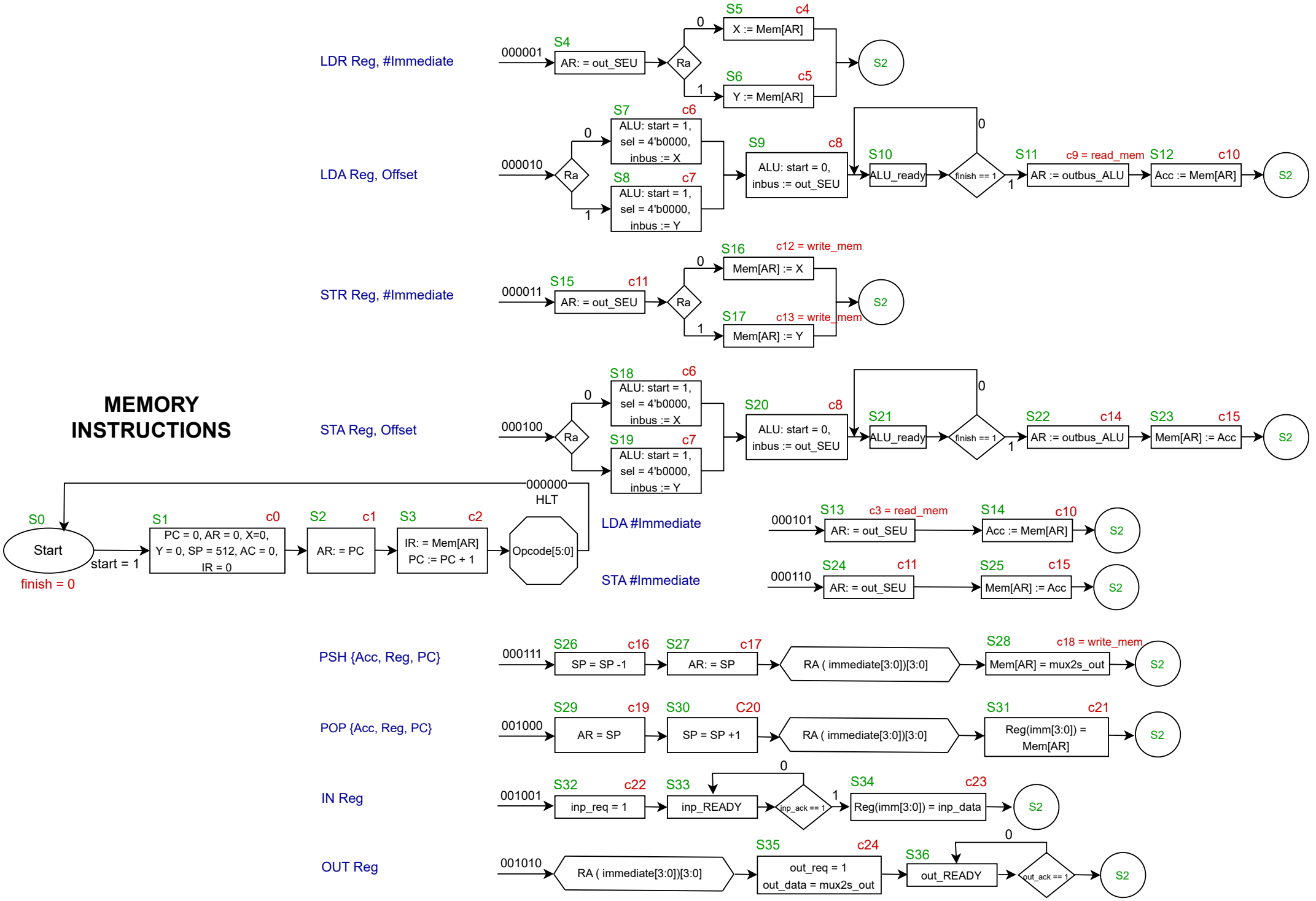
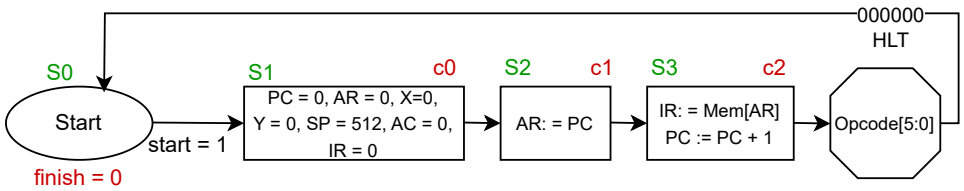
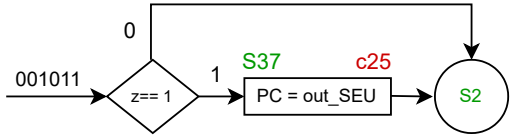
MEMORY INSTRUCTIONS



BRANCH INSTRUCTIONS



BEQ



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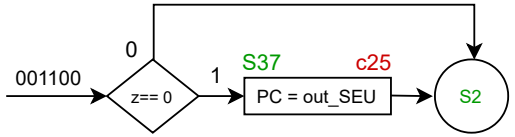

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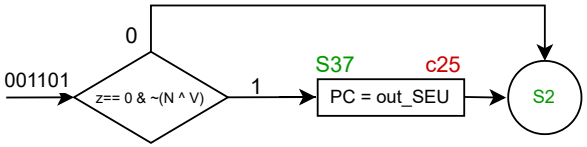

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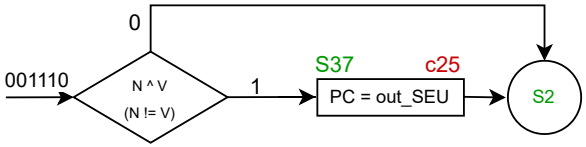

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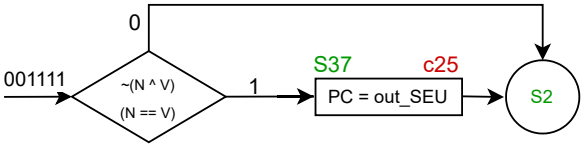

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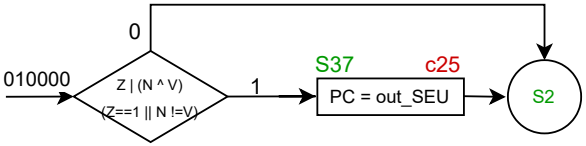

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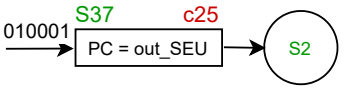
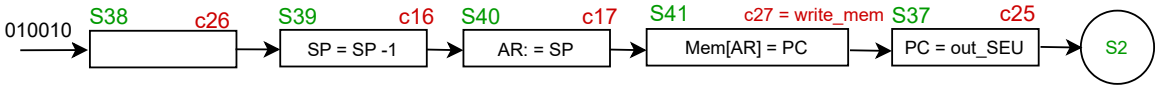
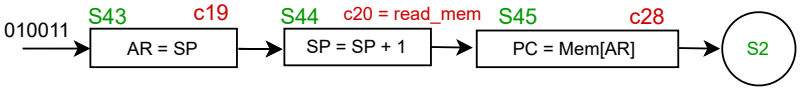


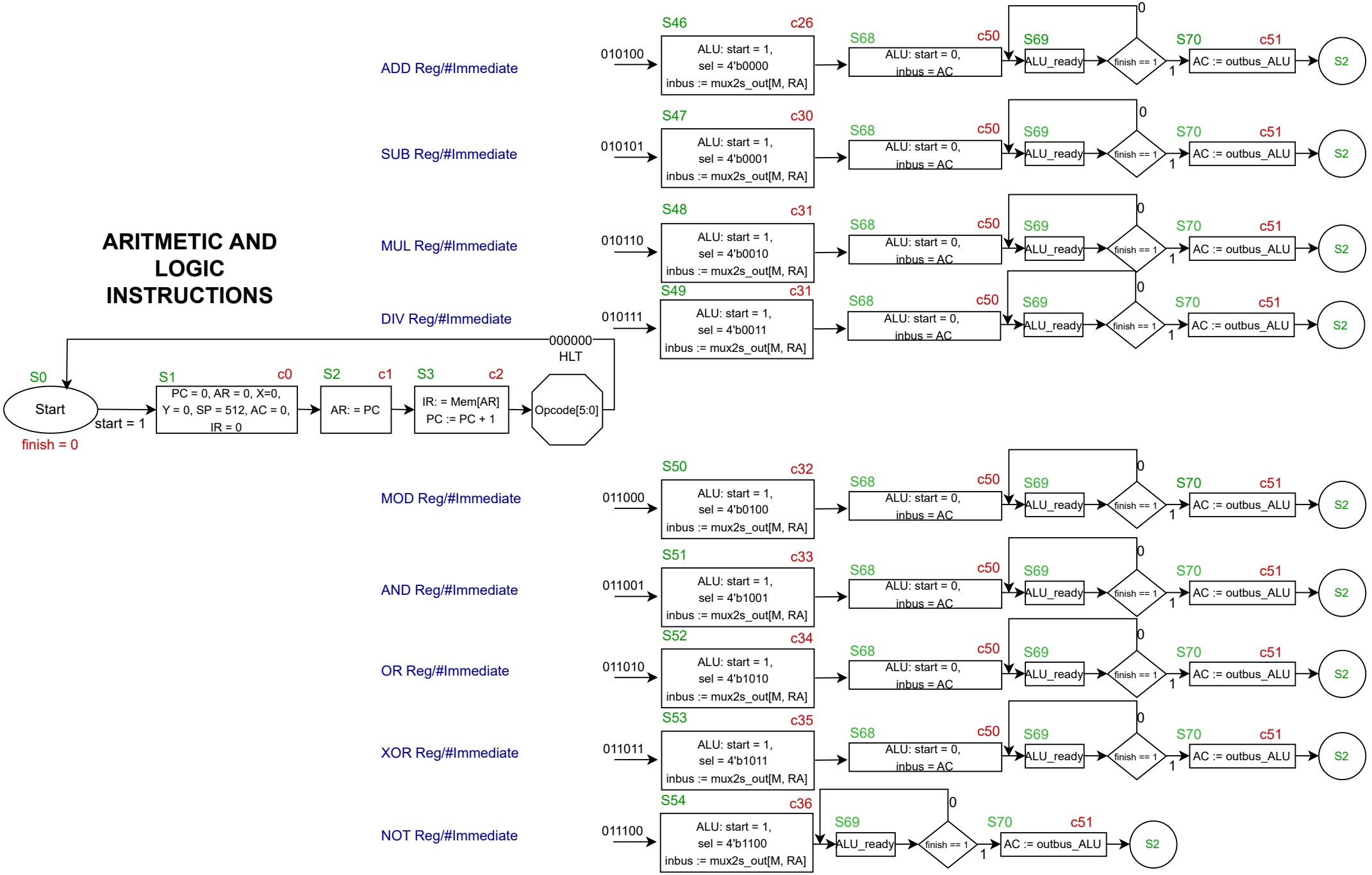
JMP



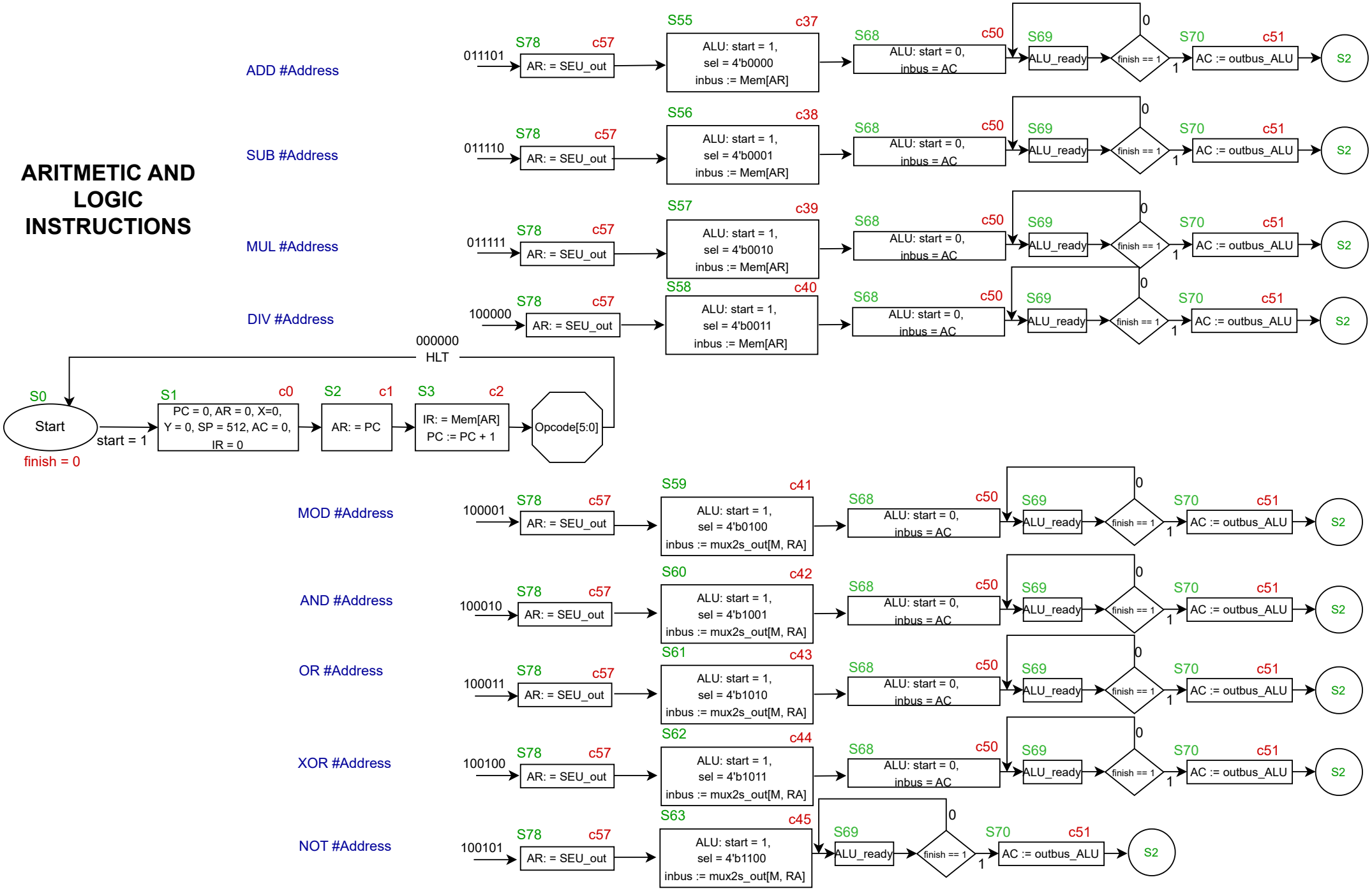
RET



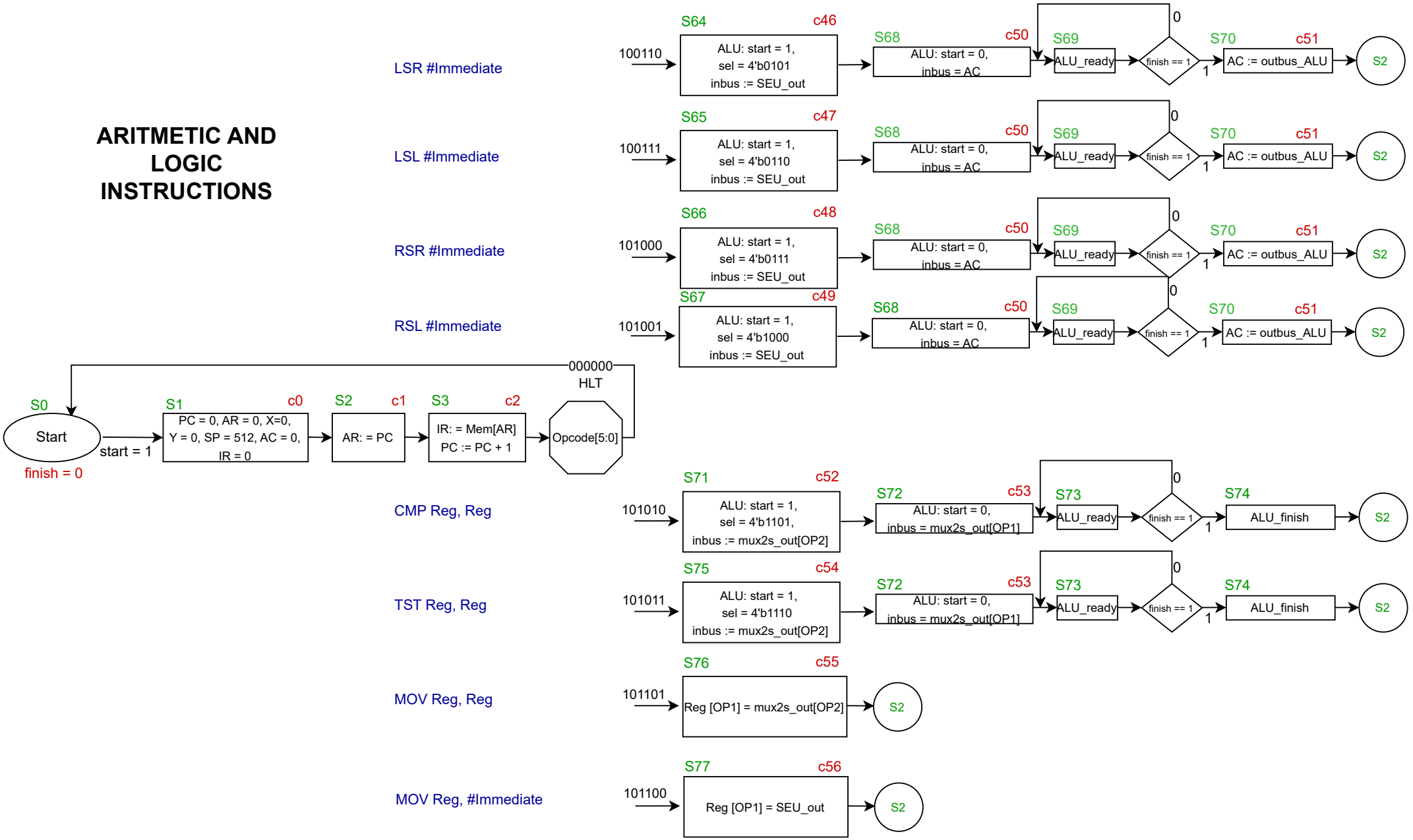
ARITMETIC AND LOGIC INSTRUCTIONS

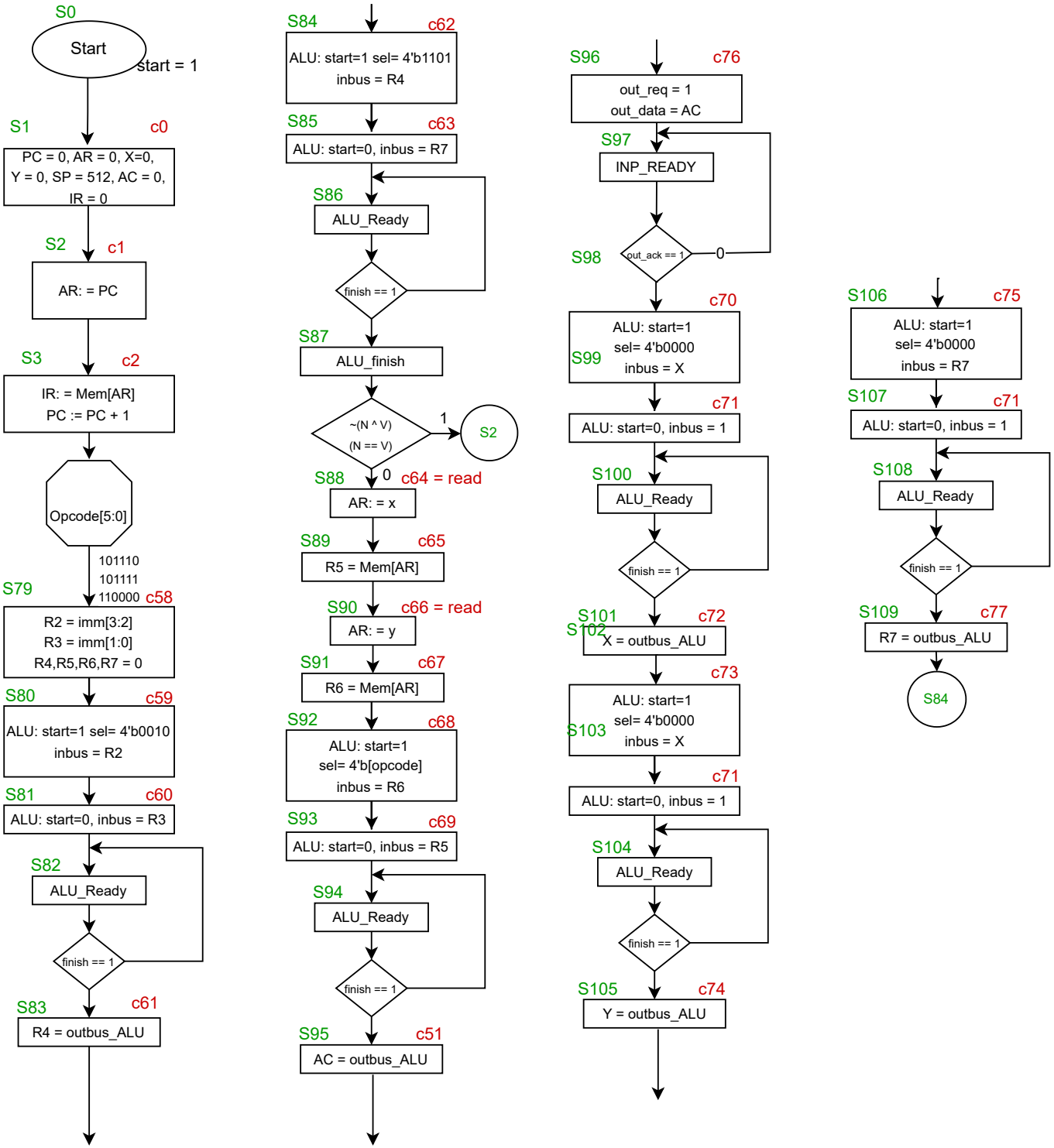


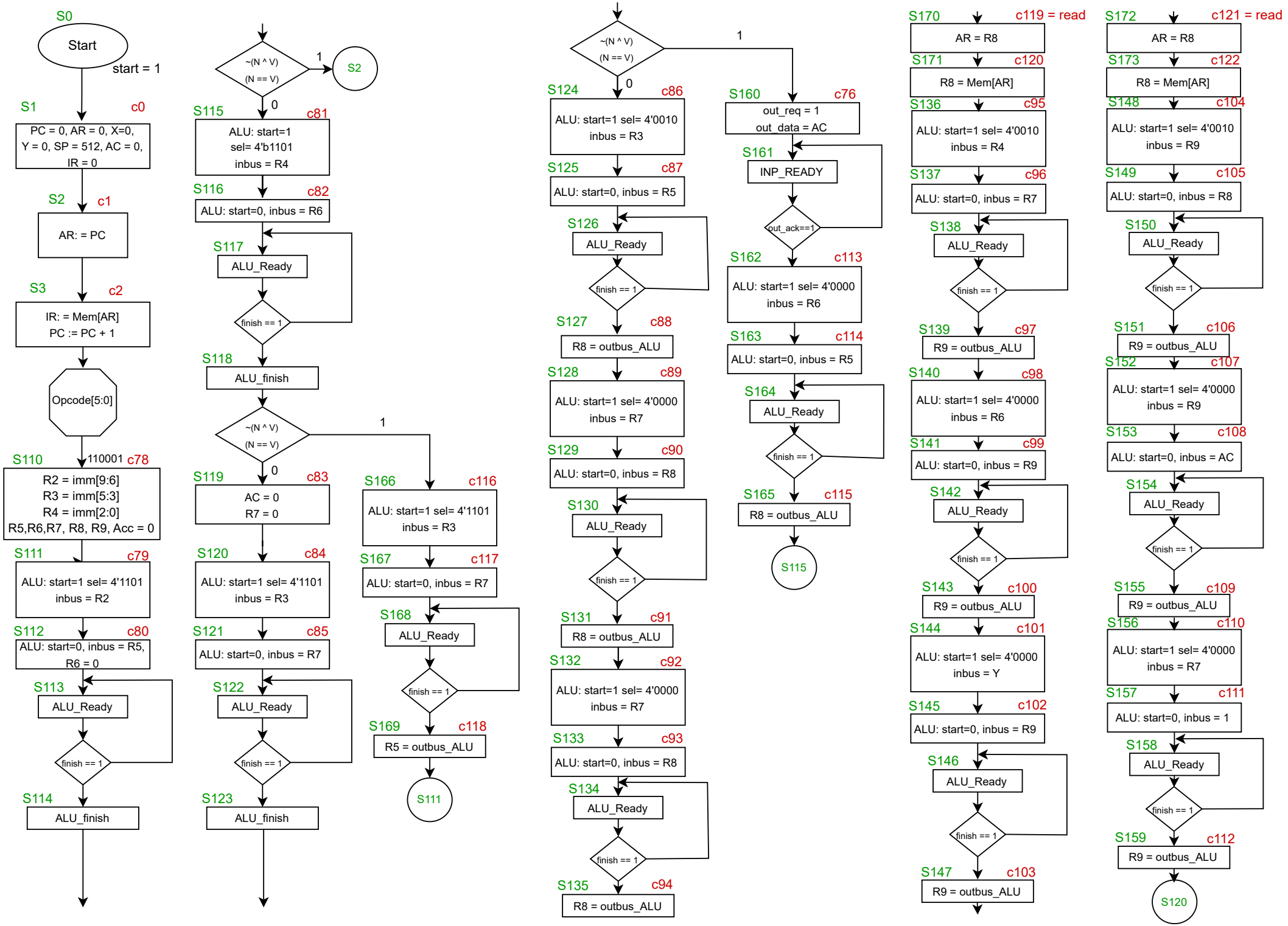
ARITMETIC AND LOGIC INSTRUCTIONS



ARITMETIC AND LOGIC INSTRUCTIONS




S0
Start
start = 1
S1
c0
PC = 0, AR = 0, X=0,
Y = 0, SP = 512, AC = 0,
IR = 0
S2
c1
AR: = PC
S3
c2
IR: = Mem[AR]
PC := PC + 1
Opcode[5:0]
101110
101111
110000
S79
c58
R2 = imm[3:2]
R3 = imm[1:0]
R4,R5,R6,R7 = 0
S80
c59
ALU: start=1 sel= 4'b0010
inbus = R2
S81
c60
ALU: start=0, inbus = R3
S82
ALU_Ready
finish == 1
S83
c61
R4 = outbus_ALU
S84
c62
ALU: start=1 sel= 4'b1101
inbus = R4
S85
c63
ALU: start=0, inbus = R7
S86
ALU_Ready
finish == 1
S87
ALU_finish
~(N ^ V)
(N == V)
1
S2
0
S88
c64 = read
AR: = x
S89
c65
R5 = Mem[AR]
S90
c66 = read
AR: = y
S91
c67
R6 = Mem[AR]
S92
c68
ALU: start=1
sel= 4'b[opcode]
inbus = R6
S93
c69
ALU: start=0, inbus = R5
S94
ALU_Ready
finish == 1
S95
c51
AC = outbus_ALU
S96
c76
out_req = 1
out_data = AC
S97
INP_READY
out_ack == 1
0
S98
c70
ALU: start=1
sel= 4'b0000
inbus = X
S99
c71
ALU: start=0, inbus = 1
S100
ALU_Ready
finish == 1
S101
c72
X = outbus_ALU
S102
c73
ALU: start=1
sel= 4'b0000
inbus = X
S103
c71
ALU: start=0, inbus = 1
S104
ALU_Ready
finish == 1
S105
c74
Y = outbus_ALU
S106
c75
ALU: start=1
sel= 4'b0000
inbus = R7
S107
c71
ALU: start=0, inbus = 1
S108
ALU_Ready
finish == 1
S109
c77
R7 = outbus_ALU
S84


S0
Start
start = 1
S1
c0
PC = 0, AR = 0, X=0,
Y = 0, SP = 512, AC = 0,
IR = 0
S2
c1
AR: = PC
S3
c2
IR: = Mem[AR]
PC := PC + 1
Opcode[5:0]
S110
110001 c78
R2 = imm[9:6]
R3 = imm[5:3]
R4 = imm[2:0]
R5,R6,R7, R8, R9, Acc = 0
S111
c79
ALU: start=1 sel= 4'1101
inbus = R2
S112
c80
ALU: start=0, inbus = R5,
R6 = 0
S113
ALU_Ready
finish == 1
S114
ALU_finish
~(N ^ V)
(N == V)
1
S2
0
S115
c81
ALU: start=1
sel= 4'b1101
inbus = R4
S116
c82
ALU: start=0, inbus = R6
S117
ALU_Ready
finish == 1
S118
ALU_finish
~(N ^ V)
(N == V)
1
0
S119
c83
AC = 0
R7 = 0
S120
c84
ALU: start=1 sel= 4'1101
inbus = R3
S121
c85
ALU: start=0, inbus = R7
S122
ALU_Ready
finish == 1
S123
ALU_finish
S166
c116
ALU: start=1 sel= 4'1101
inbus = R3
S167
c117
ALU: start=0, inbus = R7
S168
ALU_Ready
finish == 1
S169
c118
R5 = outbus_ALU
S111
~(N ^ V)
(N == V)
1
0
S124
c86
ALU: start=1 sel= 4'0010
inbus = R3
S125
c87
ALU: start=0, inbus = R5
S126
ALU_Ready
finish == 1
S127
c88
R8 = outbus_ALU
S128
c89
ALU: start=1 sel= 4'0000
inbus = R7
S129
c90
ALU: start=0, inbus = R8
S130
ALU_Ready
finish == 1
S131
c91
R8 = outbus_ALU
S132
c92
ALU: start=1 sel= 4'0000
inbus = R7
S133
c93
ALU: start=0, inbus = R8
S134
ALU_Ready
finish == 1
S135
c94
R8 = outbus_ALU
S160
c76
out_req = 1
out_data = AC
S161
INP_READY
out_ack==1
S162
c113
ALU: start=1 sel= 4'0000
inbus = R6
S163
c114
ALU: start=0, inbus = R5
S164
ALU_Ready
finish == 1
S165
c115
R8 = outbus_ALU
S115
S170
c119 = read
AR = R8
S171
c120
R8 = Mem[AR]
S136
c95
ALU: start=1 sel= 4'0010
inbus = R4
S137
c96
ALU: start=0, inbus = R7
S138
ALU_Ready
finish == 1
S139
c97
R9 = outbus_ALU
S140
c98
ALU: start=1 sel= 4'0000
inbus = R6
S141
c99
ALU: start=0, inbus = R9
S142
ALU_Ready
finish == 1
S143
c100
R9 = outbus_ALU
S144
c101
ALU: start=1 sel= 4'0000
inbus = Y
S145
c102
ALU: start=0, inbus = R9
S146
ALU_Ready
finish == 1
S147
c103
R9 = outbus_ALU
S172
c121 = read
AR = R8
S173
c122
R8 = Mem[AR]
S148
c104
ALU: start=1 sel= 4'0010
inbus = R9
S149
c105
ALU: start=0, inbus = R8
S150
ALU_Ready
finish == 1
S151
c106
R9 = outbus_ALU
S152
c107
ALU: start=1 sel= 4'0000
inbus = R9
S153
c108
ALU: start=0, inbus = AC
S154
ALU_Ready
finish == 1
S155
c109
R9 = outbus_ALU
S156
c110
ALU: start=1 sel= 4'0000
inbus = R7
S157
c111
ALU: start=0, inbus = 1
S158
ALU_Ready
finish == 1
S159
c112
R9 = outbus_ALU
S120