

Passing to state 3, it moves left one space to the rightmost of the n 1s, then cycles between states 3 and 4 erasing the n 1s, moving left.

When the n 1s are erased it is in state 4 two spaces to the right of the rightmost of the m 1s. It has to move to state 3, and then to state 5, where it stops, scanning the rightmost of the m 1s, as required.

This machine is suitable for the task. ✓

c) Try the same test data ($m=n=2$)

11011 11011 11011 11011 11001
1 1 1 2 3

11001 11000 110000 110000
2 3 2 2

110000 110000 110000 100000 100000 100000
2 2 2 3 2 2

100 000 000 000
2 3 2 2

This machine does not work as required with $m=n=2$. This is the general case. *also so for*

After moving to the rightmost of the m 1s, then to the position of the zero separating the m 1s and the n 1s, in state 1, the machine passes to state 2, moving right one more space, to the leftmost of the n 1s.

It then cycles between states 2 and 3, erasing ones and moving