Assignment No: 1B

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* Subject :- AI

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Q1 Explain PEAS 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 the arrow

ii> Environment
- Empty rooms
- Rooms with WUMPUS
- Room neighbouring to WUMPUS which are Smelly
- Rooms with bottomless pits.
- Rooms neighbouring with bottomless pits which are breezy
- Rooms with gold which is glitery
- Arrows to shoot the WUMPUS

iii> Sensors (assuming a robotic agent)
- Camera to get the view
- odour sensor to smell the trash
- Audio sensor to listen the screen & bump

iv> Effectors (assuming a robote agent)
- Motor to move left right
- Robot arm to grab the gold
- Robot Mechanism to shoot the arrow.

- The WUMPUS world agent has following Characteristics
a> full observable b> Determinites c> Episodic
d> State e> Discrete f> Single agent

Q2 Explain Various Elements 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, reason & respond to stimulus Generally. The term Cognitive computing is used to refer to new hardware and for software the 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 elements of Cognitive System

a) Interactive :- They may interact easily with users so that these users can define their needs comfortably - they may also interact with other processors, devices and cloud services.

b) Adaptive :- They maybe engineered to feed on dynamic data in realtime they may learn as information changes & goas and requirement evolve. they may resolve ambiguity & tolerate unpredictability behaviours.

c) Contextual :- They may be underrated, identify and extract contextual, elements such as meaning Syntax location, appropriate domain etc.

d) Inventive and Stateful :- They may used in defining a problem by asking questions 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 probablity of a token eg, a sentence or a sequence of words & are useful in many different NPL applications.

- language Mode (LM actually a grammer of a language as it gives the probablity of word that will follow.
- In case of the probablity of a sentence as a sequence of words its - $P(W)P(W_1, W_2, W_3)$
- A mode that computs either of these is long language model.
- There are various language Model available :-

a) Methods using Markov assumption :-

- A process which is Stochate in nature. is said to be have the marker property if the conditional probablity of ~~but~~ future state depends upon present state.

b) N-gram Models:-
- from the Markov Assumption. We can formally define Models where K=n-1 as following.
$P(w_i | w_1 w_2 \ldots w_{i-1})$

c) Unigram model (K=1) :-
$P(w_1 w_2 \ldots w_n) = \prod_i P(w_i)$

Q4 Write a note on Machine Translation
⇒ Machine Translation is classis test of language understand It consist of both language analysis and generations many machine translation system have huge commercial use following are few of the example:-
- Google translate goes through 100 billion words per day.
- Ebay users machine translation techniques to enable cross border trade and connects buyers/sellers around globe.
- Facebook Users (MT) to translate text in posts comments automatically in order to breake language barriers.
- Microsoft brings AI-powered translation to end users and developers on android, iOS an Amazon fire Whether or not they have access to Internet.

- In a traditional Machine Translation System parallel corpus a collection of text is used to each of width is translated into one or more language than the original for example given the source language. eg French and targated language eg English, multiple Statistical module needs to be build including a probabilistic formulation using the Regesion Rule.
- It is obvious that, this approach skips hundreds of important details, required a lot of human Realtime engineering, and is overall a complex System.

Q5 Explain the following Terms:-

a) Phonology :-
- It is the study of organizing sounds systematically in an NLP (natural Language Processing) System.

b) Morphology :-
- It is a study of construction of words from primitive meaningful units.

c) Lexical Analysis :-
- Lexilon is the words and phrases in language lexical analysis deals with the recognition and identification of structure of sentences Intures the paragraph in sentences & words.

d7 – Syntatic Analysis :-
In Syntatic Analysis the sentences are passed is noun, Verbs, adjectives & other parts of sentences. In this phase, the grammer of the sentence is analyzed in order to get relationship among different words in sentence for ex:- Mango eat me? will be rejected by analyzer.

e7 – Word Sense disambigiation
While using words that have more than one meaning we have to select the meaning which makes the most sense in context for eg, We are typically given a list of words associated word sense eg. from a dictionary or from an online resource such as wordnet.