

Name :- Aishwarya Y. Charan

Roll No :- 11

Class :- BE

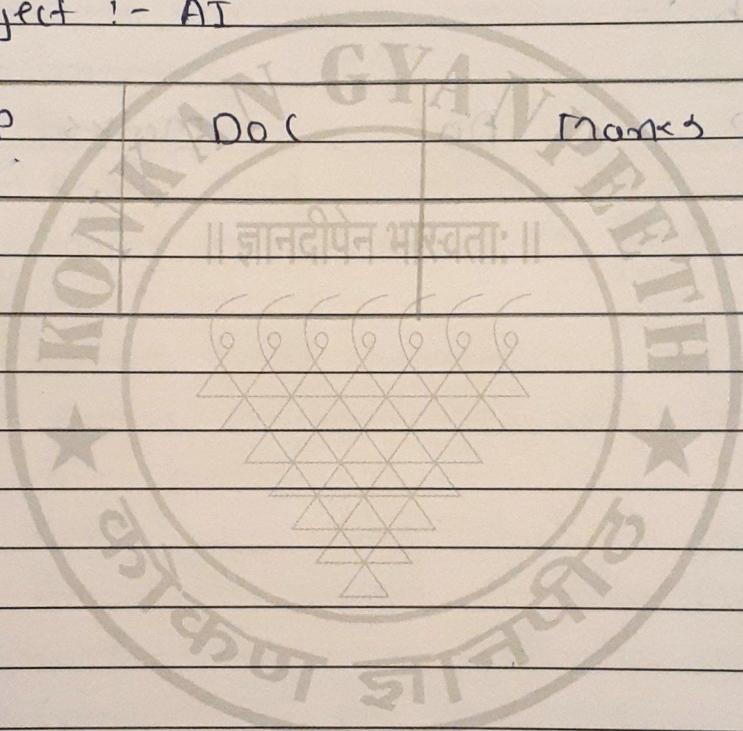
Subject :- AT

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Q] Explain PFA's descriptive descriptors for WUMPUS world

→ i] Performance measure

- +100 for grabbing the goal and coming back to start

- -200 if the player is killed

- -1 per action

- -10 for using arrow

ii] Environment

- Empty Rooms

- Room with WUMPUS

- Rooms neighbouring to WUMPUS which are smelly.

- Rooms with bottomless pits.

- Rooms neighbouring with bottomless pits which are breezy

- Room with gold which is glinty

- Arrow to shoot the WUMPUS

iii] Sensors (assuming a robotic agent)

- Camera to get the view

- Odour sensor to smell the stench.

- Audio sensor to listen to the screen and bump.

iv] Effectors (assuming a robotic agent)

- Motor to move left Right

- Robot arm to grab the gold.

- Robot mechanism to shoot the arrow.

The WUMPUS world agent has following characters:-

- q] Fully observable
- b] Deterministic
- j] static
- d] Discrete
- e] single Agent

Q) Explain various element of cognitive system
→ cognitive computing is a new type of computing with the goal of more accurate models of how the human brain / mind senses, reasons and responds and responds to stimulus. Generally the term cognitive computing is used to refer to new hardware and / or software that mimic the following functioning of the human brain thereby improving human decision making cognitive computing application links data analysis and adaptive page i.e Adaptive user interface , to adjust content for a particular type of audience.

- Following are element of cognitive system

a] Interactive :- They may interact easily with user so that those user can define their needs comfortably . They may also interact with other processors, devices and cloud service as well as with other people.

b] Adaptive :- They may be engineered to feed on dynamic data in real time, they may learn as information changes and as goals and requirement evolve. They may resolve ambiguity and tolerate unpredictability behaviour.

c] Contextual :- They may understand, identify and extract contextual elements such as meaning syntax location appropriate domain etc.

d] Iterative and stateful :- They may used in defining a problem by asking question or finding additional source input if a Problem statement is incomplete.

Q3

Write note on language model

- - The goal of a language model is to compute a probability of a token and are useful in many different NLP Applications
 - Language model actually a grammar of a language as it gives the probability of word that will follow.
 - In case of (LM) the probability of a sentence as sequence of words is $P(w) = P(w_1, w_2, w_3, \dots, w_n)$
 - It can also be used to find the probability of the next word in sentence : $P(w_5 | w_1, w_2, w_3, w_4)$
 - A model that compute either of these is language model
 - There are various language model available a few are :-

a] methods using markov assumption:-

A process which is stochastic in nature is said to have markov property, if the conditional probability of future states depends upon present state.

b] n-gram models.

From the markov assumption, we can formally define models where $k = n-1$ as Following :-

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

c] unigram model ($k=1$):-

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

d] Bigram Model ($k=2$):-

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

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

e] Write a note machine Translation:-

→ - Machine Translation is classic test of language understand it consist of both language analysis and generation. many machine translation system have huge commercial use. Following are few of the example:-

i] Google Translate goes through 100 billion words per day.

ii] eBay uses machine translation techniques to enable cross-border trade and connect buyers (sellers around globe).

iii] Facebook uses to translate text in post and comments automatically in order to break language barriers.

iv] Microsoft brings AI-powered translation to end users and developers on Android, iOS and Amazon fire. whether or not they have access to the Internet.

- In a traditional machine translation system, parallel corpus a collection of texts is used to each of width is translated into one or more other languages than the original. For ex. given the source language. e.g. french

and the target language eg. English ,multiple statical models needs to be build ,including a probability formulation using the Rules, a translation model $p(f|e)$ trained on parallel corpus and a language model $p(e)$ trained on the english corpus

- It is obvious that this approach skips ~~hundreds~~ hundreds of important details , requires a lot of human feature engineering and is overall a complex system.

5] Explain the following terms:-

→ a) Phonology :-

- It is the study of organizing sounds systematically in an NLP system.

b) Morphology :-

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

c) Lexical Analysis :-

- lexicon is words and phrases in language . lexical analysis deals with the recognition and identification of structure of sentences . It divides the paragraphs in sentences , ~~phrases~~ phrases and words.

d) Syntactic Analysis :-

- In this sentences are parsed as noun verb , adjective and other parts of sentences . In this phase the grammar of the sentence is analyzed in order to get relationship

among different words in sentences. for ex.
"Mango eats me" will be rejected by analyzer.

e) word sense disambiguation :-

- while using words that have more than one meaning we have to select the meaning which makes the most sense in context. for example we are typically given a list of words associated word senses (eg from a dictionary or from an online resource such as word net).