**Intelligent Systems**

**Exercise 10. Knowledge Representation   
 in Propositional Logic**



# Exercise description

The objective of this exercise is to apply the concepts of knowledge representation to translate English statements into Propositional Logic sentences.

**Team members**

Write the student id, name, and campus of each member in a different line.

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**For each of the following English statements, define a vocabulary of positive propositions and translate into Propositional Logic sentences:**

1. John is going to the store.

Vocabulary:

S: John is going to the store

Translation:

S

1. The sun rises in the East and sets in the West.

Vocabulary:

S: The sun rises in the East

P: The sun sets in the West

Translation

S ^ P

1. It will not rain or snow.

Vocabulary:

S: It will rain

P: It will snow

Translation:

~(S v P)

1. John is going to the store today, but Mary is not.

Vocabulary:

S: John is going to the store today

P: Mary is going to the store today

Translation:

S ^ ~P

1. Either today is Friday or it is raining today, but not both.

Vocabulary:

S: Today is Friday

P: Is raining today

Translation

(S v P) ^ ~(S ^ P)

1. It is not true that I have not studied the exam, but they will still suspend me.

Vocabulary:

S: I have studied the exam

P: They will suspend me

Translation:

~(~S )^ P

1. You can access the Internet from campus only if you are a computer science major or you are not a freshman.

Vocabulary:

S: You can access the internet from campus

P: You are a computer science major

R: You are a freshman

Translation:

S -> (P v ~R)

1. If it is your birthday or there will be cake, then there will be cake.

Vocabulary:

S: It is your birthday

P: There will be cake

Translation:

(S v P) -> P

1. It is false that if Sam is not a man then Chris is a woman, and that Chris is not a woman.

Vocabulary:

S: Sam is a man

P: Chris is a woman

Translation:

~((~S -> P) ^ ~P)

1. Paris is the most important city in France if and only if Paris is the capital of France and Paris has a population of over two million.

Vocabulary:

S: Paris is the most important city in France

P: Paris is the capital of France

R: Paris has a population of over two million

Translation:

S <-> (P ^ R)