

Q1. Compute the BLEU score for the following candidates.

Reference 1: The teacher arrived late because of the traffic

Reference 2: The teacher was delayed due to traffic

Candidate 1: The professor was delayed due to the congestion

Candidate 2: The teacher was held up by the traffic

Unigram (canal 1)

words	count	Ref 1	Ref 2	$M = \max(\text{Ref 1, Ref 2})$	$\min(\text{count}, M)$
The	2	2	1	2	2
professor	1	0	0	0	0
was	1	0	1	1	1
delayed	1	0	1	1	1
due	1	0	1	1	1
to	1	0	1	1	1
the					
congestion	1	0	0	0	0
8				6	6

Unigram = $6/8 = 3/4$

Bigram (canal 1)

words	count	Ref 1	Ref 2	$M = \max(\text{Ref 1, Ref 2})$	$\min(\text{count}, M)$
The prof.	01	0	0	0	0
prof. was	1	0	0	0	0
was delayed	1	0	1	1	1
delayed due	1	0	1	1	1
due to	1	0	1	1	1
the can the	1	0	0	0	0
the congestion	1	0	0	0	0
7					3

Bigram = $3/7$

Trigram (canal 1) = $2/6 = 1/3$

4 gram (canal 1) = $1/5$

Best reference for cand 1 is Ref2

$$n = 7$$

$$c = 8$$

$$B.P = \text{Brevity Penalty} = 1$$

$$\text{Bleu score} = \left(\prod_{i=1}^n P_i \right)^{1/n} \cdot B.P.$$

$$= \left(\frac{3}{4} \times \frac{2}{7} \times \frac{1}{3} \times \frac{1}{5} \right)^{1/4} \times 1$$

$$= \left(\frac{3}{140} \right)^{1/4} \times 1 = \left(\frac{3}{140} \right)^{1/4} \underline{\underline{\text{Soln}}}$$

Similarly for cand 2 we do the same
Calculations

$$\text{unigram}(\text{cand 2}) = 5/8$$

$$\text{Bigram}(\text{cand 2}) = 3/7$$

$$\text{trigram}(\text{cand 2}) = 1/5$$

$$\text{fourgram}(\text{cand 2}) = 0$$

$$\text{Bleu score} = \left(0 \cdot \frac{1}{6} \cdot \frac{3}{7} \cdot \frac{5}{8} \right)^{1/4} \cdot B.P.$$
$$= 0$$