blog post on convolution

convolution:

$$\overrightarrow{c}_i = (\overrightarrow{a} \circledast \overrightarrow{b})_i = \sum_{j=0}^{d-1} \overrightarrow{a}_{(i-j) \bmod_n} \cdot \overrightarrow{b}_{j \bmod_n}$$

involution:

$$\overrightarrow{a}_i \approx (\overrightarrow{c} \oslash \overrightarrow{b})_i = \sum_{j=0}^{d-1} \overrightarrow{c}_{(i+j) \bmod_n} \cdot \overrightarrow{b}_{j \bmod_n}$$

sentence:

$s = w_1 \ w_2 \ w_3 \ ...$

convolved component:

$\overrightarrow{w}_i \circledast \overrightarrow{pos}_i$

sentence vector:

$$\overrightarrow{s} = \sum_{i=1}^{n} \overrightarrow{w}_i \circledast \overrightarrow{pos}_i$$

for:

$i = 1, 2, 3, 4$

example:

$$\overrightarrow{\text{I like to travel}} = \overrightarrow{\text{I}} \circledast \overrightarrow{pos}_1 + \overrightarrow{\text{like}} \circledast \overrightarrow{pos}_2 + \overrightarrow{\text{to}} \circledast \overrightarrow{pos}_3 + \overrightarrow{\text{travel}} \circledast \overrightarrow{pos}_4$$