1. INTRODUCTION

A.I (Artificial Intelligence) :- A.I is a branch of Computer Science which is used to create Systems (programs) That Learn and Think Independently.

(i) A Structure of The A.I program follows The (Knowledge) Two Kinds of Approaches They are:

a) Bottom-up approaches
b) Top-down approaches.

a) Bottom-up approaches :-

*) In This approche we create intilligent machines by Building Replicals of Human brain which is a complex Network of Neurons.

b) Top-down approches :-

*) In This approaches we create Intelligent Systems That Mimic The Behaviours of the Human Brain with Computer programes

The Various Sib fields of AI are:

1] Machine Learning
2] Neural Networks
3] Expert Systems
4] Speech recognization System
5] Image processing
6] NLP, 7] Robotics

2. BRIEF HISTORY

1) In 1956, John Mc Carthy organized a Conference on Machine Intelligence, where the Name Artificial Intelligence (A.I) was Evolved.

2] In 1957, Gps (General problem Solver) was developed and Tested By 'SIMON' which is Capable of Solving the probelems relateted to common Sense.

3] In 1958, John Mc Carthy developed a programming Largage for A.I programes. which is called LISP - (List-processing language)

*] LISP is used to Solve probelems logically and Spatially. which are related to specific domain

4] In 1960, A programe called 'STUDENT' was developed which is used to Solve Algebra probelem and Fuzzy Set probelem

of 5th unit Fuzzy set

5] In 1970, Minisky developed an A.I programe for storing Structred knowledge.

6] In 1970, PROLOG (programming In Logic) was developed to predict the probability under uncertain Conditions.

7] In 1985, Vision Based Systems were Evelveed:

3. INTELLIGENT SYSTEMS

1) A System is said to be intelligent if it has ability to pass the Turing test.

2) The very first intelligent Systems was developed 1966. By Joseph weizen baum, which was named 'ELIZA'.

3) ELIZA passed the turing test which made Conversation with the user in English.

4) This programe has the ability to do Conversation on any subject Since it has the Concerned Subjects Infomation in the databank or) data set

5) 'ELIZA' programe Can also pickup dibberent speech patterns from the user questions and provides responeses using Those patterns.

6) The 'ELIZA' programe Conversation is indicated by '>' and user conservation is indicated by '*'

Example Conversation :-

> Hello. I am ELIZA
* Can you help me?
> Don't you believe. That I can help you.
* yes
> I See.
* I feel depressed.
> How long have you been feeling depressed?
* Since Last month.

* Characstics of ELIZA

The main characstics of the ELIZA programe are.

1) Simulation of Intelligence :- The ELIZA programe Simulates intelligent behaviour quite effectively by recognizing keywords and pharases

2) Quality of response :- The ELIZA programe is Sophisticated in such away it can procais the input text at a Syntactical level.

3) Coherence :- Each statement was based entirely on current input but not the context

4) Semantics :- The ELIZA programe no semantic representation of the content for the user input & reply.

* Categorizes of Intelligence Systems :- There are four categorizes of intelligence System, They are;

1) System That Thinks like humans.
2) System that acts like human.
3) System That Think rationally.
4) System That acts rationally.

1) System that think like humans :-

These Systems requires cognitive modeling approaches. which is based on black box Thought process.

2) System that Acts like human :-

These Systems require overall behaviour of the System which behaves like human, which is achived by observation.

3) System That think rationally :-

These Systems depends more on logical abilities.

4) System that Acts Rationaly :-

These System perform rational behaviour even Thought The method which is used is not logical.

*) Components of A.I programe :-

The A.I programe should have. The Three components mentioned below., They are :

1) Knowledge base :- Here the AI programe should be able. to update the knowledge naturally which consists of facts and rules.

Control Strategy:- It determines which rules is applied and it is implemented by using heuristics.

Inference Mechanism:- It requires knowledge based and derives new knowledge from the existing knowledge with help of inference rules.

4. FOUNDATIONS OF A.I

The Basic foundations of A.I are:

1) Mathematics.
2) Neuro science.
3) Control theory.
4) Linguistics

1) Mathematics :- The A.I systems use logical methods and boolean logic for computation and also use probability theory

2) Neuro science :- It helps in the study of the function of brain. To develope a mechanical, A System will require parael computation, remapping and inter-connection to large extent.

3) Control theory :- Here the System should be able to modify it's behaviour in response to the environment.

4) Linguistics :- Languages and Thoughts play an Important role in Linguistics. Speech demonstrates and replicates human intelligance.

5. APPLICATION OF A:I

The various applications that can be developed using A:I are :

1. Engneering (design).
2. Business application (financial Stratigies)
3. Manufacturing (Assemble, Inspection, maintence)
4. Medicine (monitoring, daigonsis).
5. Education (Learning, Learning Management (LMS) System)
6. Fraud detection (cyber)
7. Aero Space.
8. Information retrival (google, Search)
9. object Identification System.

6. Tic-Tac-Toe [Game playing]

1) A Tic-Tac-Toe is a game, can be Two players game. where one player marks with bigo 'o' and other player marks with 'x' at their turns in the spaces of a 3x3 grid.

2) The player who places three consecutive marks in any horizontal & vertical, daigonal, rows will win the game.

3) Here we consider one player as human (H) and the other player is computer programe (C).

Approach :-

(i) Here we choose the ward position to be a magic squre of order 3, which is Evolvated by using the formula.

$$n[(n^2+1)]/2$$

(ii) Since the magic squre of order three, we get n^2 district value, hence we get,

3^2 district values they are: (1, 2, 3, 4, 5, 6, 7, 8, 9)

(iii) By substuting the formula the Elder value of 3+1 above formula: $= n[(n^2+1)]/2$

$= 3[(3^2+1)]/2$

$= 3[(9+1)]/2$

$= 3[5]$

$= 15.$

(v) Hence the magic Square of order 3 is represented in a Table given below.

8	1	6
3	5	7
4	9	2

Here Every block is identified by a number,

They are : (8, 1, 6, 3, 5, 7, 4, 9, 2)

Algorithm:-

(i) Start

(ii) Consider the blocks of each player

(iii) Calculate the difference (D) between 15 and the sum of two blocks of the players

(a) If $D \neq 0$ & $D \neq 9$, Then these two blocks are not collinear, else the player can make a move a block.

(b) This Strategy will produce a possible win for a player.

Explanation :-

8	1	6
3	5	7
4	9	2

{ H, C }

- Turn 1: Suppose H plays in the eighth block
- Turn 2 : C plays in fifth block (fixed move, see from Table 1.3
- Turn 3 : H plays in first block.
- Turn 4. : C checks if H can win or not
  - Compute Sum of blocks played by H
    - S = 8+1 = 9
    - Compute D = 15-9=6.
  - The sixth block is a winning block for H and not There on either list. So, C blocks it and plays in sixth block. The sixth block is recorded in The list of Computer.
- Turn 5 : H plays in fourth block.
- Turn 6 : C checks if C can win as follows:
  - Compute Sum of blocks played by C.
    - S = 5+6 = 11
    - Compute D = 15-11 = 4; Discard this block as it already exits in X list .

- Now C checks whether H can win
  - Compute Sum of pairs of Square from list of H which have not been used earlier
    - S = 8+4 = 12
    - Compute D = 15 - 12 = 3
- Block 3 is free, So C plays in This block. The Third block is recorded in The list of computer

7: If H plays in Second 8 ninth block, Then Computer wins. Let us assume That H plays in Second block

m 8: C checks if it can win as follows.
- Compute Sum of blocks played by C which has not been used earlier.
  - S = 5+3 = 8;
  - Compute D = 15 - 8 = 7
- Block 7 is free, So C plays in Seventh block and wins The game.
- If H plays in Seventh block at its Turn 7, Then There is a draw.

7. DEVELOPMENT OF A.I. LANGUAGES.

- A.I Languages mostly stress on knowledge representation schemes, matching pattern etc.

The various A.I based programming Languages are,

LISP (List processing)
prolog (programming in logic)
pop (procedure oriented programing)

LISP is a functional Languages which is based on calculus

PROLOG is a logic language which is based on first order predicate logic.

pop is a stack based Language which is similar to LISP. pop-log is an environment which the use of both logic and functional Languages.

Hybrid programming Langiges focus more on domain rather than implementation. Eg: KLONE

A.I programe can also be developed by using the traditional programing Languages like C, Java, Python, etc...

8. CURRENT TRENDS IN A.I

In A.I the computation can be Conventional & non Conventional for a programe.

Conventional Computing :-

A Conventional Computing is based on The Concept of precise modelling and analyzing to get accurate results.

A Conventional Computing can also called as Hard Computing.

It is also bound by NP- complete set which relates to areas like, biology, medicine, humanities, ...etc. and to Solve problem in ~~which~~ Such areas is difficult and also takes more time to process.

Non Conventional Computing :-

The Non Conventional Computing can also be Ccalled as Soft Computing, where the techniques of Soft computing resemble biological process.

The various Components of Soft Computing are.,

1. Neural Networks.
2. Fuzzy Systems
3. Evolutionary Algorithms
4. Swam Intelligence.. etc.

Neural Networks are based on functioning on human Brain, which leads to artificial Neural Networks.

Fuzzy sets(or) Systems / logic is a method which is used to resemble human reasoning.

Evolutionary Algorithm are optimization Algorithms which are used to identify global optimal solution.

Eg:- Genetic Algorithm (used for search probelems)

Swarm Intellengence is based on collaitive behaviour of decentoralized and self organized systems.

Eg:- Ant colony Algorithm (used for soling combinational optimization probelems).