**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*Experiment No: 1**

***Task to be performed:***

* **Construct Knowledge Bases and Queries posed to the** [**Sample KB’s**](http://www.learnprolognow.org/lpnpage.php?pagetype=html&pageid=lpn-htmlse1) **using PROLOG**
* **Construct a Knowledge Base (KB) of Family Tree and pose queries to the KB using AI Programming Language - PROLOG**

***Instructions:***

Write theory for the following topics

* **What is Prolog?**
* **Syntax and Basic Fields**
* **Key Features -** 
  + *Some unification, some data types, and some built-in predicates*
  + *The structured object data type and storing and retrieving facts*
  + *Representing information, search strategies, and simple rules*
  + *Backtracking and recursion*
  + *Lists and list processing*
  + *Output and program design*
* **Advantages & Disadvantages**
* **Applications**

***Outcome:***

1. **Knowledge Bases and Queries posed to the** [**Sample KB’s**](http://www.learnprolognow.org/lpnpage.php?pagetype=html&pageid=lpn-htmlse1) **constructed using PROLOG**
2. **Knowledge Base and Queries posed to the Family Tree constructed using PROLOG**

**Whatever family tree you had created**

1. **Draw it,**
2. **Prolog statements for the creation of trees with explanation**
3. **Explain the queries you wrote.**

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**Experiment No: 2**

***Task to be performed:***

* **Construct knowledge representation and create a knowledge base for the chosen Problem Statement using PROLOG (Tower of Hanoi)**

***Instructions:***

Write theory for the following topics

* **What is a Logical Agent?**
* **Explain the role of Knowledge Base in a Logical Agent.**
* [**Prolog - Operators**](https://www.tutorialspoint.com/prolog/prolog_operators.htm)
* [**Loop & Decision Making**](https://www.tutorialspoint.com/prolog/prolog_loop_and_decision_making.htm)
* [**Conjunctions & Disjunctions**](https://www.tutorialspoint.com/prolog/prolog_conjunctions_and_disjunctions.htm)
* [**Prolog - Different and Not**](https://www.tutorialspoint.com/prolog/prolog_different_and_not.htm)
* [**Prolog - Inputs and Outputs**](https://www.tutorialspoint.com/prolog/prolog_inputs_and_outputs.htm)
* [**Prolog - Built-In Predicates**](https://www.tutorialspoint.com/prolog/prolog_built_in_predicates.htm)

**Explain Tower of Hanoi problem**

***Outcome:***

* **Tower of Hanoi problem prolog program and output** (**With explanation)**

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*Experiment No : 3**

***Task to be performed:***

* **Select a problem statement relevant to AI.   
  Recognize the PEAS descriptor, and identify properties of the task environment   
  and type of agent for the selected problem.**
* **Refer to Fuzzy / Neural Network / GA-based papers or patents published in IEEE / ACM / Springer / Elsevier or any reputed Journals. Analyze and design any new Intelligent Product / Service based on an Expert / Hybrid System.   
  Write the PEAS Descriptor, identify properties of the task environment and   
  type of agent for the Proposed System.**

***Instructions:***

Write theory for the following topics  [**(Refer to AI by Russell chapter 2 )**](https://docs.google.com/document/d/1muswmIh6jLwUv5BKO55fsFG7eTWSPzs4/edit#bookmark=id.tyjcwt)

* **Intelligent system and its characteristics.**
* **Significance of PEAS descriptor**
* **List down the Generic Properties of task environment**
* **Types of Agent with diagram**

***Outcome:***

1. **Write the PEAS descriptor, properties of the task environment, and type of agent for the selected problem**
2. **Write the PEAS descriptor, properties of task environment and type of agent for the Intelligent Systems proposed from Research paper.**

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**Experiment No: 4**

***Task to be performed:***

* **Formulate the Problem Statement for the above-chosen system**
* **Formulate the Problem Statement for the Proposed System (w.r.t Paper).**

***Instructions:***

Write theory for the following topics [**(Refer to AI by Russell pg: 66 - 74 )**](https://docs.google.com/document/d/1muswmIh6jLwUv5BKO55fsFG7eTWSPzs4/edit#bookmark=id.tyjcwt)

* **Components of Problem Formulation** 
  + Initial State
  + Successor Function
  + Transition State Space
  + Goal Test
  + Path Cost

***Outcome:***

1. **Problem Formulation for the above-chosen system in Experiment 1**
2. **Problem Formulation for the Proposed System (w.r.t Research Paper).**

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**Experiment No: 5**

***Task to be performed:***

**Uninformed Search (DFS/BFS) for 4 queen/8 queen/8 puzzles or any state space**

***Theory:***

1. What is uninformed search?
2. Explain all 5 uninformed search techniques

Breadth-first search

Uniform-cost search

Depth-first search

Iterative deepening search Bidirectional search

1. Compare all searching techniques

completeness:

time complexity:

space complexity:

optimality:

***Program/Output:***

***DFS or BFS for given stat space***

***Conclusion***

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**Experiment No: 6**

***Task to be performed:* Informed Search for TSP**

***Theory:***

1. What is informed search?
2. What is a Heuristic function?
3. Explain all informed search techniques
4. Compare all searching techniques

completeness:

time complexity:

space complexity:

optimality:

***Program/Output:***

***A\* for TSP***

***Conclusion:***

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**Experiment No: 7**

***Task to be performed:***

**Hill Climbing algorithm for 4-queen**

***Theory:***

1. ***What is hill climbing?***
2. ***Ex[plan Hill climbing algorithm with an example.***
3. ***When to use hill climbing?***
4. ***Problems faced by hill climbing?***
5. ***Different variance of hill climbing algorithm? (explain all)***

***Program/Output:***

***hill climbing for 4 queens***

***Conclusion***

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**Experiment No: 8**

**Prove:**

**The goal sentence from the following statements in FOPL by applying forward, backward, and resolution inference algorithms**.

***The task to be performed:***

KB for campus problem and its solution in prolog or any other programing language or resolution graph for given CNF

***Theory:***

1. ***Explain FOL***
2. ***Explain CNF***
3. ***Resolution***
4. ***Example: Wampus problem***

**Program**

**Output**

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**Experiment No : 9**

**Create a Bayesian Network for the given Problem Statement and draw inferences from it.**

**(You can use any Belief and Decision Networks Tool for modeling Bayesian Networks)**

***The task to be performed:***

Download the tool from the given website (.exe file)

<http://www.aispace.org/downloads.shtml>

Execute probability distribution refer following tutorial

http://aispace.org/bayes/help/tutorial5.shtml

**Theory:**

1. **Baye’s theorem**
2. **Basian belief network**
3. **Examples of each**

**Screenshots of the tool:**

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**Experiment No : 10**

**Case study of any existing successful AI system**

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