UNIVERSITY OF CALIFORNIA, RIVERSIDE

Department of Computer Science and Engineering

Department of Electrical Engineering

CS/EE120B – Logic Design

Homework 2

Given May 9, Due May 16, 2001

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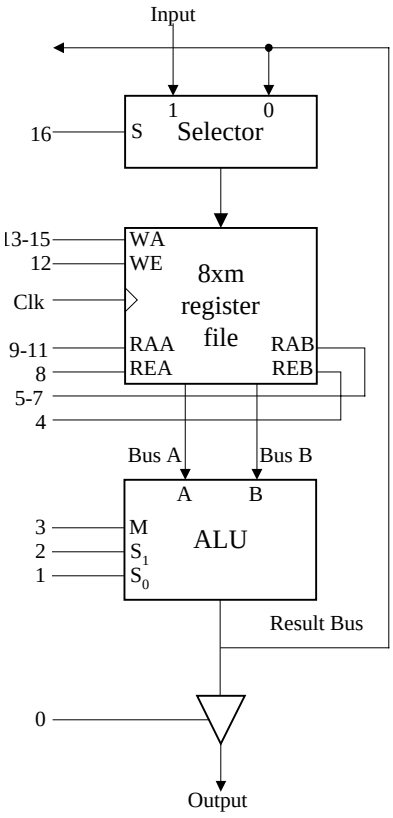
1. Using the following general datapath on the left and the ALU operations as defined on the right, write the control words required to implement the given pseudo code on the right. Your control words should be fully encoded to 0's, 1's, and don't cares, and not use any mnemonics. Don't cares should be used as much as possible. Register assignments should be in sequential order with first variable usage starting at R0. (5)



M	S_1	S_0	ALU operations
0	0	0	Set to 0
0	0	1	Set to 1
0	1	0	Increment B
0	1	1	A Mod B
1	0	0	A Multiply B
1	0	1	A Add B
1	1	0	A Subtract B
1	1	1	Pass B

ALU Functions

```
input n
prime = 1
for i = 1 to 15 do{
   if (n mod i == 0) then
      prime = 0
}
output prime
```

Pseudo Code

2. Derive the state diagram and the next-state table for the problem in question 1. (5)