UCS1512 – Microprocessors Lab

Case Conversion

Exp no : 1 2 Name: Sreedhar V

Date : 02-11-2020 Reg no: 185001161

AIM:

To program and execute the program for 8-bit arithmetic operations using 8051 microcontroller using EDSim.

8-bit addition:

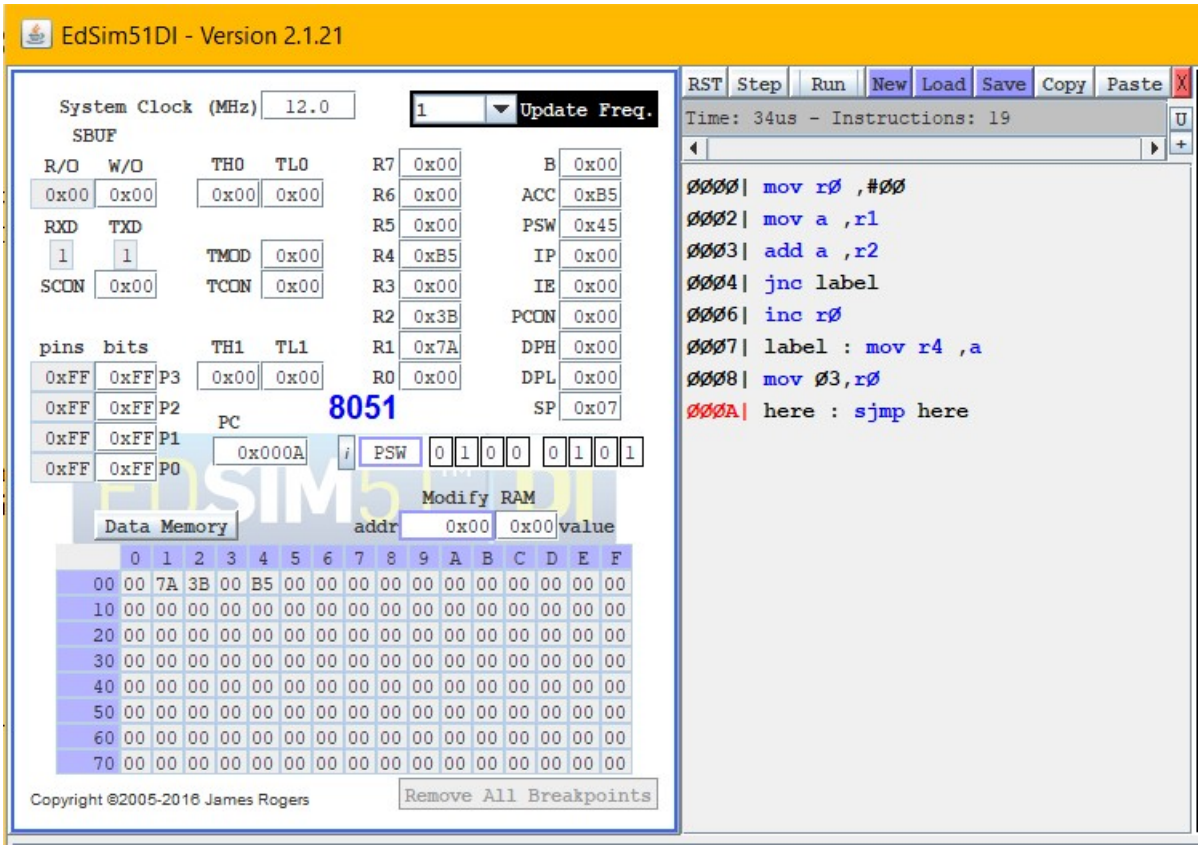
Algorithm:

- Move the input1 to A.
- Move 00h to R0 to make store the carry.
- Add the input2 to A and store the result in A.
- Jump if no carry to label.
- Increment R0 to make carry.
- Label: move the result to register 4 and carry to register 3.
- Terminate the program.

Program:

CODE	COMMENT
Program for 8-bit Addition: mov r0 ,#00 mov a ,r1 add a ,r2 jnc label inc r0 label : mov r4 ,a mov 03,r0 here : sjmp here	 Move value 00 to R0 Move value1 to R1 Add R2 and the value stored in A Jump to label if no carry is generated Increment R0 for carry Move the result to R4 Move the carry to R3 Terminate the program

Snapshot of sample input and output:



8-bit subtraction:

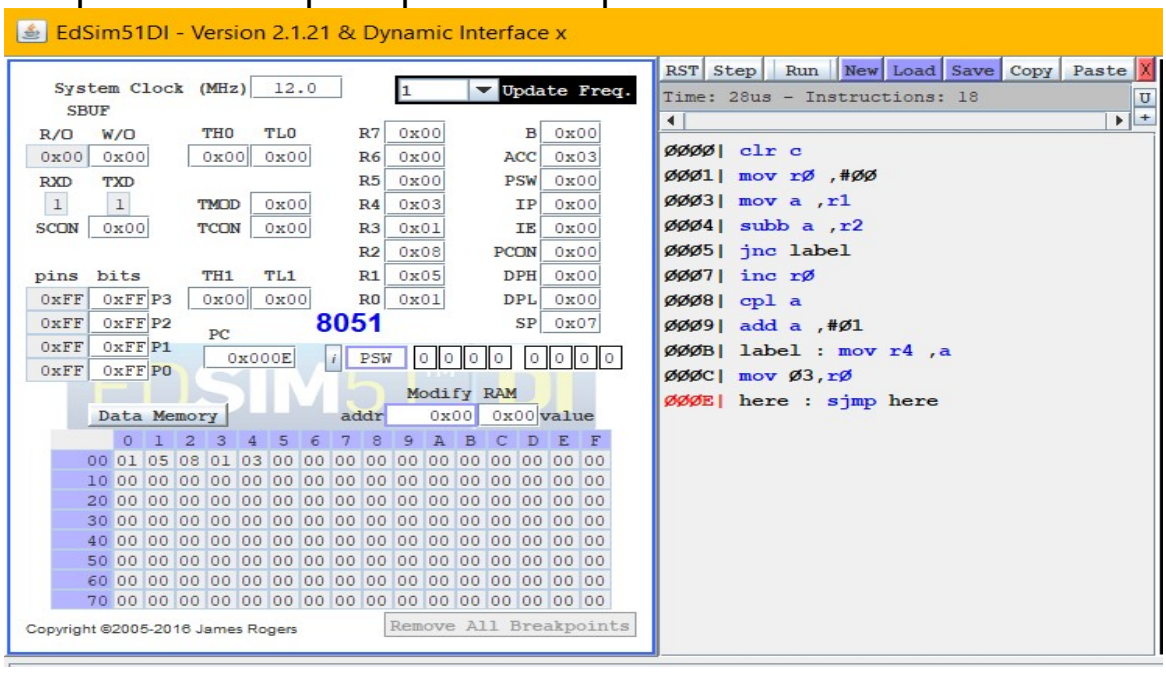
Algorithm:

- Move input1 to A.
- Move 00h to R0 to make store the carry
- Move the Subtract the second input from A and store the result in A.
- Jump if no carry to label.
- Increment R0 to make carry.
- Complement A if there is a carry
- Label: move the result to register 4 and carry to register 3.
- Terminate the program.

Program:

CODE	COMMENT
Program for 8-bit Subtraction: clr c mov r0 ,#00 mov a ,r1 subb a ,r2 jnc label inc r0 cpl a add a ,#01 label : mov r4 ,a mov 03,r0 here : sjmp here	 Clearing the carry flag Move value 00 to R0 Move value1 to R1 Subtract R2 from the value stored in A Jump to label if no carry is generated Increment R0 for carry Complement A Add 01 to A // To get 2's Complement Move the result to R4 Move the carry to R3 Terminate the program

Snapshot of sample input and output:



8-bit multiplication:

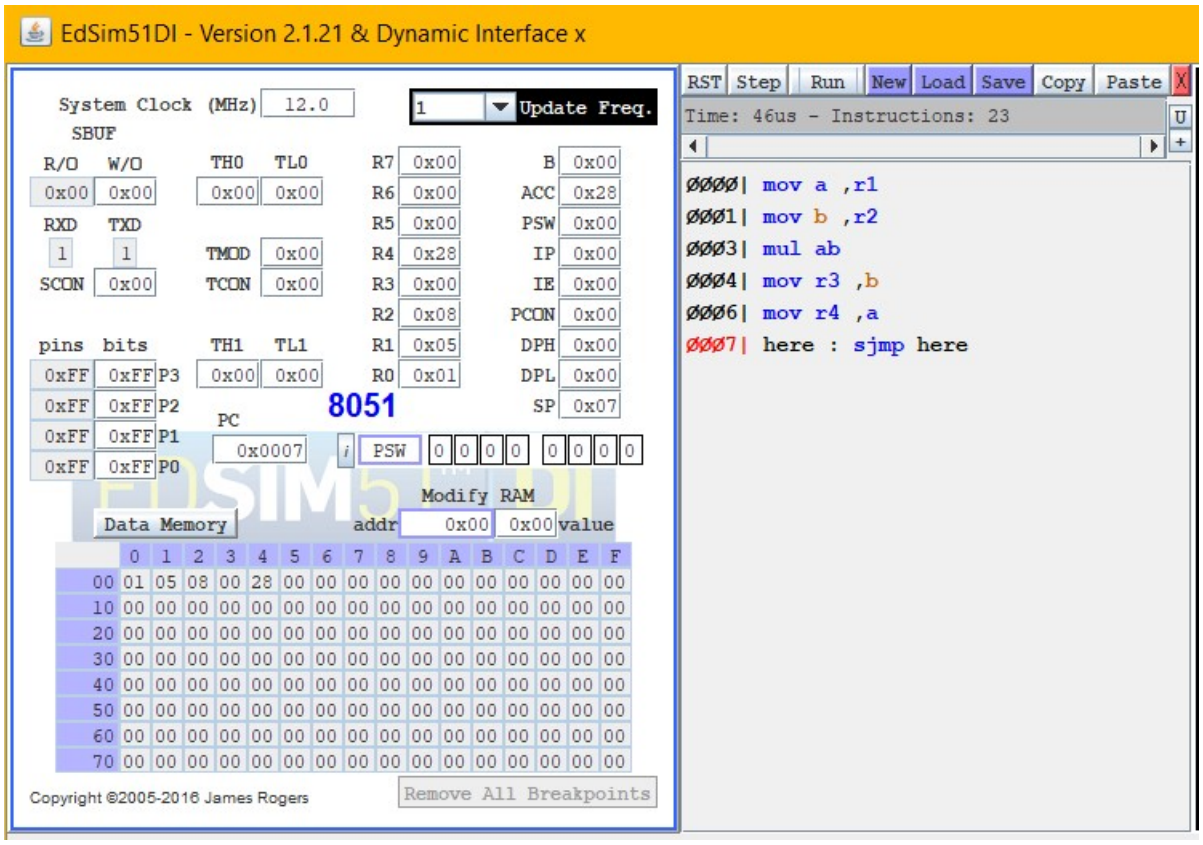
Algorithm:

- Move the input1 to A.
- Move the input2 to B .
- Multiply A and B.(produces 16-bit output ,stored in BA)
- Move the higher order byte from B to R3.
- Move the lower order byte from A to R4.
- Terminate the program

Program:

CODE	COMMENT
Program for 8-bit Multiplication: mov a ,r1 mov b ,r2 mul ab mov r3 ,b mov r4 ,a here : sjmp here	 Move the input 1 from R1 to A Move the input 2 from R2 to B Multiply A and B using MUL Move the higher order byte from B to R3 Move the lower order byte from A to R4 Terminate the program.

Snapshot of sample input and output:



8-bit Division:

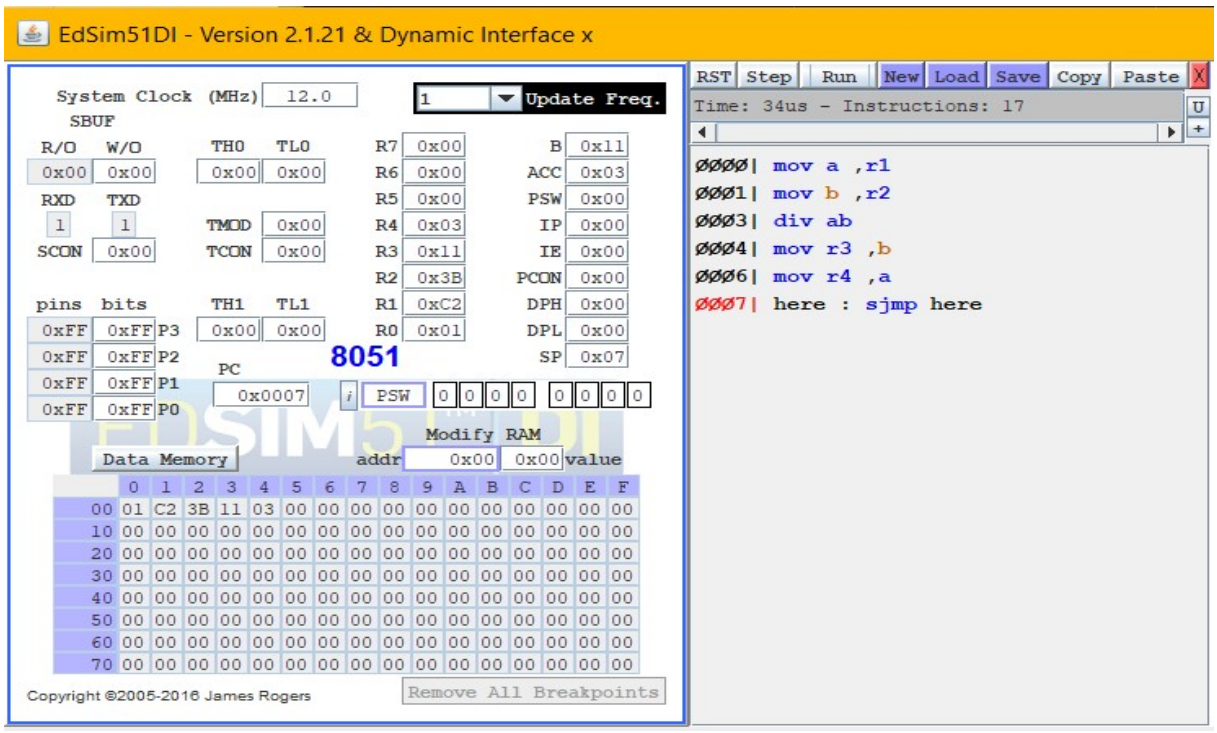
Algorithm:

- Move input1 to A.
- Move input2 to B .
- Division A and B.
- Move the remainder from B to R3.
- Move the quotient from A to R4.
- Terminate the program.

Program:

CODE	COMMENT
Program for 8-bit Division: mov a ,r1 mov b ,r2 div ab mov r3 ,a mov r4 ,b here : sjmp here	 Move the input 1 from R1 to A Move the input 2 from R2 to B Divide A and B using DIV Move the remainder from B to R3 Move the quotient from A to R4 Terminate the program.

Snapshot of sample input and output:



Result:

8-bit arithmetic operations is executed and verified using 8051 microcontroller using EDSim.

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Cube of a number

Exp no : 1 3 Name: Sreedhar V

Date : 02-11-2020 Reg no: 185001161

AIM:

To program and execute the program for finding cube of a number using 8051 microcontroller using EDSim.

Cube of a number:

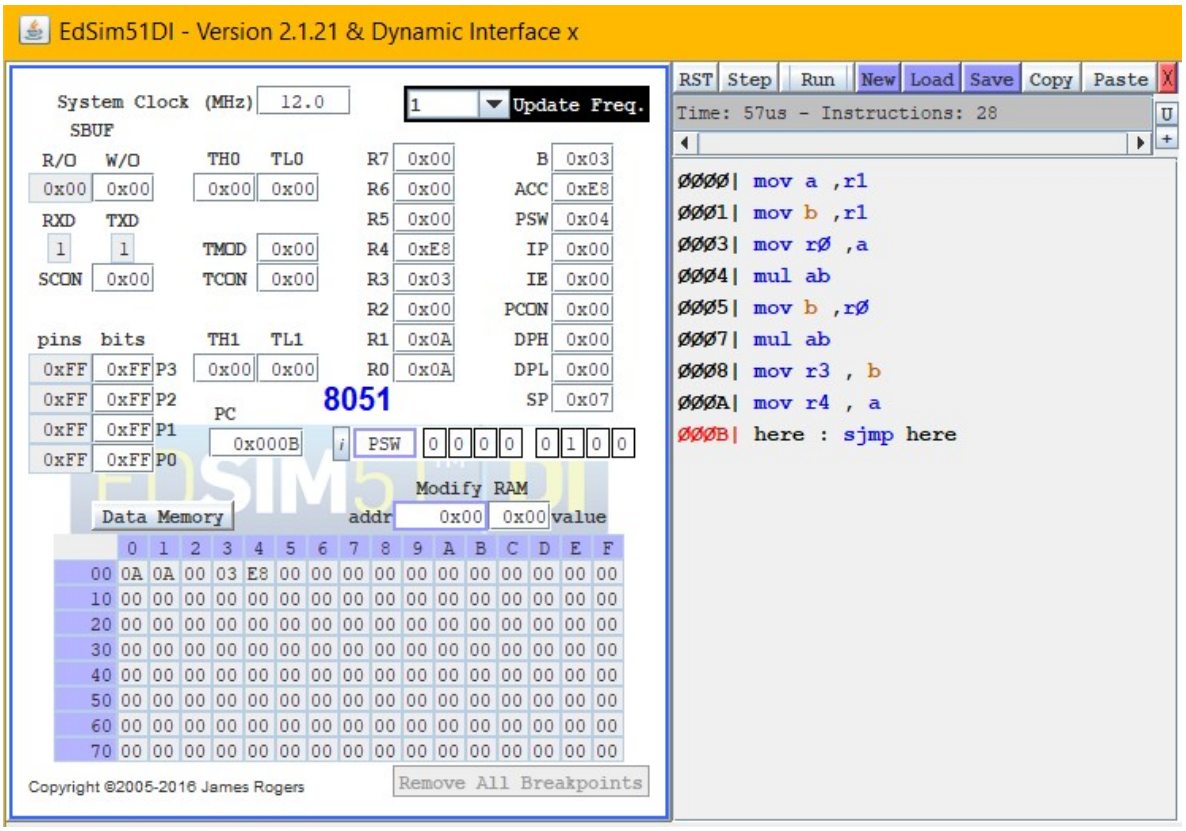
Algorithm:

- Move the input to A.
- Move the input to B.
- Move the input to R0 to save a copy of input.
- Multiply A and B.
- Move the input from R0 to B.
- Multiply A and B.
- Move the higher order byte from B to R3.
- Move the lower order byte from A to R4.
- Terminate the program.

Program:

CODE	COMMENT
Program for Cube of a number: mov a ,r1 mov b ,r1 mov r0 ,a mul ab mov b ,r0 mul ab mov r3 , b mov r4 , a here : sjmp here	 Move the input from R1 to A Move the input from R1 to B Move the input from A to R0. Multiply A and B using MUL Move the input from R0 to B. Multiply A and B using MUL Move the higher order byte from B to R3 Move the lower order byte from A to R4 Terminate the program

Snapshot of sample input and output:



Result:

Cube of a number is executed and verified using 8051 microcontroller using EDSim.

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Conversion of BCD to ASCII

Exp no : 1 4 Name: Sreedhar V

Date : 02-11-2020 Reg no: 185001161

AIM:

To program and execute the program for finding cube of a number using 8051 microcontroller using EDSim.

Cube of a number:

Algorithm:

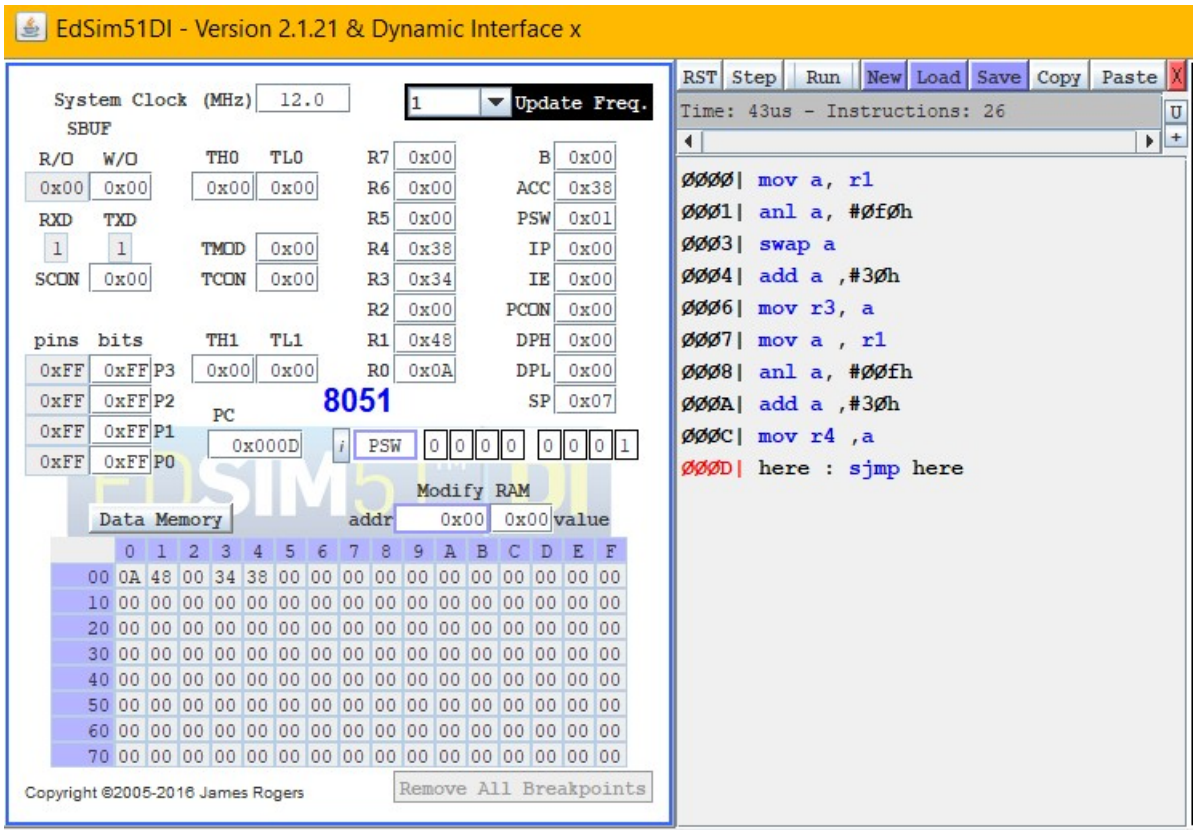
- Move the input to A.
- Get the higher order byte of A by performing logical AND over A and F0h
- Swap A to get the higher order byte.
- Add A with 30h to get the ASCII value
- Move the output in A to R3.
- Move the input to A.
- Get the lower order byte of A by performing logical AND over A and 0Fh.
- Add A with 30h to get the ASCII value
- Move the output in A to R4.
- Terminate the program.

Program:

CODE	COMMENT

Program for Cube of a number:
 	
mov a, r1
anl a, #0f0h
swap a
add a ,#30h
mov r3, a
mov a , r1
anl a, #00fh
add a ,#30h
mov r4 ,a
here : sjmp here
	
	Move the input from R1 to A
	AND A with 0Fh to mask the lower order byte
	Swap A to get the higher order byte.
	Add A with 30h to get the ASCII value
	Move A to R3
	Move the input from R1 to A
	AND A with F0h to mask the higher order byte
	Add A with 30h to get the ASCII value
	Move A to R4
	Terminate the program

Snapshot of sample input and output:



Result:

Convertion of BCD to ASCII is executed and verified using 8051 microcontroller using EDSim