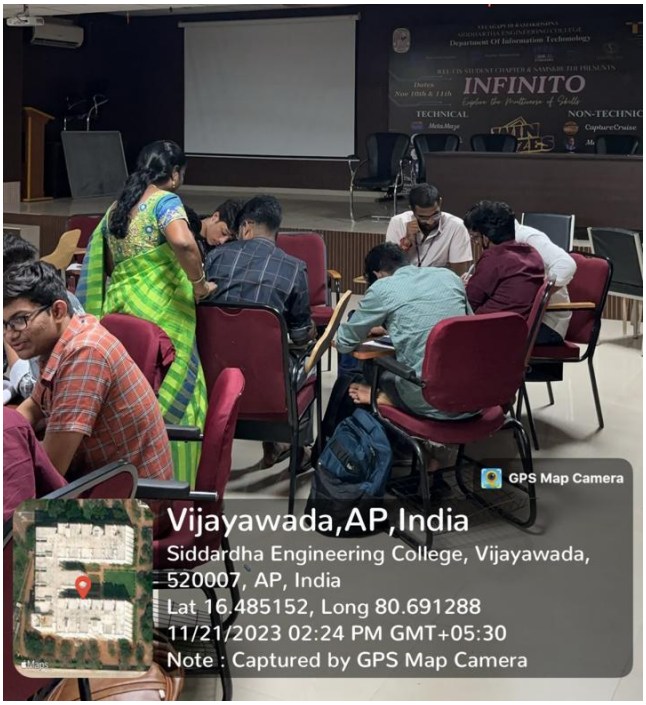
2. Show the contents of registers E, A, Q and SC during the process of multiplication of two binary numbers, 1011 (multiplicand) and 1001 (multiplier). The signs are not included.

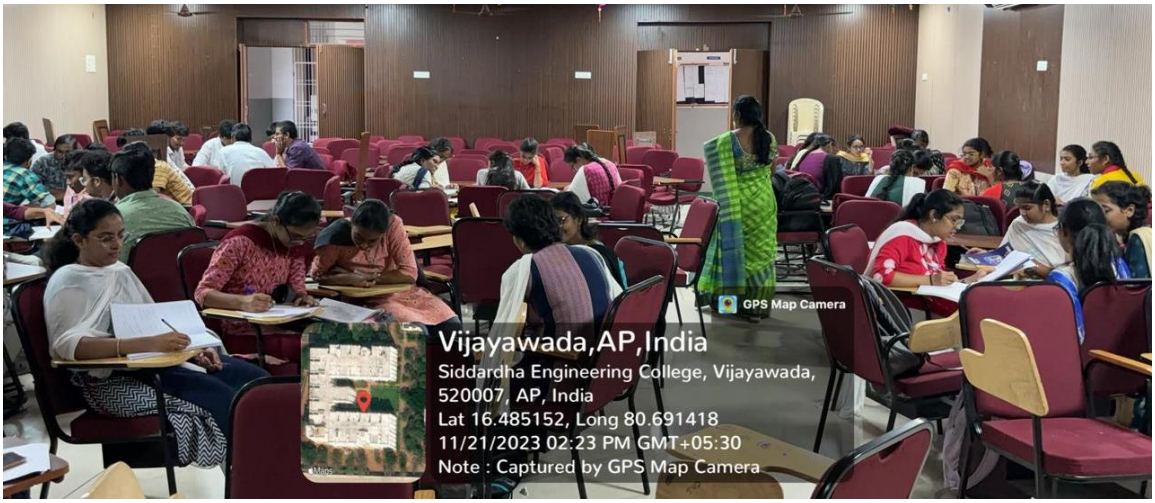
Multiplicand B = 1011	E	A	Q	SC
Multiplier in Q	0	00000	10011	101
$Q_n = 1$; add B		10111		
First partial product	0	10111		
shift right EAQ	0	01011	11001	100
$Q_n = 1$; add B		10111		
Second partial product	1	00010		
shift right EAQ	0	10001	01100	011
$Q_n = 0$; shift right EAQ	0	01000	10110	010
$Q_n = 0$; shift right EAQ	0	00100	01011	001
$Q_n = 1$; add B		10111		
Fifth partial product	0	11011		
shift right EAQ	0	01101	10101	000

Final product in AQ = 01101 10101

Team Members:

1. 22BW1A12D4 B. Nagalakshmi
2. 22BW1A12D8 B. Vasavi
3. 22BW1A12F7 K. Tanuja
4. 22BW1A12G5 Aashritha
5. 22BW1A12H3 M Navya
6. 23BW5A1221 Pavani





Students working in teams to find the solution for given task

Assessment of the effectiveness of the activity

Register No	Assessment before activity Sessional I marks	Assessment after activity Sessional II marks	Impact (Place a tick and state the % of impact)			
			Negative change	No change	Improvement	%
228W1A12D1	8	14.5			✓	
228W1A12D2	0	9			✓	
228W1A12D3	8	11.5			✓	
228W1A12D4	10.5	15			✓	
228W1A12D5	4	8			✓	
228W1A12D7	8.5	15			✓	
228W1A12D8	6.5	13.5			✓	
228W1A12D9	5	14			✓	
228W1A12E0	7	10.5			✓	
228W1A12E1	11	14.5			✓	
228W1A12E2	8.5	12.5			✓	
228W1A12E3	8	10.5			✓	
228W1A12E4	8	15			✓	
228W1A12E5	6	15			✓	
228W1A12E6	8.5	12			✓	
228W1A12E7	9	10.5			✓	
228W1A12E8	6.5	10			✓	
228W1A12E9	7	11.5			✓	
228W1A12F0	9.5	11.5			✓	
228W1A12F1	7	11.5			✓	
228W1A12F2	6	9			✓	
228W1A12F3	1.5	12.5			✓	
228W1A12F4	8	11			✓	
228W1A12F5	9	13.5			✓	
228W1A12F6	8.5	7	✓			
228W1A12F7	6	11.5			✓	
228W1A12F8	10	12.5			✓	
228W1A12F9	11	15			✓	
228W1A12G0	9	14.5			✓	
228W1A12G1	6.5	12			✓	
228W1A12G2	5.5	13.5			✓	
228W1A12G3	7.5	14			✓	
228W1A12G4	1	8			✓	
228W1A12G5	8.5	13			✓	
228W1A12G6	10	14			✓	
228W1A12G7	5.5	12.5			✓	
228W1A12G8	9.5	13			✓	

228W1A12G9	8	9.5			✓	
228W1A12H0	10.5	14.5			✓	
228W1A12H1	9	11.5			✓	
228W1A12H2	10	15			✓	
228W1A12H3	14	13.5	✓			
228W1A12H4	12.5	14			✓	
228W1A12H5	3.5	9			✓	
228W1A12H6	8.5	11			✓	
228W1A12H7	7	12.5			✓	
228W1A12H8	9	15			✓	
228W1A12H9	10.5	12.5			✓	
228W1A12I0	11.5	12.5			✓	
228W1A12I1	14	15			✓	
228W1A12I2	9.5	14.5			✓	
228W1A12I3	8.5	14			✓	
228W1A12I4	6.5	13.5			✓	
228W1A12I5	12	15			✓	
228W1A12I6	11.5	15			✓	
228W1A12I7	10	15			✓	
228W1A12I8	8	12			✓	
228W1A12I9	10.5	10.5			✓	
228W1A12J0	9	7	✓			
228W1A12J1	9	10			✓	
228W1A12J2	10.5	8	✓			
228W1A12J3	10.5	10.5			✓	
228W1A12J4	13	15			✓	
238W5A1216	8	10.5			✓	
238W5A1217	11	13.5			✓	
238W5A1218	14	15			✓	
238W5A1219	10.5	13.5			✓	
238W5A1220	13	15			✓	
238W5A1221	10	11.5			✓	
238W5A1222	11	12			✓	

No of students involved in activity	No of students with Negative change	No of students without change	No of students with Improvement	Impact (%)
70	**04**	**00**	**66**	**94.3%**

Students Performance	No of Students	Percentage
Improvement	66	94.3%
No Change	00	0%
Negative Change	04	5.7%