

Ahsanullah University of Science & Technology

Department of Computer Science & Engineering

Course No : CSE3110
Course Title : Digital System Design Lab

Experiment No : 03
Experiment Name : SAP-1 Implementation

Submitted by-
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Introduction:

SAP-1, which is known as simple as possible computer, explained by Albert Paul Malvins which is very basic model of a microprocessor and first stage in the evolution towards modern computer. It is a bus organized computer which covers many advanced concepts along being a simple computer. Its instruction set is very limited and simple. Primary purpose of SAP is to develop a basic understanding of how a microprocessor works and interacts with memory and other parts of the system like input and output. In SAP-1, all the registers are connected to the bus with the help of tri-state buffers.

Problem statement:

Implementation of SAP-1

Kit Equipment and Budget:

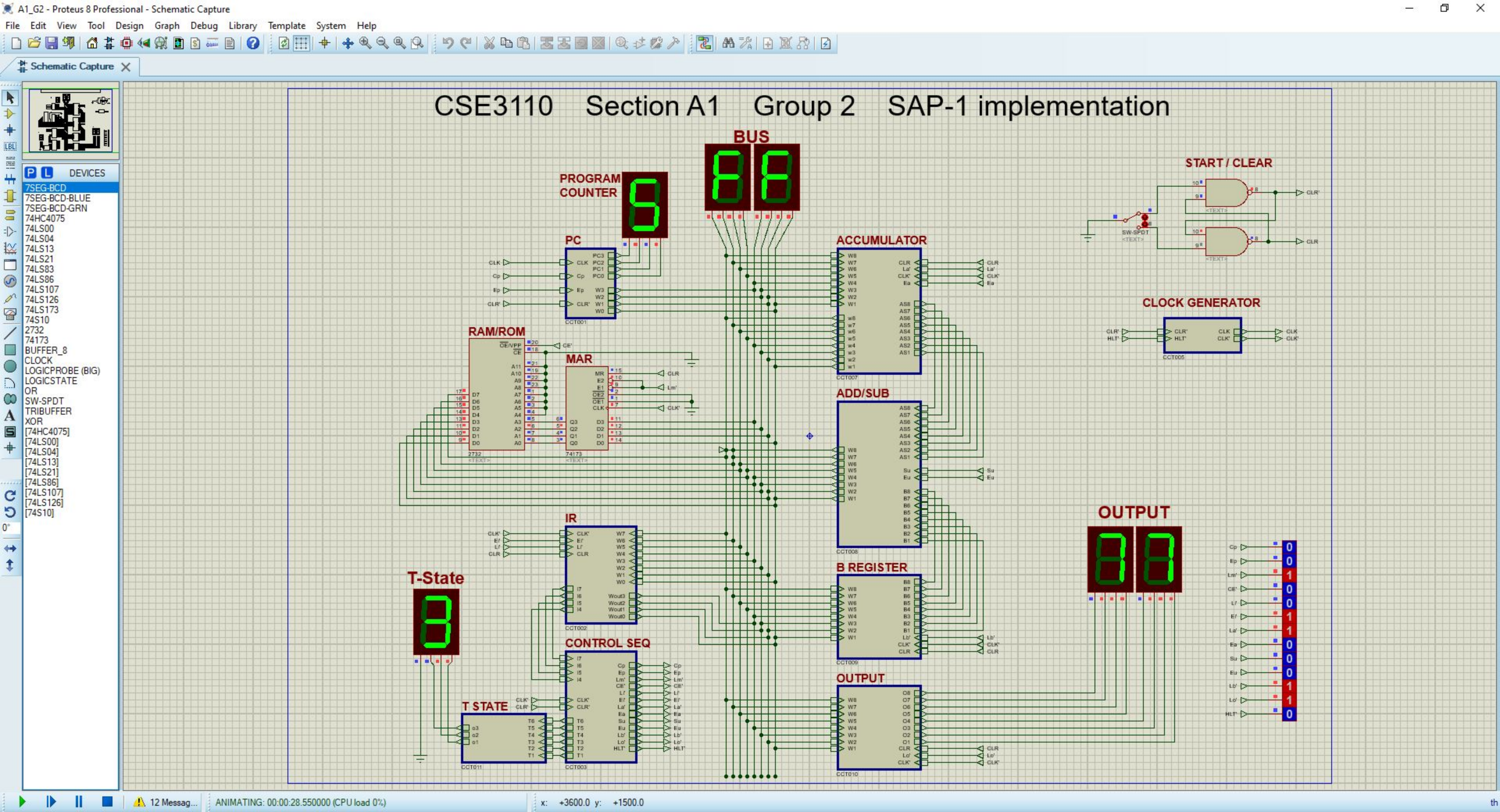
IC Number	Price (Tk)
74LS00	20
74LS04	20
74LS13	20
74LS21	20
74LS83	20
74LS86	20
74LS107	20
74LS173	20
74LS10	20
2792	25
4090	25
4071	25
4073	25
4081	25
7483	25
Buffer-8	30
Clock	40
LOGIC PROBE (BOS)	30
NOT	40
SN-SPDT	25
TRI-BUFFER	25
Total	550

Result:

Address	Code
0H	LDA 5H
1H	SUB 7H
2H	ADD 6H
3H	OUT
4H	HLT
5H	5BH
6H	9BH
7H	11H
8H	FFH
9H	FFH
AH	FFH
BH	FFH
CH	FFH
DH	FFH
EH	FFH
FH	FFH

Output:

The output of the above input will be 77H.



Conclusion :

There are some advantages of SAP-1 like flexibility. The architecture of SAP-1 is 8-bits of data bus and composed of 16×8 memory. Therefore, 16 memory locations having 8 bits in each location. It needs 4 address lines which either comes from PC (Program Counter) during computation phase or may come from the 4 address switches during the program phase. These features of SAP-1 allows to make computer operations done. A very common disadvantage of SAP-1 is the high cost of purchasing and implementation of this program. On the other hand, Only five instructions can get stored in this memory. Thus it cannot store program having more than 16 instructions. Another disadvantage is the complex built in the software.