

# Assignment 1: Translations

**Due Wednesday, January 31th, 2018:** A PDF, submitted on Sakai, featuring four sensible natural English sentences, their translations into sentential logic, and the truth tables for the translations. The sentences must satisfy the following conditions:

1. The logical expression of each sentence must make *all* the logical structure of the sentence explicit.

Example: “Gabriel doesn’t like cheese.” shouldn’t be an atomic sentence since it contains a “not”; the atomic sentence should be “Gabriel likes cheese.”, represented by (say)  $G$ , and then the full sentence can be represented as  $\neg G$ .

Note: A biconditional should not be broken up into a conjunction and implication. If your sentence contains a biconditional, that should be explicit in its logical expression.

2. Each sentence must involve at least two different connectives from our collection ( $\wedge$ ,  $\vee$ ,  $\neg$ ,  $\rightarrow$ , and  $\leftrightarrow$ ).

Example: The sentence “An absence from work will be excused if you or a dependent are ill.” may be translated (where  $A$  is “An absence from work will be excused.”,  $I$  is “You are ill.”, and  $D$  is “Your dependent is ill.”) as  $(I \vee D) \rightarrow A$ . Since it includes two connectives (disjunction and implication), it counts!

3. Every connective from our collection must appear at least once among all the sentences.

Example: If your first three sentences are all made up of negations and conjunctions, then the last sentence will have to include (at least) a disjunction, a material conditional, and a biconditional.

4. No two sentences can have the same logical structure. Differences in sentence letters don’t count towards a difference in logical structure, nor does rearrangements of sentence letters that don’t yield a different truth table.

Example:  $(I \vee D) \rightarrow A$  has the same logical structure as  $(P \vee Q) \rightarrow R$ , and  $A \vee B$  has the same logical structure as  $B \vee A$ .

Note that you can copy and paste the logical symbols from this PDF into your text document while you type the assignment up. Any text document can be converted into a PDF. If you need help figuring out how—or, of course, if you need help with anything related to this assignment—please contact me at: [mbialek@rutgers.edu](mailto:mbialek@rutgers.edu)