Translation from English to a Formal Language for Sentential Logic

The first part of translating English sentences into our formal language involves construction of a translation scheme, i.e. a pairing of sentence letters with sentences in the natural language. Make sure that the natural language sentences you pair with sentence letters are logically simple, i.e. they don’t contain any of the words corresponding to any of our sentential connectives (∼, &, ∨, →, ↔).

**Negations:** If we let B translate the sentence “Bob is happy,” then a few stylistic variants of the logical form ~B would include:

- Bob is not happy.
- Bob is unhappy.
- It is not true that Bob is happy.
- It is not the case that Bob is happy.
- It is false that Bob is happy.
- Bob fails to be happy.

**Conjunctions:** If we let D translate the sentence “Descartes was a rationalist,” and L translate the sentence “Locke was an empiricist,” then a few stylistic variants of the logical form (D & L) would include:

- Descartes was a rationalist and Locke was an empiricist.
- Descartes was a rationalist, but Locke was an empiricist.
- Descartes was a rationalist, however, Locke was an empiricist.
- While Descartes was a rationalist, Locke was an empiricist.
- Although Descartes was a rationalist, Locke was an empiricist.
- Descartes was a rationalist, yet Locke was an empiricist.
- Descartes was a rationalist; nevertheless, Locke was an empiricist.
- Descartes was a rationalist even though Locke was an empiricist.
- Descartes was a rationalist though Locke was an empiricist.
- Descartes was a rationalist; also Locke was an empiricist.

**Disjunctions:** Remember that the way we have defined the ∨ is such that its use is inclusive! So, if we were to let C translate the sentence “Carol attends college, and J translate the sentence “Carol gets a job,” then the following are a few stylistic variants of the logical form (C ∨ J):

- Carol attends college and/or she gets a job.
- Carol attends college or she gets a job.
- Either Carol attends college or she gets a job.
- Carol attends college unless she gets a job.*

*“Unless” is usually translated as “if not.” Thus, in the fourth example above, we could equally translate the compound sentence as : (∼J → C).
**Conditionals:** If we let R translate the sentence “It rains,” and C translate the sentence “there are clouds in the sky,” then some common **stylistic variants** of the logical form \((R \rightarrow C)\) are:

- *If* it rains, there are clouds in the sky.
- *If* it rains, *then* there are clouds in the sky.
- There are clouds in the sky, *if* it rains.
- *Given that* it rains, there are clouds in the sky.
- There are clouds in the sky, *given that* it rains.
- *Assuming that* it rains, there are clouds in the sky.
- There are clouds in the sky, *provided that* it rains.
- *On the condition* that it rains, there are clouds in the sky.
- It raining *is a sufficient condition that* there are clouds in the sky.
- Clouds in the sky are *a necessary condition for* it raining.

**Biconditionals:** If we let N translate the sentence “Norm is a bachelor,” and M translate the sentence “Norm is an unmarried male,” then some common **stylistic variants** of the logical form \((N \leftrightarrow M)\) are:

- Norm is a bachelor *if and only if* he is an unmarried male.
- Norm is a bachelor *is equivalent to* Norm is an unmarried male.
- Norm is a bachelor *just in case* he is an unmarried male.
- Norm is an unmarried male, *which is both sufficient and necessary* to his being a bachelor.

**Premise indicators:** Terms which will often indicate the premise(s) of an argument include:

- *since*
- *in that*
- *seeing that*
- *as indicated by*
- *inasmuch as*
- *because*
- *as*
- *for*
- *given that*
- *owing to*
- *may be inferred from*
- *for the reason that*

**Conclusion indicators:** Terms which will often indicate the conclusion of an argument include:

- *therefore*
- *hence*
- *whence*
- *wherefore*
- *thus*
- *so*
- *accordingly*
- *consequently*
- *it follows that*
- *we may conclude*
- *we may infer*
- *implies that*
- *entails that*
- *it must be that*
- *as a result*

**Standard Form:** Use the premise and conclusion indicators to help you place the argument into standard form so that you can then determine if the argument is *valid* or not:

- Premise 1
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- Premise n
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- Conclusion