

Assembly Project

Calculate the difference
between two numbers

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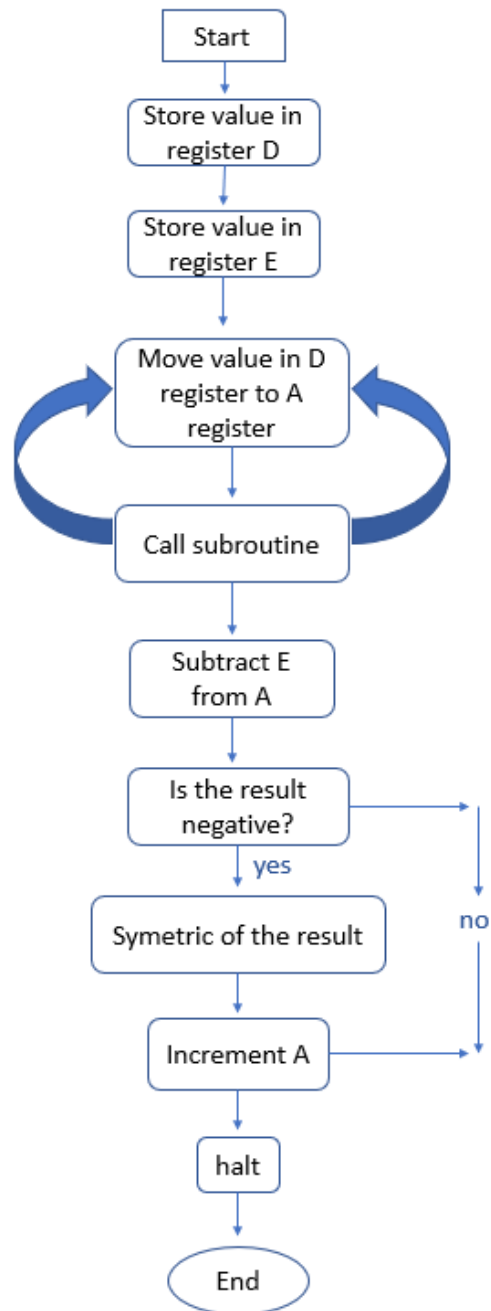
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Objective

The objective of this project is to learn, understand the Assembly 8085 language, and to improve our programming skills combined with the Computers Architecture course.

Our project consists of writing a routine that will calculate the difference between two bytes. These bytes will be passed through registers D and E and the difference is returned in register A. The result is the module of the difference between both, that is, the difference between the numbers is positive.

Fluxogram



Memory Map

*	Address	Label	Mnemonics	Hexcode	Bytes	M-Cycles	T-States
✓	0000		MVI D,02	16	2	2	7
	0001			02			
✓	0002		MVI E,09	1E	2	2	7
	0003			09			
✓	0004		CALL OPER...	CD	3	5	18
	0005			08			
	0006			00			
✓	0007		HLT	76	1	2	5
✓	0008	OPER...	MOV A,D	7A	1	1	4
✓	0009		SUB E	93	1	1	4
✓	000A		JNC SKIP	D2	3	3	10
	000B			0F			
	000C			00			
✓	000D		CMA	2F	1	1	4
✓	000E		INR A	3C	1	1	4
✓	000F	SKIP	RET	C9	1	3	10
✓	0010		HLT	76	1	2	5

Code with comments

MVI D, num1 ; Move a number into register D

MVI E, num2 ; Move a second number into register E

CALL operation ; Call function “operation” which will perform the difference

HLT ; End the code

operation: MOV A,D ; Begin the function “operation” ; Move value stored from register D to register A

SUB E ; Subtract the value stored in register A with value stored in register E

JNC skip ; Jump to “skip” part if subtraction ≥ 0

CMA ; Complement the value stored in register A

INR A ; Increment the value stored in register A by one

skip: RET ; Return from the subroutine to the main program

Conclusion

This project allowed us to gain a greater appreciation for the evolution of programming languages and their practical applications in the real world. Additionally, we were able to gain proficiency in the Assembly 8085 language, despite the challenges we faced along the way.