Assignment 1

Q. Construct the a Turing machine for the language $L = \{0^n 1^n 2^n\}$ where $n \geq 1$.

⇒ Algorithm :-

Step 1 - Replace 0 by X and move right, Go to state Q1.

Step 2 - Replace 0 by 0 and move right, Remain on same state.
Replace Y by Y and move right, Remain on same state.
Replace 1 by Y and move right, go to state Q2.

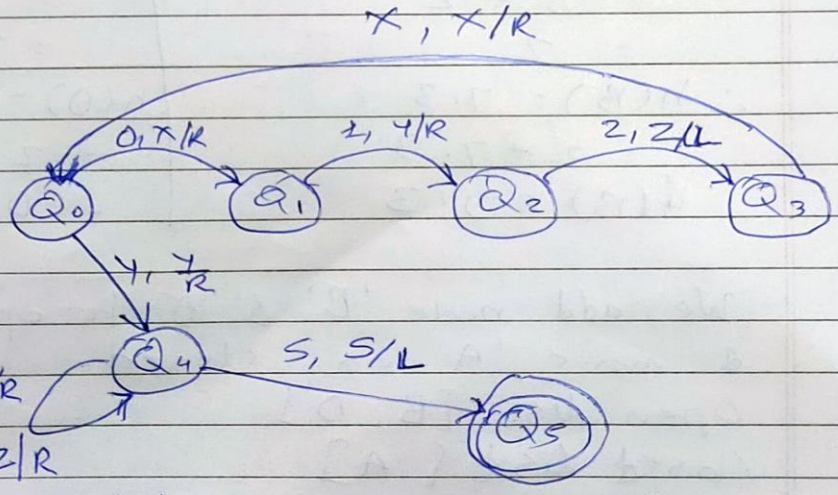
Step 3 - Replace 1 by 1 and move right, Remain on ~~state~~ state.
Replace Z by Z and move right, Remain on same state.
Replace 2 by Z and move right, go to state Q3.

Step 4 - Replace 1 by 1 and move left, Remain on same state.
Replace 0 by 0 and move left, Remain on same state.

Replace Z by Z and move left, Remain on same state.
Replace Y by Y and move left, Remain on same state.
Replace X by X and move right, go to state Q1.

Step 5 - If symbol is Y and move right and go to state Q4 else go to step 1.

Step 6 - Replace Z by Z and move right, remain on same state.
Replace Y by Y and move right, Remain on same state.
If symbol $ replace it by $ and move left, string is accepted, go to final state Q5.



Initial Tape = 0 11 222
Final Tape = B YYBZZZ