

K.G.C.E.
Karjat - Raigad

Assignment No-1B

Page No. :

Date :

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Sem / Branch :- VII IIT

Subject :- AI

Dep.

D.O.A

Marks

Sign

Q 1) Explain PEAS descriptor for wumpus world

ii) performance measure.

- +100 for grabbing goal & coming back to start.
- -200 if player is killed
- -1 per action
- -10 for using a move

ii) Environment

- Empty rooms
- Room with wumpus
- Rooms Neighbouring to wumpus which are shells
- Rooms with bottomless pits
- Room neighbouring with bottomless pits which are breezy
- Room with gold which is glitery
- Arrow to shoot wumpus.

iii) Sensor Consuming Robotic agent)

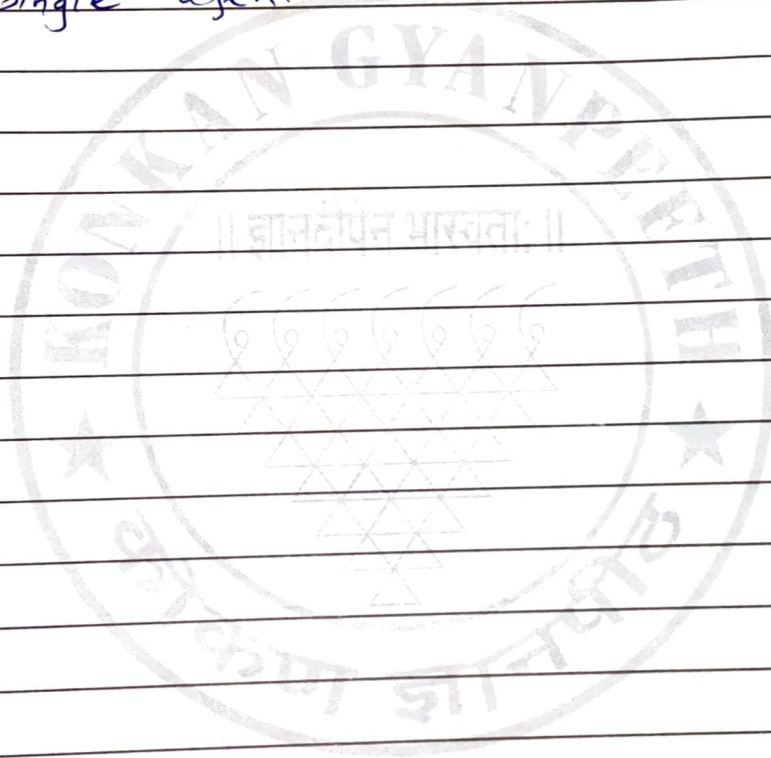
- Camera to get the view
- OVR sensor to show
- Audio sensor to listen to screen bump

iv) Electron (assuming photonic agents)

- motor to move left right.
- Robot on to grab.
- Robot mechanism to shot arrow.

Wumpus world agent has following
character:-

- a) Fully observable
- b) Deterministic
- c) Static
- d) Discrete
- e) Single agent



Q 2) Explain Various elements of Cognitive system

1) Cognitive Computing is New type of Computing with goal of more accurate models of how human brain (mind) sensor, reason & responds to stimulus

2) Generally, term Cognitive Computing is used to refer to new hardware & software that following functioning of human brain thereby improving human decision making. Cognitive Computing applications links data analysis & Adaptive page - Followings are elements of Cognitive System.

a) Interactive :-

- They may interact easily with users so, those users can define their needs comfortably.

b) Adaptive :-

- They may be engineered to Reed on dynamic data in real time. They may learn as information, changes & as goals & requirements involve

c) Contextual :-

- They may understand, identify or extract contextual elements such as meaning, syntax, location, appropriate domain etc.

[illegible]

Q 3) Write a Note on Language Model.

- 1) Goal of language model is to compute probability of token (e.g. sentence or sequence of words) are useful in many different NLP applications.
- 2) language model actually a grammar of language as it gives probability of word that will follow.

3) In case of (LM) probability of a sentence as sequence of word is

$$p(\omega) = p(\omega_1, \omega_2, \omega_3, \dots, \omega_n)$$

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

$$C_p(\mu S(\omega_1, \omega_2, \omega_3, \omega_4))$$

5) A model that computes either of these is language model.

Q. 3) There are various language models available a few are:-

a) methods using markout assumption:-

- A process which is stochastic in nature is said to have Markov property if Conditional Probability of future states depends upon present states

b) N - Grams models :-

- from market assumption we can formally define models where $k: A \rightarrow B$ as following

$$\rho(\omega_1, \omega_2, \dots, \omega_i - 1)$$

c) original model $(k-1)$:-

$$P(\omega_1, \omega_2, \dots, \omega_r) \equiv P(\omega_i)$$

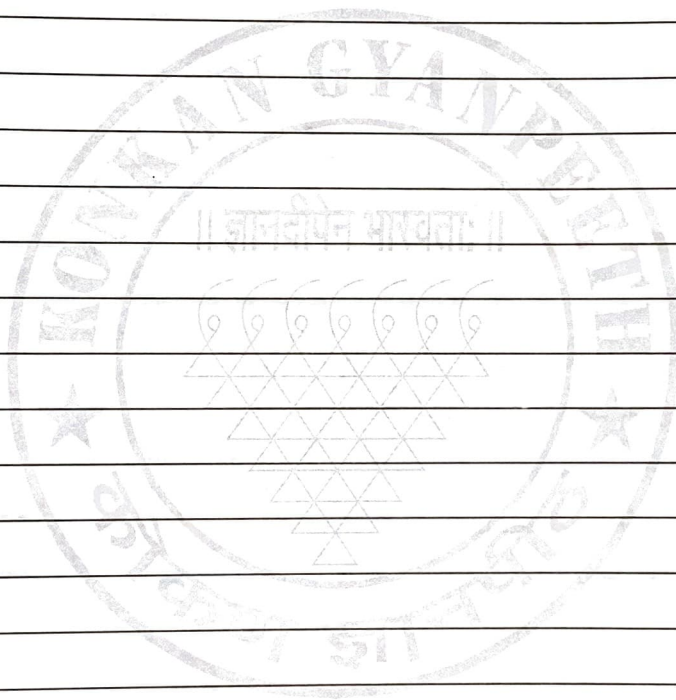
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d) Bigrams Model ($k=2$): -

$$p(\omega_1 / \omega_1, \omega_2 \dots \omega_n) = P(\omega_i / \omega_{i-1})$$

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

$$\cos nL (\omega_i - \omega)$$



Q 4) Write a note on machine Translation!

→ 1) Machine Translation is classic test of language understand. It consist of both language analysis & generation. many machine translation systems have huge commercial use following are few eg.

- Google Translate goes through 100 billion words per day

- eBay uses machine translation techniques to enable cross-border trade & connect buyers/sellers around globe.

→ Facebook User machine Translation to translate text into points & Comment automatically in order to break language barrier

- Sysstar became 1st software provider to launch a machine translation engine in more than 80 languages in 2016.

→ Microsoft brings AI-powered translation to end user & developers on Android, iOS and ~~OS~~ Amazon whether or not they have access to internet.

- In traditional machine translation system, parallel collection of trees is used to each of which is translate into one or more other language than original.

e.g. given source language e.g. French
language e.g. English.

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Q 5) Explain Following terms:

a) Phonology:-

- It is study of organizing sounds systematically in an NLP (Natural language processing) system.

b) Morphology:-

- It is study of construction of words from primitive meaningful units.

c) Lexical Analysis:-

- Lexical is words & phase in language. Lexical Analysis deals with recognition & identification of structure of sentences. It provides programs in sentence phase.

d) 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 e.g. From Dictionary or focus on Online Resource such as word net.

e) Systematic Analysis:-

- In this sentence are parsed as Noun, Verb's objective & other parts of sentences. In this phase grammar of sentence is analyze in order to get relationship among different words.