# A Quick Summary: ConceptNet 5.5 An Open Multilingual Graph of General Knowledge

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## 1 Ideas:

ConceptNet is a graph that contains various concepts, which can range from nouns (eg. cat, dog, animal) to verbs (run, fly).

(a) The main purpose of ConceptNet is to provide a graph based map of how various concepts are linked with each other. This provides the community with a useful database of relationships that can be used in tasks such as commonsense reasoning or question answering.

## 2 Explanations:

(a) ConceptNet can be thought of as a collection of triplets of the form:

```
(concept1, relation, concept2)
```

This specifies a semi-directed graph with labeled edges (since there are relations that can be symmetric, such as `Synonym`, and relations which are asymmetric, such as `DerivedFrom`.

## 3 Notes:

(a) How do we extract out appropriate subgraphs for a downstream task (through a GCN for example) if we were to do question evaluation?

(b) NLP project: using ConceptNet in answering the CommonsenseQA dataset. To construct the adjacency matrix $A$, we use the following procedure.

i Filter out the top $k$ words (concepts) in the sentence. Label words by $l_j$.

ii Get the set of related concepts for each concept in (i), label as $L_j$.

iii Obtain the set of dot products $D_{ij}$ between the embedding of each word in $L_k$ and that of each answer option $a_i$.

iv Set $\max_{x \in D_{ij}} x$ to be the weight between word $a_i$ and $l_j$ in $A$.

v Repeat steps ii to iv for the weights between the $l_j$'s.

vi Don't have any weights between the answer nodes.