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Lab 6: Propositional Logic-Inference

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Research Interest: Computer Vision, machine learning, artificial intelligence, , deep learning, Background/Foreground Separation

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Main Contents

- Examples about Propositional Letters
- Conversion of Propositional Sentences into Clauses
- Problem Solution with Resolution Algorithm
- Adding KB and checking entailments

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Main Contents

❑ **Hints:**

(a) Set of propositional letters which can be used to represent this statement:

X: car is at John's house

Y: car is at Fred's house

¬X: car is not at John's house

Prop Logic – Inference

1. Consider the statement "The car is either at John's house or at Fred's house. If the car is not at John's house then it must be at Fred's house".

(a) Describe a set of propositional letters which can be used to represent this statement.
(b) Describe the statement using propositional formula on the propositions you described for (a).
(c) Can you determine where the car is?

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❑**Hints:**

2. A clausal sentence is either a literal (symbols and negated symbols) or a disjunction of literals

use De Morgan's law

3. The resolution algorithm tries to prove

KB ⊨ A iff (KB ^ ¬ A) is unsatisfiable

2. Convert the following propositional calculus sentence into clauses:

$$\neg [((P \vee \neg Q) \rightarrow R) \rightarrow (P \wedge R)]$$

3. Use Resolution Algorithm to solve the following problem

Given:

$B \wedge C \rightarrow A$

B

$D \wedge E \rightarrow C$

$D \vee E$

$D \wedge \neg F$

Query :

A

Can we entail the query from the knowledge base?

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❑**Hints:**

4. Example:

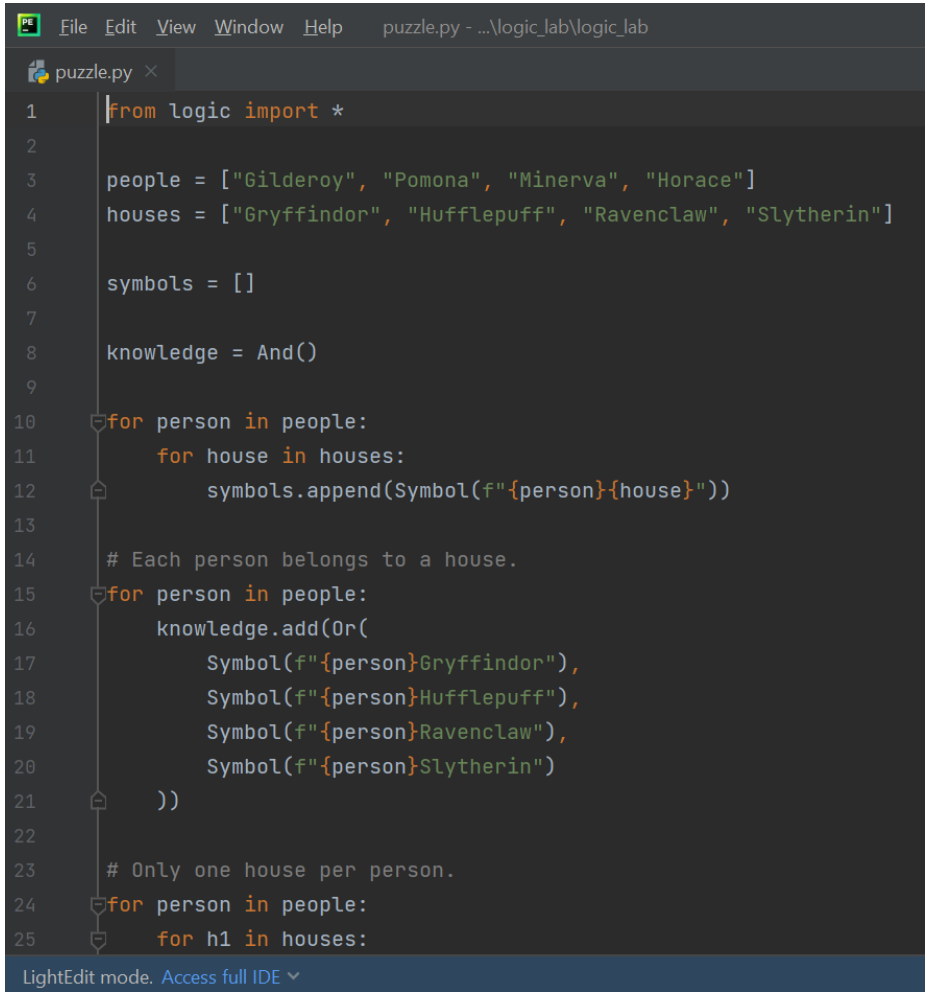
People and Houses

Each person belongs to a house

a) Only one house per person.

b) Only one person per house.

4. Go to puzzle.py and fill in the required pieces of code to add new knowledge into KB and check entailments.



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Q&A

- If you have any questions, you can ask me during lab sessions or contact at following email:

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