



Assignment No:- 1 B

Date:

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Sem / Branch :- VII / I.T

Subject: AI

D.O.P	D.O.A	Marks	Sign

(Q1) Explain PEAS descriptor for WUMPUS world

- i) Performance Measure :-
- i) +100 for grabbing goal & coming back to Start
 - ii) -200 if player is killed
 - iii) -1 Per action
 - iv) -10 for using arrow.

ii) Environment :-

- i) Empty rooms
- ii) Room with WUMPUS
- iii) Rooms neighbouring to WUMPUS which smell
- iv) Rooms with bottomless pits.
- v) Rooms neighbouring with bottomless pits with breezy
- vi) Room with gold which is glinty
- vii) Arrow to shoot WUMPUUS.

iii) Sensor (assuming Robotic agent) :-

- i) Camera to get the view
- ii) odour sensor to smell
- iii) Audio Sensor to Listen to screen beep.



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iv) Erector (Assuming robotic agent)

i) Motor to move left-right.

ii) Robot arm to grab

iii) Robot mechanism to shoot arrow

WUMPUS world agent has following

Characteristics:-

a) Fully observable

b) Deterministic

c) Static

d) Discrete

e) Single agent.

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Q2) Explain Various elements of Cognitive System.

- i) Cognitive Computing is new type of Computing with goal of more accurate models of how human brain/mind sensor, reasons & responds to stimulus.
- ii) Generally, terms Cognitive Computing is used to refer to new hardware and / or software brain thereby improving human decision working Cognitive Computing application like data analysis & adaptive page.
- Following element of Cognitive System

a) Interactive :-

They may interact easily with user so those user can define their needs comfortably. They may also interact with other processor devices or ~~etc~~ cloud services as well as with people.

b) Adaptive :-

They may be engineered to feed on dynamic data's in real time.

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c) Contextual :-

They may understand, identify or extract Contextual element such as meaning, Syntax, location, appropriate domain etc.

d) Interaction OR State:-

They may used in defining a problems by asking question or finding additional source input if problem Statement is incomplete.

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Q.3) write a Note on Language model

→ i) Goal of language model is to Compute probability of token (e.g. sentence or sequence of words) & it is useful in many different MPI application.

i) Language model actually a grammar of a language as it gives probability of words that will follow.

ii) In Case of (1m) Probability of a Sentence or Sequence of words

$$P(w) = P(w_1, w_2, w_3, \dots, w_n)$$

4) It can also be used to find probability of next word in sentence.

$$P(w_{n+1}|w_1, w_2, w_3, w_4)$$

5) A model that Computes either of these is Language model.

Various Language model available are:-

a) Methods using markov assumption:-

A process which is stochastic in nature is said to have markov property if Conditional probability of future State depends upon present state.

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b) N-Gram models:-

from markov assumption
we can formally define model where k:-
1-1 or 3 following:

$$P(w_i | w_1, w_2, \dots, w_{i-1})$$

c) Unigram model ($K=1$):-

$$P(w_1, w_2, \dots, w_n) = \prod P(w_i)$$

d) Bigram model ($K=2$):-

$$P(w_i | w_1, w_2, \dots, w_{i-1}) = P(w_i | w_{i-1})$$

$$P(w_i | w_{i-1}) = \frac{\text{Count}(w_{i-1} \dots w_i)}{\text{Count}(w_{i-1} \dots w)}$$

$$\frac{\text{Count}(w_{i-1} \dots w_i)}{\text{Count}(w_{i-1} \dots w)}$$



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Q.4) Write a Note on Machine Translation?

- i) Machine Translation is classic test of language understand. It consists of both language analysis & generation, many machine Translation System have huge commercial use following are few of egs.
- ii) Google Translate goes through 100 billion words per day.
 - iii) eBay uses machine translation technique to enable cross-border trades. Connect buyers / sellers around globe.
 - iv) Facebook User machine Translation to translate text into ports & language automatically.
 - v) System become 1st Software provider to launch a machine Translation engine in more than 30 language in 2016.
 - vi) Microsoft brings AI Powered translation to end users & developers on Android, iOS & Amazon whether or not they have access to internet.
 - vii) e.g. given source language e.g French & target language e.g English.

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Q5) Explain Following terms :-

=> a) Phonology :-

It is Study of organizing Sounds System officially in an NLP (Natural language Processing) System.

b) Morphology :-

It is Study of Construction of words from primitives meaningful units

c) Lexical Analysis :-

Lexical is words & phrase in Language Lexical Analysis deals with recognition & identification of structure of sentence.

d) Syntactic Analysis :-

In this sentences are based of noun, verbs adjective and other parts of sentences. In this phase grammar of sentence is analyze in order to get relationship among different words in sentences.

e.g:- Mango eat me will be register by analyzer.



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e) Word Sense disambiguation :-

while using words that have more than one meaning we have to select meaning which makes most sense in context.

For e.g:- we are typically given list of words sense eg. from dictionary or from an online resource such as word net.