HW10, Artificial Intelligence

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#1)

#2)

#3) (extra credit) The controlled grammar for the cannibals and missionaries is as follows:

C is the number of cannibals on side B of the river, M is the number of missionaries.

Q\_1 S(c, m) 🡪 A(c+1, m+1) F\_t =2 F\_f = {empty set}

Q\_2 A(c,m) 🡪 p(c, m)A(F\_1(c, m) , f\_2(m)) F\_t = 2 F\_f = 3

Q\_3 A(c,m) 🡪 p(c,m)

Conditions for true/false in the different states: Q\_1 = T, Q\_2 = T if c > 0 or m > 0; Q\_2(c, m) = F if ((c = 3) AND(m=3)) or (c > m) or ((3 – c) > (3 – m)) Q\_3(c, m) = T if ((c = 3) AND (m = 3))

The function f\_1(c, m) will be defined as: if (c = 1) AND (m = 1), then f\_1(c, m) = c+2 otherwise if (c != 1) AND (m != 3) f\_1(c, m) = c – 1 else f\_1(c, m) = c+1

The function f\_2(m) is defined as: if (m = 1) then f\_2(m) = m-1 otherwise if (m = 0) then f\_2(m) = m+2 else if m = 3 f\_2(m) = m else f\_2(m) = m+1.

Now, this sort of cheats since it has the solution more or less ‘programmed’ into it, but it does work! Yay!