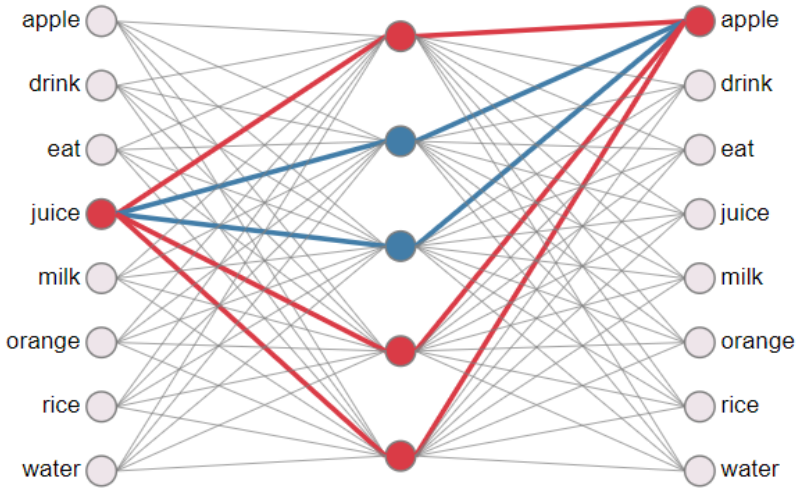
Quiz 2 NLP Roll #:_____

Question: Word to Vector Approach (Skip Gram with Negative Sampling)



We have a training corpus in which we have multiple input words and output as we your task is to define embedding of 'drink' , 'milk' , 'orange' , 'juice' given below weight matrices. Order of vocabulary is define in above architecture. We have obtained these weight matrixes after 500 training samples.

Weight Matrixes:

Input Vector

-1	1	1	-1	-1
1	1	-1	-1	-1
-0.3	0.1	-0.3	0.1	0.1
-1	1	1	-1	-1
-1	-1	1	1	-1
0.1	-1	-1	-1	-1
-1	1	1	-1	-1
-1	1	1	-1	-1

Output Vector

-1	1	1	-1	-1
-1	1	1	-1	-1
0.6	-1	-1	-1	-1
-1	1	1	-1	-1
-1	1	1	-1	-1
-1	1	1	-1	-1
-1	-1	1	1	-1
1	1	-1	-1	-1

Note:

Input Vector is the weight matrix between Input to hidden while Output Vector is the weight matrix between hidden to output.

First define a one hot encoding vector using above architecture and then process for embedding computations.

Tasks:

1. Length of the embedding _____ and how you find it out _____?
2. In case of skip grams embedding vector is just a dot product between

   _____?
3. Can we use analogies on embedding vectors? IF we yes then can we say

milk ➔ drink is same like **orange ➔ juice** ?

Justify your answer by obtaining embedding vectors from above weight matrix. Also define one hot encoding vector.

Solution: