IST Final Assignment

Solution G.

Word2Vec model – This is a model developed by Google in order to translate human speech and words into numerical values, which can be worked upon by existing Neural network models – to facilitate speech and text processing.

It works the following way –

Given a sentence, we need to split it into multiple overlapping window components like shown in the below example.

Say the window size is 2, we will take each word of the sentence, and to get context of it take 2 words before the target and 2 words after.

This will give us word pairs for every word in the sentence.

The input to the neural network will be the one-hot-encoded version of the target word, and the output will be the encoded version of the context.

The neural network has only one hidden layer, whose size determines the size of the word vectors.

For our dataset, we will pass each pair into the neural network and train it.

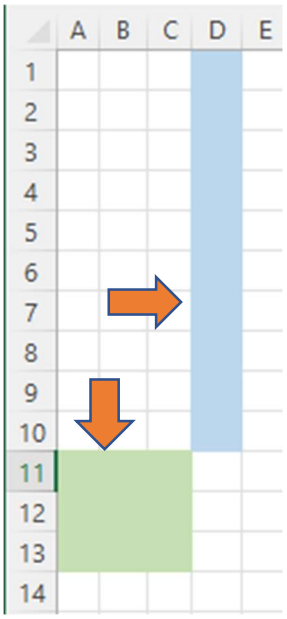
The result – for every input word that we give, the neural network will return all the possible words that have a high meaning gin the current context which will probably appear.

Example Sentence – (for question)

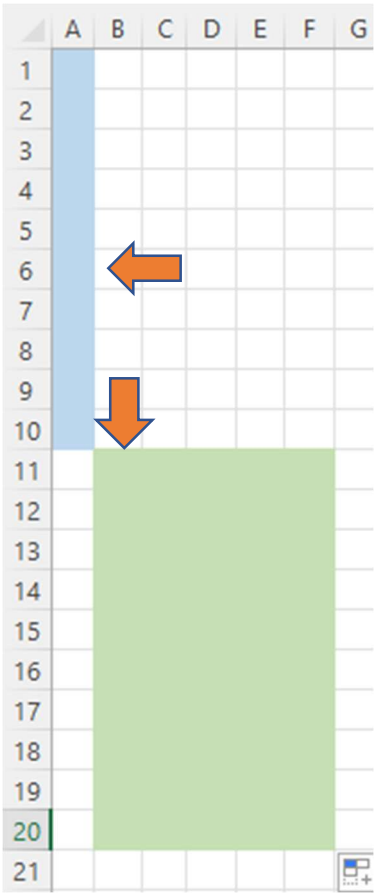
“Shai is a super brilliant and motivated student of Computer Science”

Target	Context
Shai	Is, a
is	Shai, a super
a	Shai, is, super, brilliant
super	Is, a brilliant, and
brilliant	A, super, and, motivated
and	Super, brilliant, motivated, student
Motivated	Brilliant, and, student, of
Student	And, motivated, of, Computer
Of	Motivate, student, Computer, Science
Computer	student, of, science
Science	of, computer

Solution F.

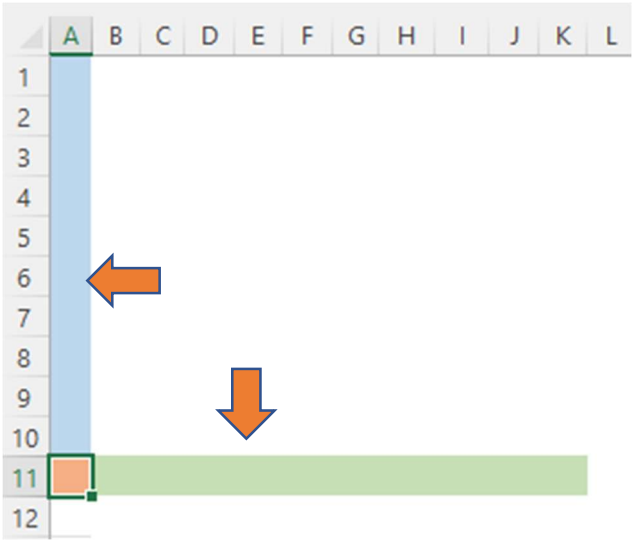


1. A*B1 = (3*3) * (10*1) Matrix => 3! =10 => Not Allowed

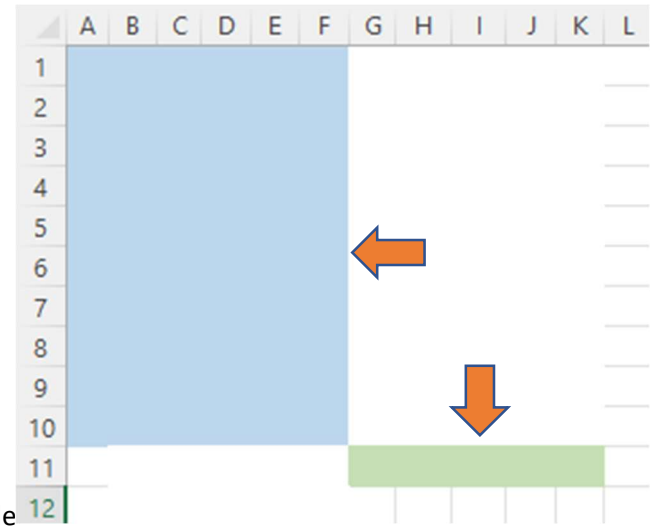


2. B1*W1 = ((10*1) * (10*5) Matrix =>1! =10 => Not Allowed

3. B2*W1 = (1*10) * (10*1) => 10==10 =>Allowed



Result = (1*1) Matrix – Marked in orange

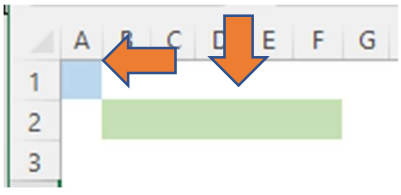


4. B3*W3 = (5*10) * (1*5) => 10 != 1 = Not possible

5. (B2*W1) * W2

From above, (B2 * W1) = gives (10*10) Matrix

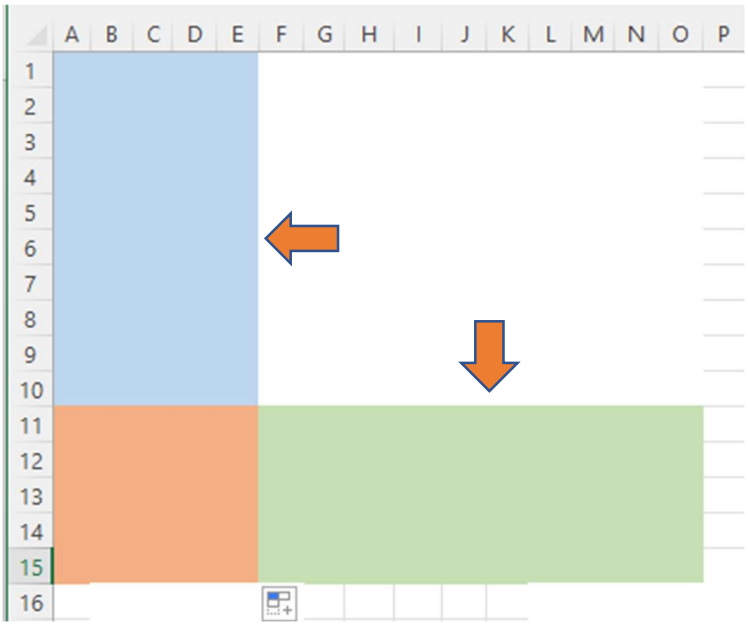
(1*1) * (5*10) => 1 ! = 5 => Not Allowed



6. (B2*W1) * W2

(B3 * W1) = (5*10) * (10*5) => 10==10 => Allowed

gives (5*5) Matrix



Next,

(5*5) * (5*10) => 5 == 5 => Allowed

Gives (5*10) Matrix