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Course ⇒ NLP
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Course Code ⇒
Branch ⇒ CSE

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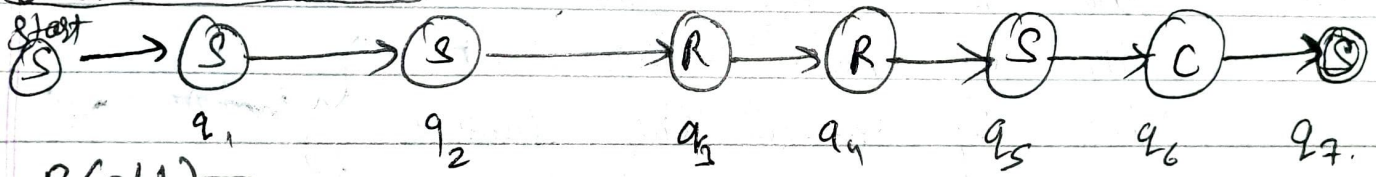
i ↓ \ j →	S	C	R
S	0.8	0.1	0.1
C	0.2	0.6	0.2
R	0.2	0.2	0.4

S = Sunny
R = Rainy
C = Cloudy

Observation be like



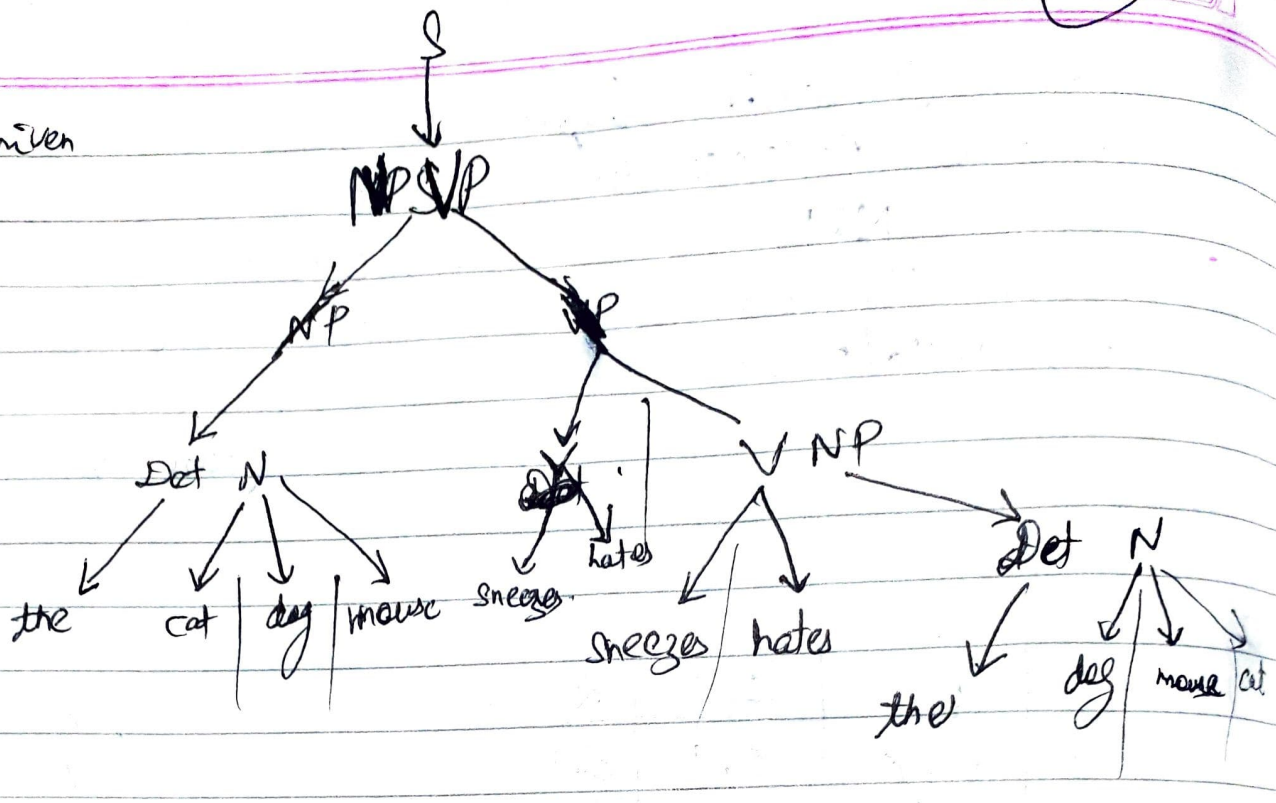
So, Probability of a certain weather
$q_n \in \{S, S, R, R, S, C, S\}$
is based on observations X_i for 7 days. (using bi-grams).

$$P(\quad) = P(q_1)P(q_2|q_1)P(q_3|q_2)P(q_4|q_3)P(q_5|q_4)P(q_6|q_5) \cdot P(q_7|q_6)$$

$$= 0.8 \times 0.8 \times 0.1 \times 0.4 \times 0.3 \times 0.1 \times 0.2$$

$$= 0.0001536$$

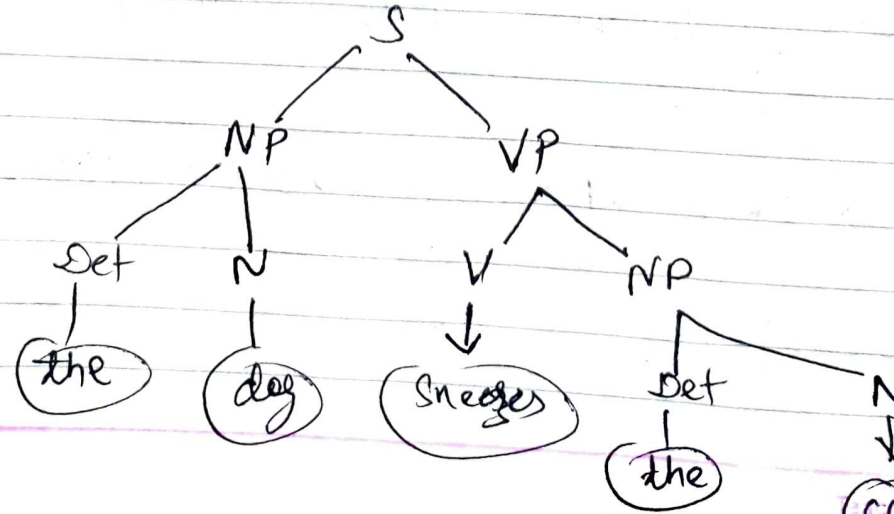
Ans 6) Given



Using given CFG, the following sentences are recognised.

(1) the dog sneezes the cat
(2) the dog hates the cat
(3) the dog sneezes the mouse
(4) the cat sneezes the mouse
(5) the mouse hates
(6) the mouse hates the mouse
(7)

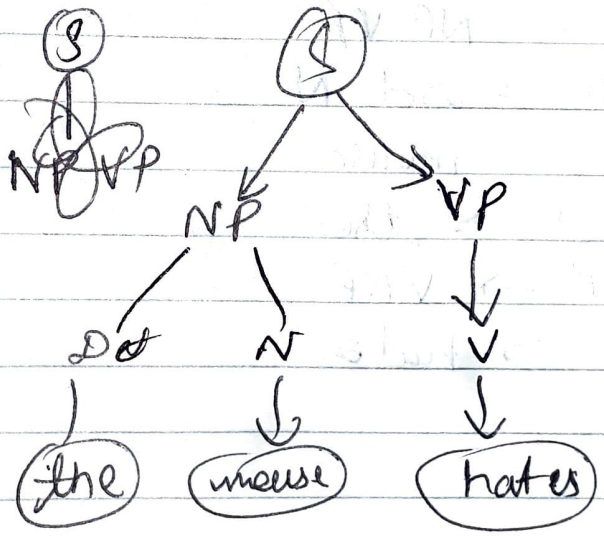
Using Parse Tree for sentence (1)



So; the correct analysis for the sentence ① is

S → NP VP
NP → Det N
Det → the
N → dog
VP → V NP
V → sneezes
~~NP → d~~

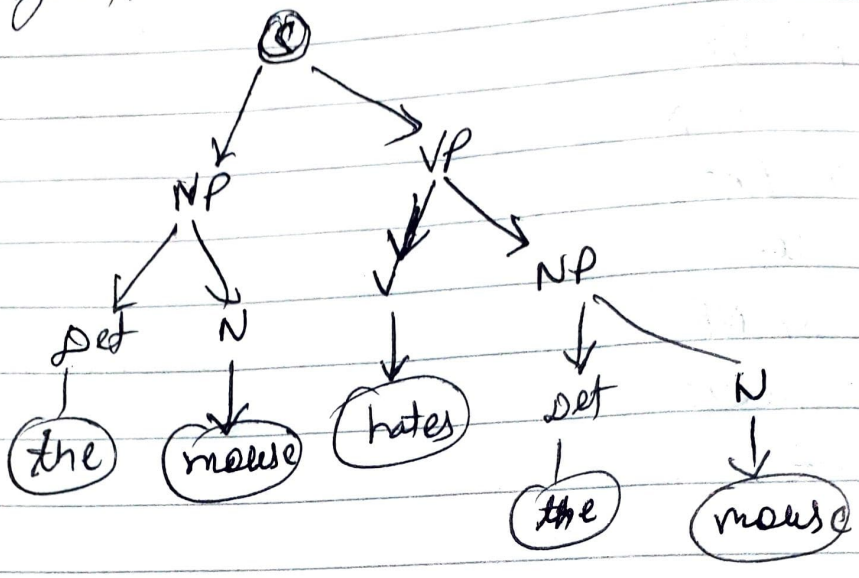
Parsing tree for sentence ⑤ is



So, correct analysis of CFG for sentence ⑤ is

S → NP VP
NP → Det N
Det → the
N → mouse
VP → V
V → hates.

Parsing tree for sentence - (6)



So, CFG for it is :

$S \rightarrow NP\ VP$

$NP \rightarrow Det\ N$

$N \rightarrow$ mouse

$Det \rightarrow$ the

$VP \rightarrow V\ NP$

$V \rightarrow$ hates.