K.G.C.E.
Karjat - Raigad

Assignment - 1B (AI)

Page No. :
Date :

KGCEKGCEKGCEKGCEKGCEKGCEKGCEKGCEKGCEKGCEKGCEKGCEKGCEKGCEKGCEKGCEKGCEKGCEKGCEKGCEKGCEKGCEKGCEKGCEKGCEKGCEKGCEKGCEKGCEKGCEKGCEKGCE

Name - Poonam Sunil Patil.

Class - BE.IT

Roll No - 46

Subject - Artificial Intelligence.

Branch - Information Technology.

K.G.C.E.
Karjat - Raigad

Assignment-01

Page No. :
Date :

Q.1) Explain PEAS des.

i) Performance measure:
- +100 for grabbing the goal and coming back to start
- -200 if the player is killed.
- -1 for using arrows.

ii) Environment:
- Empty rooms
- Room with WVMPS
- Rooms neighbouring to WVMPS which are Smelly.
- Rooms with bottomless pits.
- Rooms with gold which is glitery.

iii) Sensors Consuming a robotic agents.
- Camera to get views.
- Odour Sensor to mess the search.
- audio Sensor to listen to the scream & bump.

iv)
- motors to move left & right.
- Robot arm to grab gold.
- Robot mechanism to shoot the arrows.

The WVMPS world agent has following characteristics:

a) ~~Fussy~~ Fully observable b) Deterministics
c) Episodic d) Static e) Discrete
f) Single agent.

Q.2) Explain the various elements of Cognitive System.

Cognitive Computing is a new type of Computing with the ~~good~~ goal of more accurate models of how the human brain/mind senses, reasons and responds to stimulls. Generally the term Cognitive is used to refer to new h/w and/or s/w that mimic the following functioning of the human brain thereby improving human decision making Cognitive Computing applications links data analysis and adaptive page digital i.e adaptive user interfaces to adjust Content for a particular type of audience.

- following are the elements of cognitive System:-

i) Interactive - They may interact easily with users so that these users can define their needs comfortably.

ii) Adaptive - They may be engineered to feed on dynamic data in real time. They may learn as information changes and as goals & requirements envolve.

iii) Contextual - They may understand, identify & extract contextual elements such as meaning Syntax, location, appropriate domain, etc.

iv) Interactive & Stateful - They may be in defining a problem by asking questions Source i/p If problem Statⁿ is incomplete.

Q. 3) Write short note on language model:

- The goal of language model is to compute a probability of a token that is sentence or words and are useful in many different NPL applications.
- In case of (LM) the probability of a sentence as sequence of words is $P(w) = P(w_1, w_2, w_3 \ldots P w_n)$
- It can also be used to find the probability of the next word in Sentence : $P(w_5 | w_1, w_2, w_3 \ldots w_4)$
- A model is that computes either of these is language model.

a) Methods using markov Consumption:
- a process which is stochastic in nature is said to have the 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 :-
$P(w_i | w_i \cdot w_2 \cdots w_i - 1)$

c) Unigram model (k=1) -
$P(w_1 w_2 \cdots w_n) = \prod_i P(w_i)$

d) Bigram model (k=2) -
$P(w_1 | w_1, w_2 \cdots w_{i-i}) = P w_i | w_{i-1})$

$$(w_1 | w_{i-1}) = \frac{\text{count}(w_{i-1} \cdots w)}{\text{count}(w_{i-1})}$$

Q.4) write short note on Machine Translation:

- machine translation is classic test of langn understand. It consist of both language analysis and generation. many machine translation system have huge commercial use. ex :-
  - Google Translate goes through 100 billion words per day.
  - ebay uses machine translation techniques to enable cross-border trade and connect buyers / sellers around globe.
  - facebook uses to translate text in post & Comments automatically in order to break language barriers.
  - In traditional machine translation system, parallel Corpus a collection of text is used to each width, is translated into one or more other language. eg: French & the target langn eg. English, multiple statistical models needs to be build, including a probalation model p(f)e trained on the english corpus.
  - It is obvious that this approach skips hundereds of important details, require a lot of human realtime engineering & is overall a Complex system.

Q.5) Explain following terms:

a) Phonology :-
- It is a study of organizing sounds systematically in an NLP natural language processing system.

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

c) word Sense disambigution:
- 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.