Question 1
Question 2
Question Q
Category 1
Question ···
Category 1
Category 2
Category 3
···

Input layer

Hidden layer

Output layer

Category 1
Category 2

...

Category N

$N*K$

$K*N$

Embedding Matrix

Category 1
Category 2

...

Category N

Word2Vec

Vector of Category i :

$$T_i = (t_1, t_2, ..., t_K), \ for \ i = 1, 2, ..., N$$

Knowledge Spanning of Question Q:

$$KS(Q) = \frac{2!}{n(n-1)} * \Sigma_{Ti \in Q} \Sigma_{Tj \in Q} \ 1 - CS(T_i \ , \ T_j)$$

N: number of Categories
K: dimension of the embedding vector