Ton Duc Thang University
Faculty of Information Technology

PROCESS 2 – ESSAY

Course: Introduction to Artificial Intelligence

Duration: 03 weeks

I. Formation

- The project is conducted in groups of 03 – 05 students.
- Student groups conduct required tasks and submit the project following instructions below.

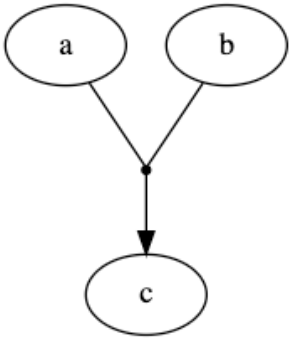
II. Tasks

a) Task 1 (8.0 point(s)): Forward Chaining in Propositional Logic

- Given a data file consisting of definite clauses, one clause per row, for example,

```
-a -b c
-b -c -d e
a
b
d
```

  - Literals are separated by spaces
  - "-" means negation
- Students implement a class named **Clause** to represent clauses with related information such as the premise, the conclusion, the number of known literals of the premise, etc.
- Draw a direct graph, using `graphviz`, to illustrate the given knowledge base read from the given data file. An implication can be displayed as below.



- Implement the Forward Chaining algorithm to verify whether the given knowledge base entails a symbol q, input by the user.

```
function PL-FC-ENTAILS?(KB, q) returns true or false
    inputs: KB, the knowledge base, a set of propositional definite clauses
            q, the query, a proposition symbol
    count ← a table, where count[c] is the number of symbols in c's premise
    inferred ← a table, where inferred[s] is initially false for all symbols
    agenda ← a queue of symbols, initially symbols known to be true in KB
    while agenda is not empty do
        p ← POP(agenda)
        if p = q then return true
        if inferred[p] = false then
            inferred[p] ← true
            for each clause c in KB where p is in c.PREMISE do
                decrement count[c]
                if count[c] = 0 then add c.CONCLUSION to agenda
    return false
```

- Students organize the program regarding to the OOP model, ensure source code is compact and reasonable.
- Recommended editor: Google Colab

b) Task 2 (2.0 point(s)): Report

- Student groups compose the project report using the IEEE conference proceeding template.
- Recommended editor: Overleaf.
- Selective contents:
  - *Title*: the project title
  - *Authors*: group member's information, the lecturer is appended as the last author.
  - *Abstract*: summarize the project requirements, approaches, experimental results, and levels of completion.
  - Each following section presents a task in the project, with a meaningful and human-readable title. Briefly introduce the approach to tackle the problem and illustrate results with related figures/tables, etc.

  - "*Contributions*" section: individual tasks, individual completion levels (0%-100%).
  - "*Self-evaluation*" section: self-evaluate task completion and estimate scores.
  - "*Conclusion*" section: summarize the project requirements, approaches, experimental results, and levels of completion.
- References are in the IEEE format.
- Maximal length is 05 pages.

III. Submission Instructions

- Create a folder whose name is as

process2_<group ID>_<your student ID>

- Content:
  - **source** → project folder, each task is located in a subfolder
  - **report.pdf** → report.
  - **demo.txt** → URL to the demo video with **the maximal duration of 03 minutes**.
- Compress the folder into a zip file and submit by the deadline.
- Every member must submit the project.

IV. Policy

- **Student groups submitting late get 0.0 points for each member.**
- **Missing required materials in the submission loses at least 50% points of the presentation.**
- **Copying source code on the internet/other students, sharing your work with other groups, etc. cause 0.0 points for all related groups.**
- **If there exist any signs of illegal copying or sharing of the assignment, then extra interviews are conducted to verify student groups' work.**
- **AI tools are forbidden in this project.**

-- THE END --