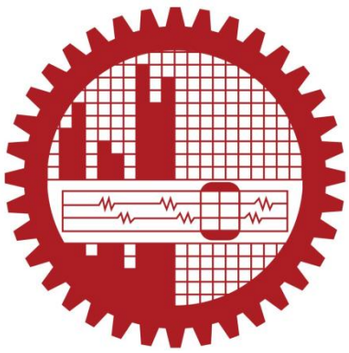
BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY



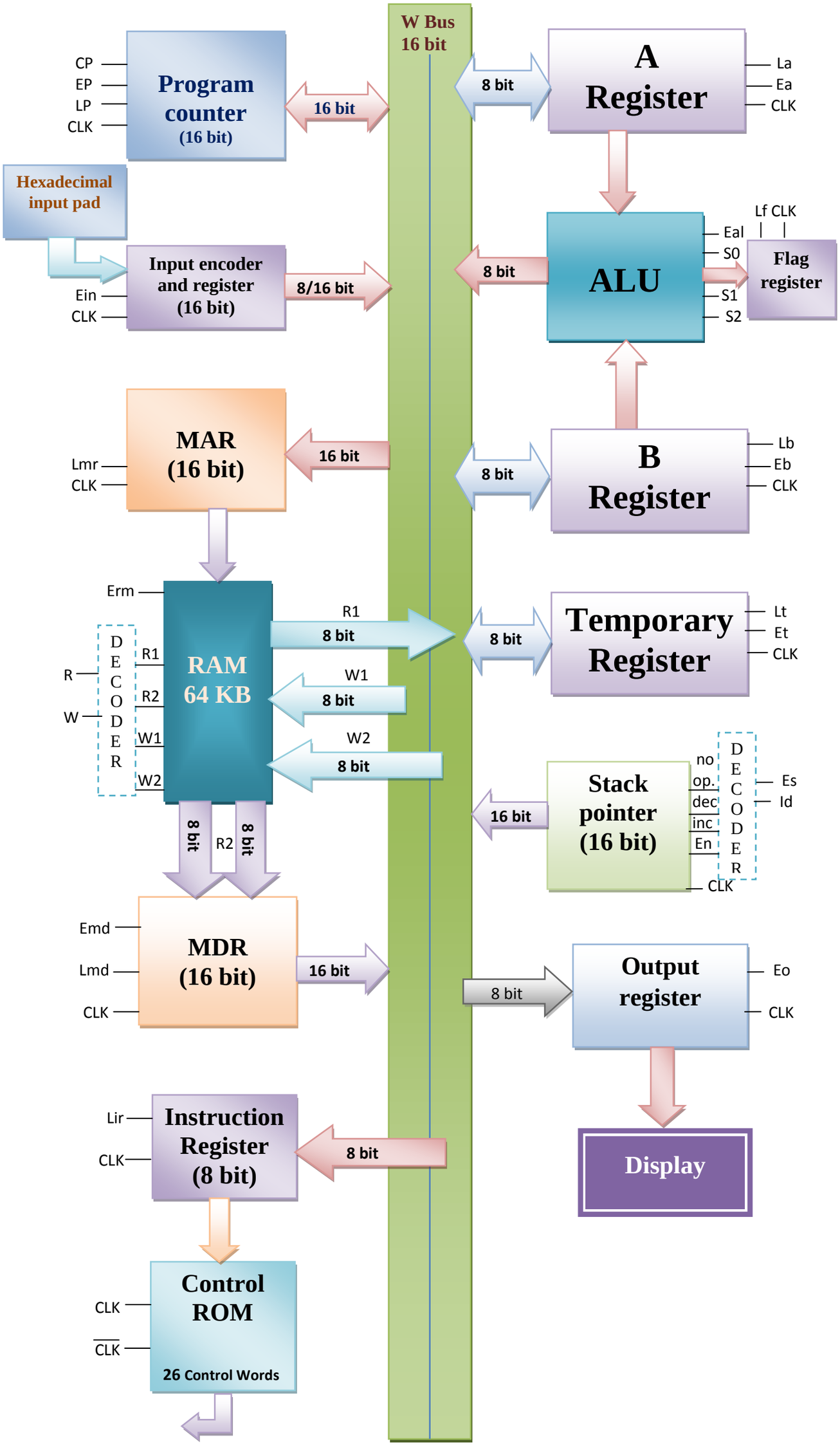
ASSIGNMENT

Modified Simple As Possible Computer (MSAP-2016)

PHASE-I SUBMISSION

Course: **EEE 315**
Microprocessor and Interfacing

Submitted by:
Name: Mohammad Adnaan
Student ID: 1206039
Level: 3 Term: II
Section: A


W Bus
16 bit
Program counter (16 bit)
CP
EP
LP
CLK
16 bit
A Register
8 bit
La
Ea
CLK
Hexadecimal input pad
Input encoder and register (16 bit)
Ein
CLK
8/16 bit
ALU
8 bit
Eal
S0
S1
S2
Lf CLK
Flag register
MAR (16 bit)
Lmr
CLK
16 bit
B Register
8 bit
Lb
Eb
CLK
Erm
RAM 64 KB
DECODER
R
W
R1
R2
W1
W2
R1
8 bit
W1
8 bit
W2
8 bit
Temporary Register
8 bit
Lt
Et
CLK
Stack pointer (16 bit)
16 bit
no op.
dec
inc
En
CLK
DECODER
Es
Id
8 bit
R2
8 bit
MDR (16 bit)
Emd
Lmd
CLK
16 bit
Output register
8 bit
Eo
CLK
Display
Instruction Register (8 bit)
Lir
CLK
8 bit
Control ROM
CLK
CLK
26 Control Words

Explanation of control words:

Cp : Increase program counter by 1
Lp: Loads to program counter
Ep: Connects program counter to bus

Ein: Connects input port to bus
Lmr: Loads to MAR

Erm: Enables ram, at Erm=1
RW= 00 means data from ram is sent to lower nibble (8 bits) of bus
=01 means data from ram is sent to MDR
=10 means data from upper nibble from bus is received by ram
=11 means data from lower nibble from bus is received by ram

Emd & Lmd:
00--- do nothing
01-- load data to lower nibble of MDR
10-- load data to higher nibble of MDR
11-- enable output of MDR

Lir: Loads to Instruction register
J: Checks whether jump condition is satisfied or not (absent in block diagram)

La: Loads to register A
Ea: Sends the data of register A to bus

Eal: Sends result of ALU to bus
Lf: Updates flag register
S0,S1,S2: 000=Addition
001= Subtraction
010= Increase value of register A by 1
011= Decrease value of register A by 1
100= And A, B
101= Shifts right the value of register A by 1 position

Lb: Loads to register B
Eb: Sends the data of register B to bus

Lt: Loads to Temporary register
Et: Sends the data of Temporary register to bus

Es,Id: 00= no operation
01= decrease stack pointer value by 1
10= increase stack pointer value by 1
11= Connects stack pointer register to bus

Eo: Enables output register

****** MDR is used in instructions involving memory location (MOV[address] ,A) to fetch data regarding 16 bit memory address from RAM and transfer it to MAR/ Program Counter. Otherwise, RAM data is directly sent to bus.