Jason Salante Herrera
2022702015 3
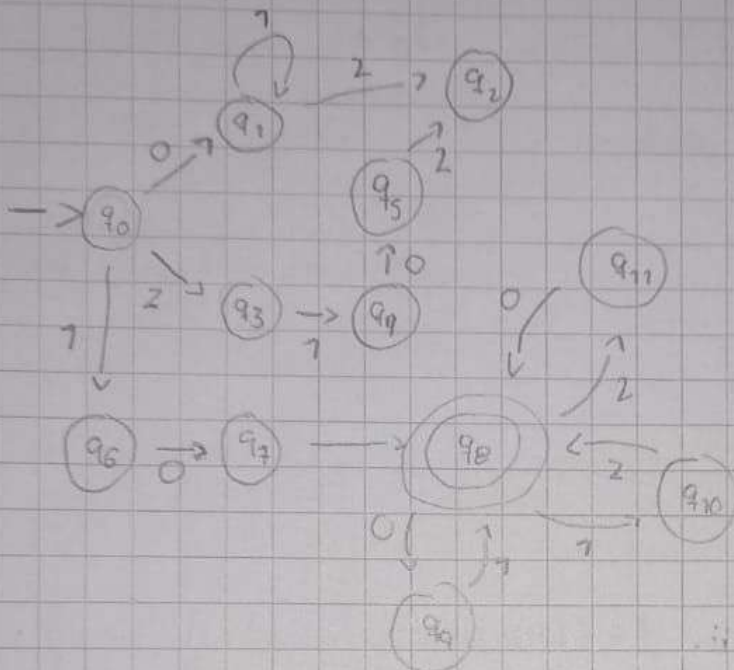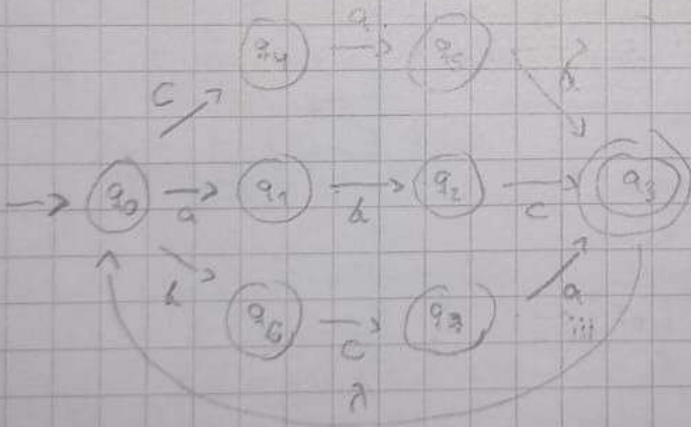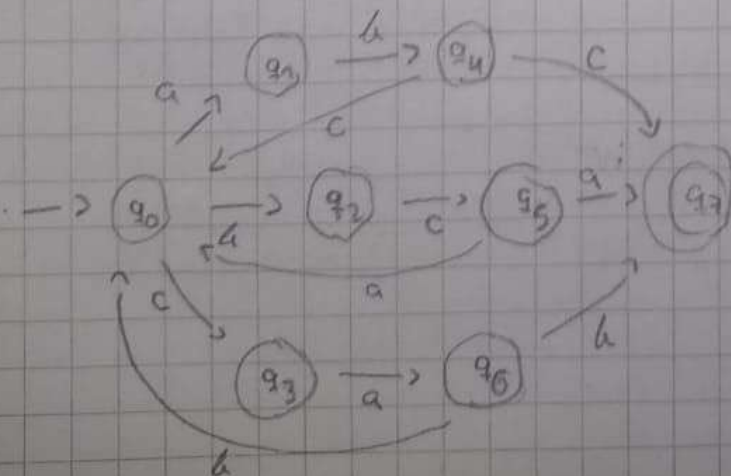
Punto 2

1. $\Sigma = \{0,1,2\}$ $L = \{01^*2 \cup 2102)^* 101 (01 \cup 120 20)^*$

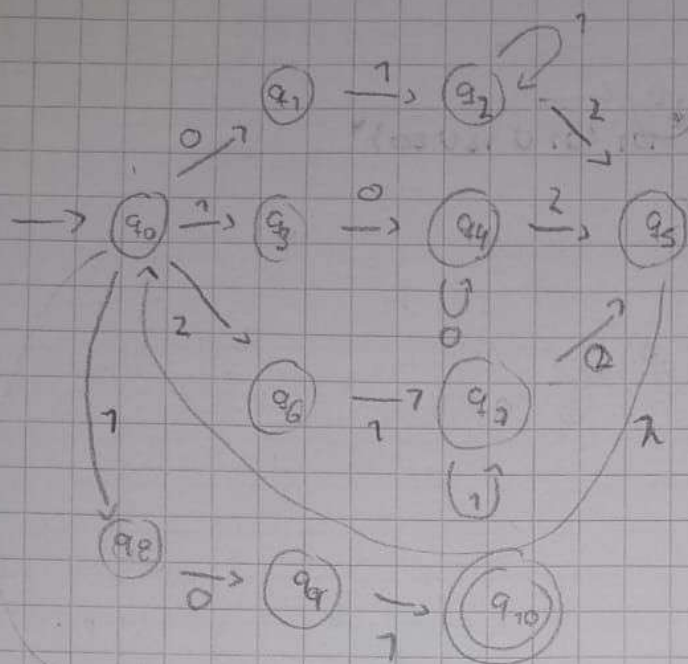

ii. $\Sigma = \{a,b,c\}$ $L = (abc \cup bca \cup cab)(abc \cup bca \cup cab)^*$

iii. $\Sigma = \{a,b,c\}$ $\overline{L = \{01^*2 \cup 10^*2 \cup}$
$L = \{a, bc \cup bca\}^*(abc \cup bca \cup cab)$

IV. $\Sigma = \{0,1,2\}$ $\mathcal{L} = (01^*2 \cup 10^*2 \cup 21^*0)^* (01 \cup 12 \cup 20)^* 101$

Punto 2

i. $\mathcal{L} = (0^+ 10^+ 1^*)^*$

$$\mathcal{G} = \begin{cases} S \to 0A \mid \lambda \\ A \to 0A \mid 1B \\ B \to 0B \mid 0C \\ C \to 1C \mid 1S \mid \lambda \end{cases}$$

ii. $\mathcal{L} = ((\lambda \cup a \cup ac)c(a \cup b) \cup (b \cup c)a$
$(\lambda \cup c \cup ca))((b \cup c)^* a) \cup \lambda)$

$$\mathcal{G} = \begin{cases} A \to aA \mid bA \mid bB \mid cB \\ A \to cB \mid cD \\ B \to aA \mid aD \\ D \to aE \\ E \to bE \mid cE \mid \lambda \end{cases}$$

Punto 3

i
$$\mathcal{G} = \begin{cases} A \to aAd \\ A \to aAd \mid bBc \\ B \to bBc \mid \lambda \end{cases}$$

ii
$$\mathcal{G} = \begin{cases} A \to AB \\ A \to aAb \mid ab \\ B \to cBd \mid cd \end{cases}$$

iii
$$\mathcal{G} = \begin{cases} A \to A \mid B \\ A \to aBd \\ B \to aBd \mid bCc \\ C \to bCc \mid \lambda \\ D \to EF \\ E \to aEb \mid ab \\ F \to cFd \mid cd \end{cases}$$

iv
$$\mathcal{G} = \begin{cases} A \to AB \\ A \to aAc \mid \lambda \\ B \to bBc \mid bc \end{cases}$$

Punto 4

i. $w_1 = abab$

S
$\downarrow$
$aB \longrightarrow abab$
$\downarrow$
bab

ii $w_2 = babacc$

S
$\downarrow$
BaC
$\swarrow \quad \searrow$
$baB \quad cC \longrightarrow babacc$
$\qquad\quad \downarrow$
$\qquad\quad cC$
$\qquad\quad \downarrow$
$\qquad\quad \lambda$

iii $w_3 = ababababc$

S
$\downarrow$
ABC
$\swarrow \quad \downarrow \quad \searrow$
$a \quad BAB \quad cC$
$\qquad\qquad\quad \downarrow$
$\qquad\qquad\quad \lambda$

Punto 5

i $w_1 = 42,236$

$\langle real \rangle$
$\downarrow \qquad\qquad\qquad \searrow \qquad\qquad\qquad\qquad\qquad \searrow$
$\langle digits \rangle \qquad\qquad\qquad \langle decimal \rangle \qquad\qquad\qquad\qquad \langle exp \rangle$
$\downarrow \qquad \searrow \qquad\qquad\quad \downarrow \qquad \searrow \qquad\qquad\qquad\quad \downarrow$
$\langle digits \rangle \quad \langle digits \rangle \qquad \langle digits \rangle \quad \langle digits \rangle \qquad\qquad \lambda$
$\downarrow \qquad\qquad \downarrow \qquad\qquad \downarrow \qquad \swarrow \quad \searrow$
$4 \qquad\qquad 2 \qquad\qquad 2 \qquad \langle digits \rangle \; \langle digits \rangle$
$\qquad\qquad\qquad\qquad\qquad\qquad\qquad \downarrow \qquad\quad \downarrow$
$\qquad\qquad\qquad\qquad\qquad\qquad\qquad 3 \qquad\quad 6$

ii $w_2 = 321.25 \, E + 35$

$\langle real \rangle$
$\downarrow \qquad\qquad \searrow \qquad\qquad\qquad \searrow$
$\langle digits \rangle \qquad\qquad \langle decimal \rangle \qquad\qquad \langle exp \rangle$
$\downarrow \qquad \searrow \qquad\qquad\quad \downarrow \qquad\qquad\quad \downarrow \qquad\qquad \searrow$
$3 \qquad \langle digits \rangle \qquad \langle digits \rangle \qquad\quad E + \qquad \langle digits \rangle$
$\qquad \swarrow \quad \searrow \qquad \downarrow \quad \searrow \qquad\qquad\qquad \downarrow$
$\qquad 2 \qquad 1 \qquad 3 \qquad 5 \qquad\qquad\qquad \langle digits \rangle \qquad \langle digits \rangle$
$\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad \downarrow \qquad\qquad \downarrow$
$\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad 3 \qquad\qquad 5$

iii $w_3 = 0.8\ E9$

```
<real>
  ↓                    ────────────────
<digits>      <decimal>        <exp>  ──→
  ↓              ↓               ↓
  0          <digits>           E        <digits>
               ↓                           ↓
               8                           9
```

iv $w_4 = 0.8\ E+9$

```
<real>
  ↓                 ────────────────
<digits>     <decimal>      →<exp>  ──→
  ↓             ↓             ↓
  0         <digits>         E+        <digits>
              ↓                          ↓
              8                          9
```

Punto 6

i. $w_1 = My\ Variable$

```
<identifier>
  ↓            ↘
<letter>      <lyd>
  ↓             ↓
  m          <letter>   <lyd>
               ↓          ↓
               y       <letter>   <lyd>
                         ↓          ↓
                         v       <letter>   <lyd>
                                   ↓          ↙    ↘
                                   a       <letter>  <lyd>
                                            ↓         ↓      ↘
                                            r      <letter>  <lyd>
                                                    ↓         ↙   ↘
                                                    i      <letter>  <lyd>
                                                            ↓         ↙   ↘
                                                            a      <letter>  <lyd>
                                                                    ↓         ↙   ↘
                                                                    b      <letter>  <lyd>
                                                                            ↓         ↙   ↘
                                                                            l      <letter>  <lyd>
                                                                                    ↓          ↓
                                                                                    e          λ
```
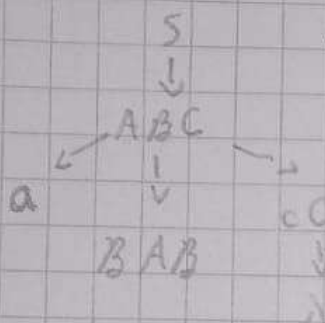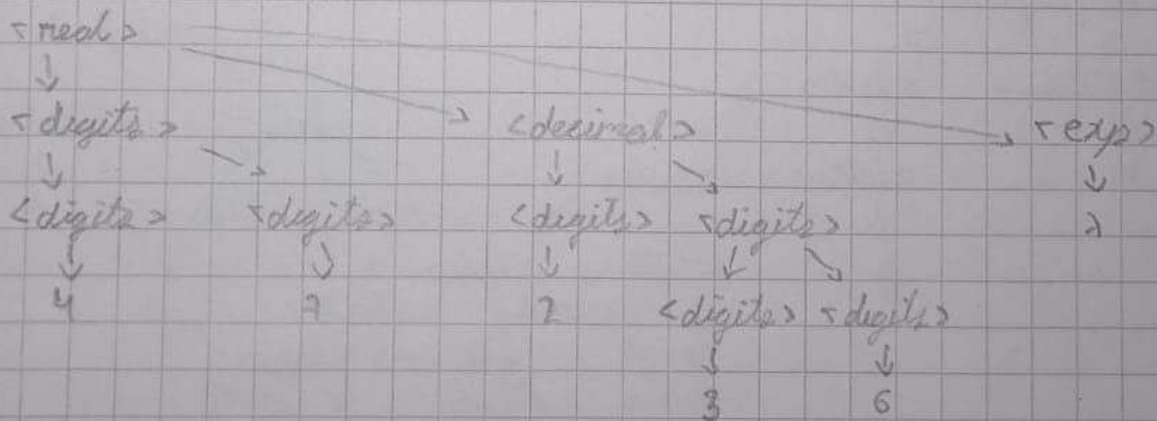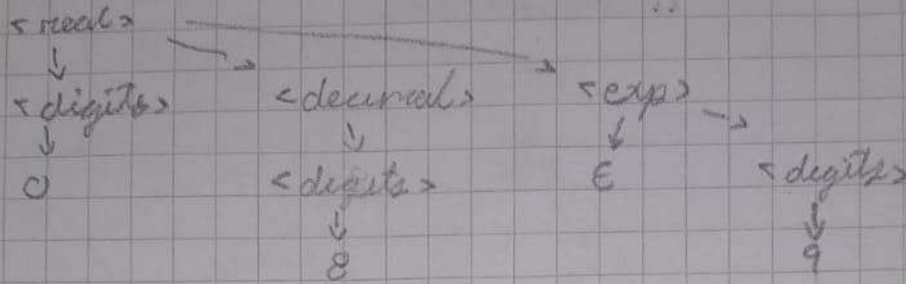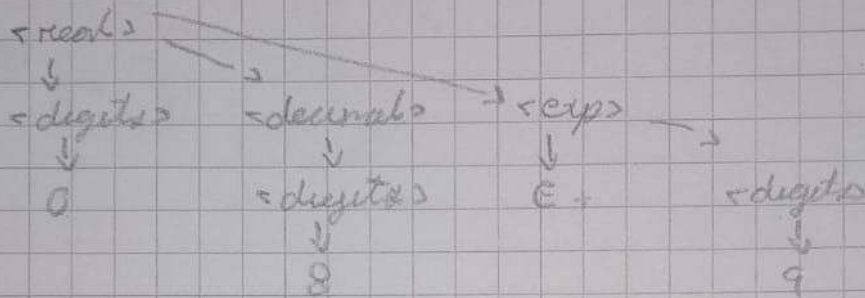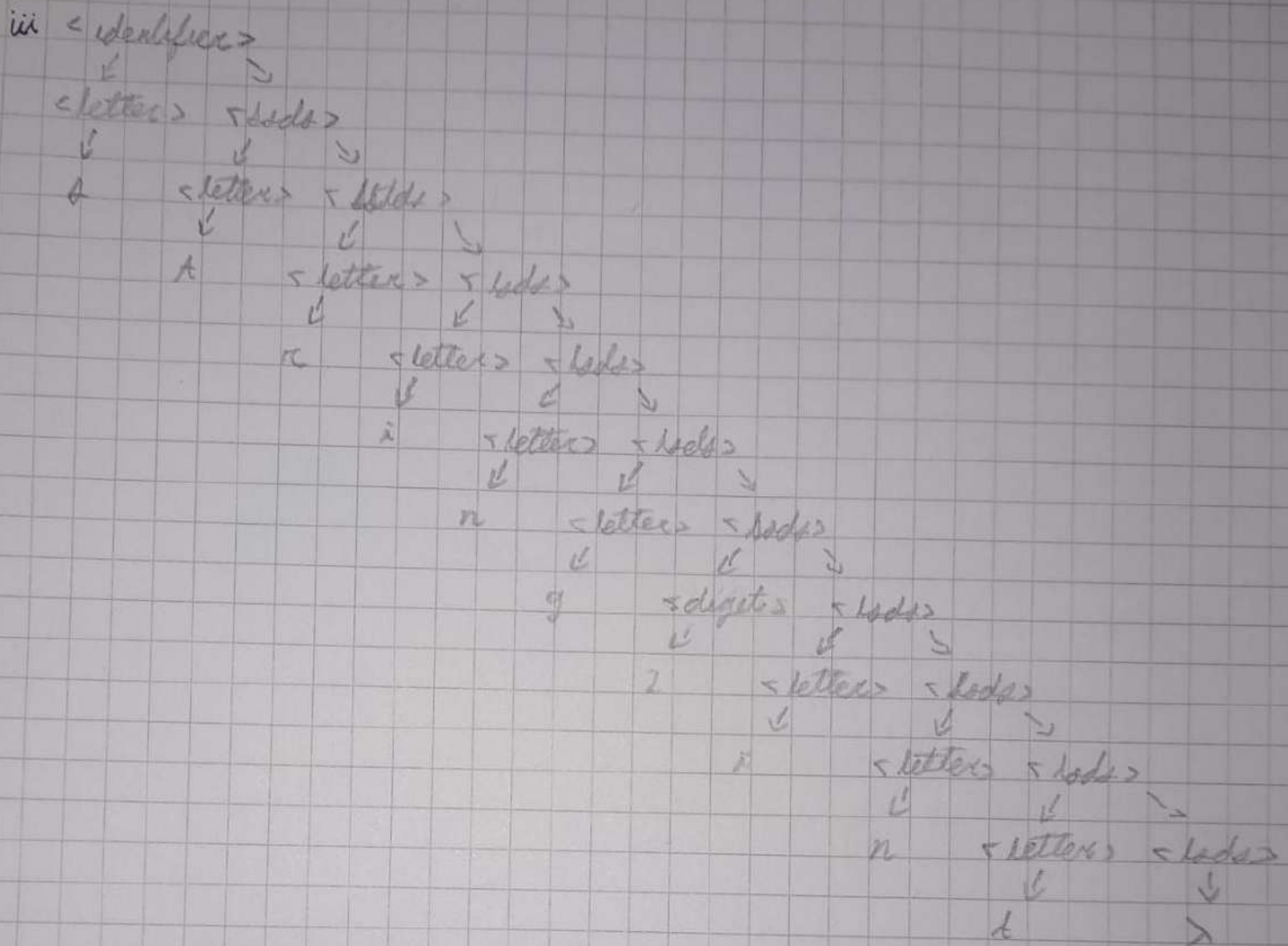
iii <identifier>
<letter> < isds >
A <letter> < isds >
A <letter> < isds >
r <letter> < isds >
i <letter> < isds >
n <letter> < isds >
g <digits> < isds >
2 <letter> < isds >
i <letter> < isds >
n <letter> < isds >
t >

ii <identifier>
<letter> < isds >
t <letter> < isds >
e <letter> < isds >
n <letter> < isds >
p <digits> < isds >
2 λ
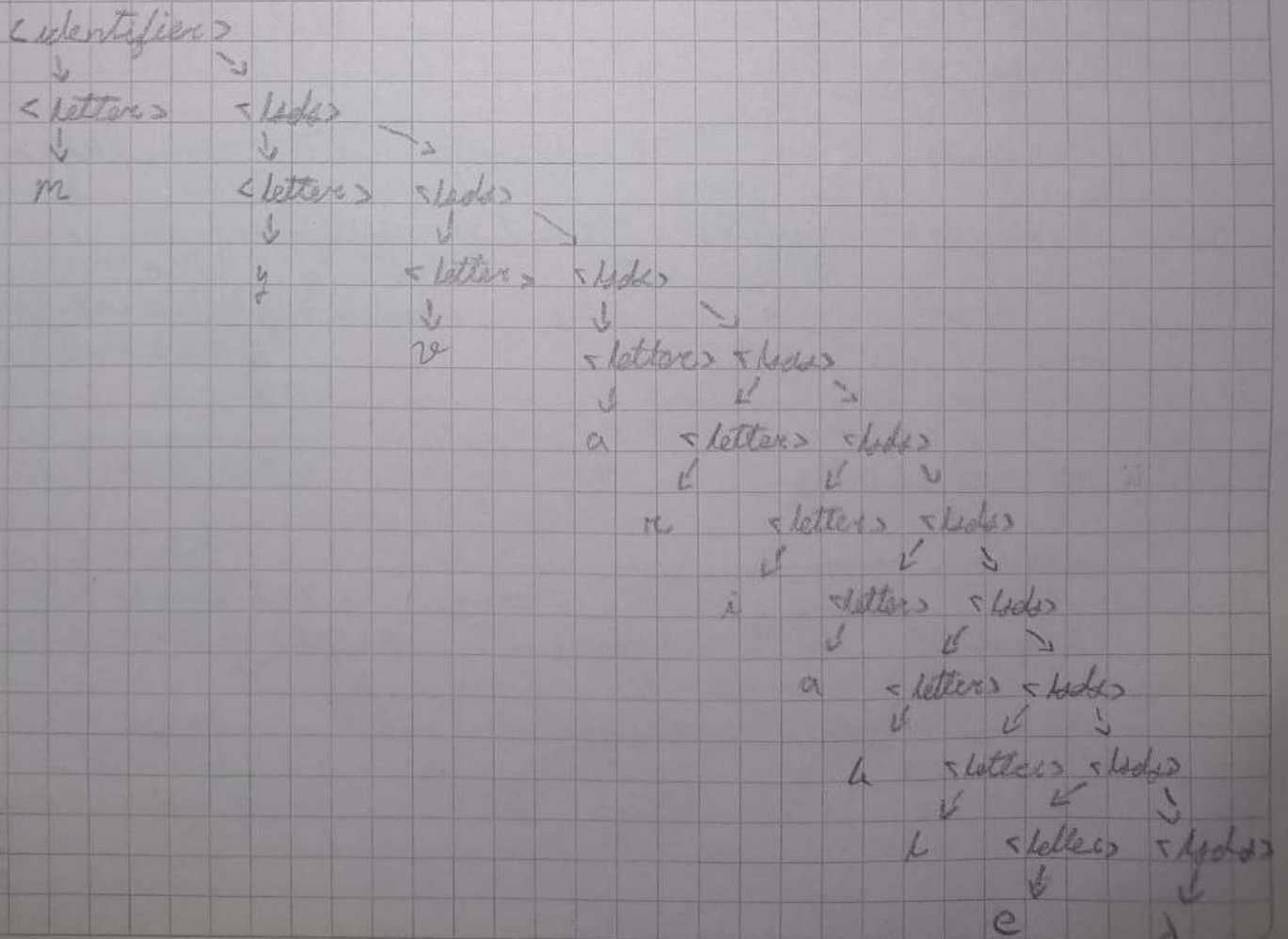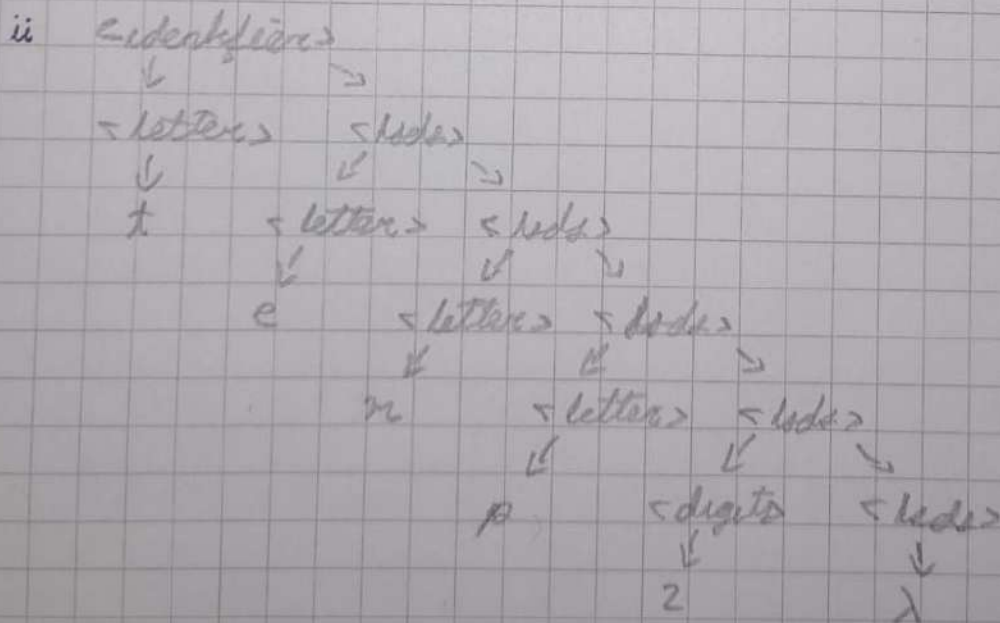
iv The grammar given can't develop the name " 2 Not A variable "