Module:-3

① Three principles that predict when garden paths will arise in syntactic interpretations of sentences:-

i) Minimal attachment:- This principle states that new information should be attached to the simplest syntactic structure possible. For ex, "The old man the boat", the reader is initially likely to attach the word "the" to the noun "man", creating the syntactic structure "The old man the boat", However this structure is not grammatical as the word "the" cannot be used to introduce a verb. The correct structure is "The old man saw the boat".

ii) Late closure:- This principle states that new info should be incorporated into the closure or phrase structure being processed as late as possible. for ex "The horse raced past the barn fell," the reader is initially likely to attach the word "fell" to the verb "raced", creating the syntactic structure "The horse raced past the barn fell", However this structure is not grammatical as the word "fell" cannot be used as an adverb. The correct structure is "The horse raced past the barn, and then it fell".

iii) Recency:- This principle states that info that is encountered more recently is likely to be used in the syntactic analysis of a sentence. For ex "The complex houses married and single soldiers and their families", the reader is initially likely to attach the word "their" to the noun "soldiers", creating the syntactic structure "The complex houses married and single soldiers their families", However this structure is not grammatical, as the word 'their' cannot be used

to refer soldiers. The correct structure is " The complex houses married and single soldiers, and their families live there.

② **Thematic roles associated with**

" John broke the window with the hammer"

→ Semantic Roles or Thematic Roles or θ-Theory :- refers to the way in which the referent of the noun phrase contributes to the stage, action or situation described by the sentence.

(or)

It states that each argument bears one and only one θ-role, and each θ-role is assigned to one and only one argument.

→ Agent – Initiator of an action → In the sentence "John" is the sentence bcs he is the one who performed the action "broke"

→ Theme – the theme is the entity that undergoes the actions or is affected by it. In this sentence, the " window" is the theme because it is the obj that is being broken

→ Instrument :– is the tool or means used to Perform the action. here " hammer" is the instrument because it is what John used to break the window

∴ Agent: John
Theme: the window
Instrument: the hammer

③ B/w the words eat and find which would we expect to be more effective in selection restriction-based sense disambiguation.

→ The verb "eat" can only take nouns that refer to edible things as its objects. So, in the sentence "The dog ate the bone", the noun "bone" can only be interpreted as referring to an edible obj, such as piece of bread etc.

→ The verb "find" has a wider range of selection restrictions. It can take nouns that refer to objects, people, places and even abstract concepts as its object. So, in the sentence "The detective found the clue," the noun "clue" can be interpreted as referring to any object that provides a piece of info about a crime.

∴ eat is more likely to be disambiguated correctly using selection restriction-based sense disambiguation bcs the set of possible obj's for the verb eat is more restricted, which makes it easier to rule out incorrect interpretations.

④ Frame work architecture:-

Text book - 2   Chapter:- 4
                    → 4.4.

⑤ Explain:-
i) Domain knowledge:-

→ Our domain of interes is predictive maintenance in me field of power engineering, more specifically the

maintenance of insulation systems of high-voltage rotating electrical machines.

→ The findings related to the predictive maintenance process are documented in several forms:- the measured values in a relational database; the evaluations of measurements/tests in diagnostic reports written in natural lang.

→ In the domain of predictive maintenance, 2 parties are involved: the service provider (the company that has the know-how to perform diagnostic procedures and recommend predictive maintenance actions) and the customer (the operator of the machine). As part of their business agreement, the service provider submits to the customer an official diagnostic report. Such a report follows a predefined structure template and is written in syntactically correct and parsimonious language.

→ A report is organized into many sections: summary, reason of the inspection, data of the inspected machine, list of performed tests and measurements, evaluations of measurement and test results, overall assessment & recommendations etc. The goal of project is to mine the text documents for relevant pieces of knowledge acquired during diagnostic problem solving situations.

ii) knowledge roles:- are abstract names that refer to the role a domain concepts plays when reasoning about a knowledge task. Such tasks are, for example diagnosis, assessment, monitoring or planning. when describing a diagnosis task, knowledge roles like

finding, symptom, fault, parameter or hypothesis would be used.

1) The calculated <u>insulating resistance</u> values lay in the safe operating area

2) Compared to the last examination, lower values for the <u>insulating resistance</u> were ascertained due to dirtiness at the surface.

→ These 2 sentences are with the same domin concept. (insulating resistance)

Knowledge Role	Text Phrase
Observed obj.	insulating resistance
Symptom:	lower values
Cause:	dirtiness at the surface

knowledge Roles for sentence

→ The knowledge roles used for annotating cases are abstract constructs in knowledge engineering, define independently of any natural lang constructs.

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