

Semantic Networks– Solution

- 1) Exactly how can a computer determine that the sentence “I keep my money in the bank” refers to a financial institution rather than the land alongside a river. In this context, explain also what spreading activation is.

Answer:

If the semantic network has nodes for both meanings of the word ‘bank,’ they get both activated with an initial weight, along with any other nodes that correspond to concepts from the given sentence. Any active node then activates its neighbors with a lower weight, essentially propagating its activation throughout the network. The activation of a node is the higher, the more highly activated nodes are in close distance to it in the semantic network. The node that corresponds to the ‘financial institution’ meaning of ‘bank’ will thus be more highly activated than the node that corresponds to the ‘land alongside a river’ meaning since it is closer to the node corresponding to ‘money.’

- 2) What are advantages and disadvantages of using semantic networks for knowledge representation over using first-order logic?

Answer:

Advantages:

- Semantic networks are easier to read and understand by humans.
- They are easier to implement and can be more efficient (since they can use special purpose procedures).
- They can be more expressive than first-order logic in some regards (for instance, inheritance with exceptions).

Disadvantages:

- They are less expressive than first-order logic in some regards (for instance, negation and disjunction are problems).
- Their semantics is often not well defined.
- They have problems with multiple inheritance of incompatible properties.

- 3) Draw the semantic network that represents the data given below:

- Mammals have fur.
- All mammals are animals.
- A bird is an animal.
- A cat is a mammal.
- Tom is a cat.

- Tom is owned by John.
- Tom is ginger in colour.

Answer:

