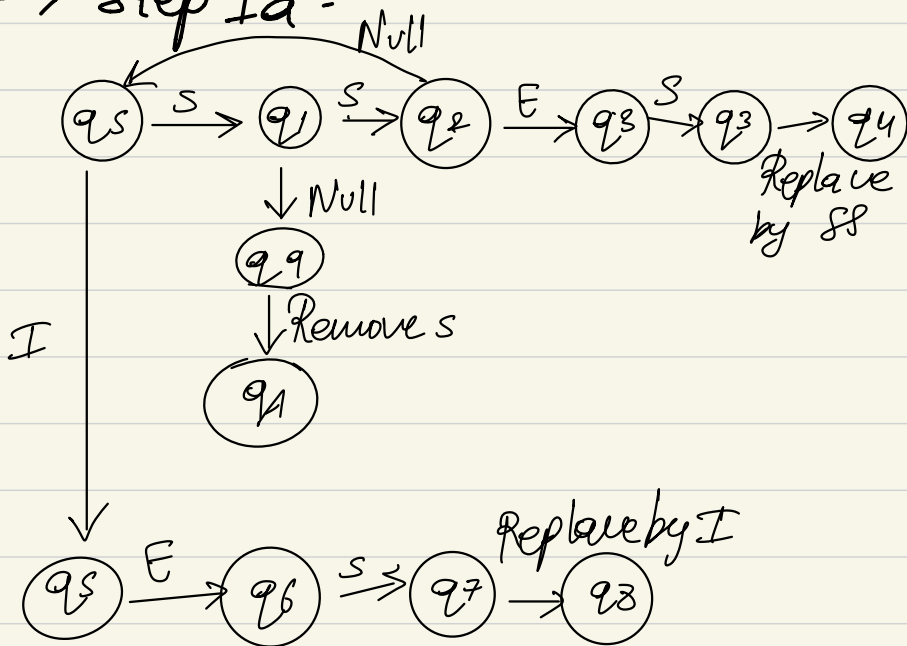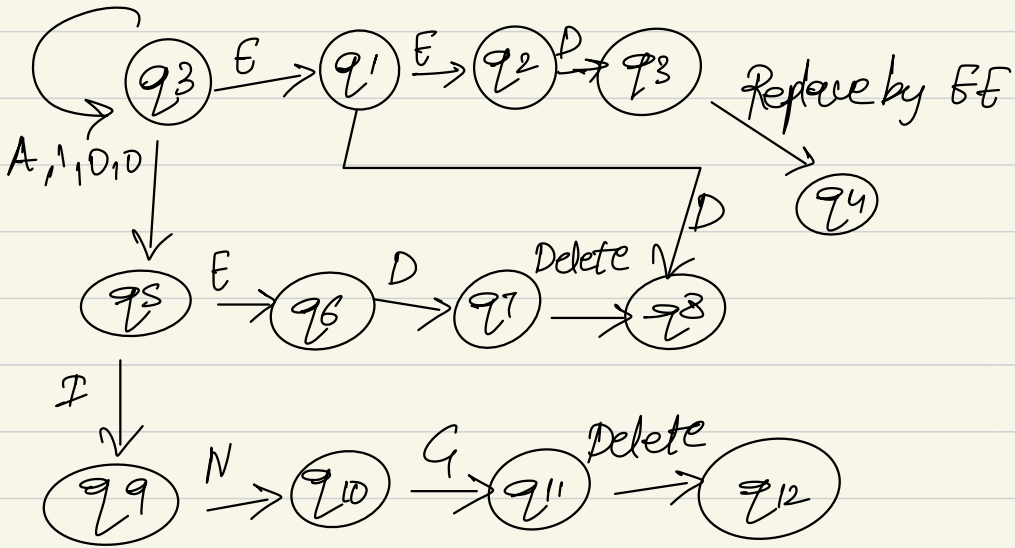# Question 1

Part 1: Read Porter (1980) or see Martin Porter's official homepage on the Porter stemer. Implement one of the steps of the Porter Stemmer as a transducer.

→ **Step 1a:**

Null

(qs) $\xrightarrow{S}$ $(q1)$ $\xrightarrow{S}$ $(q2)$ $\xrightarrow{E}$ $(q3)$ $\xrightarrow{S}$ $(q3)$ $\longrightarrow$ $(q4)$
Replace
by SS

$(q1)$ ↓ Null

$(q9)$

↓ Removes

$(q4)$

I

(qs) $\xrightarrow{E}$ $(q6)$ $\xrightarrow{S}$ $(q7)$ $\xrightarrow{\text{Replace by } I}$ $(q8)$

Step 1b:

Non Vowels.

$q_3 \xrightarrow{E} q_1 \xrightarrow{E} q_2 \xrightarrow{D} q_3$ — Replace by EE

A, I, O, O (self loop on q_3)

$q_5 \xrightarrow{E} q_6 \xrightarrow{D} q_7 \xrightarrow{Delete} q_8$

$\xrightarrow{D} q_4$

I — $q_9 \xrightarrow{N} q_{10} \xrightarrow{G} q_{11} \xrightarrow{Delete} q_{12}$

Step 1c:

Non Vowel

$q_5 \xrightarrow{A, E, I, D, D} q_1 \xrightarrow{Y \, or \, y} q_2 \xrightarrow{Replace \, by \, I} q_3$

Non Vowel (self loop on q_1)