Deduction Handout

Deductive Arguments: aim for logical necessity, a formal logical relation between the premises and the conclusion such that if the premises are true, the conclusion must be true.

Valid (Deductive) Arguments: succeeds in achieving this logically necessary relation between premises and conclusion. A valid argument is one in which the truth of the premises guarantees the truth of the conclusion. Another way to put this: it is not possible for the premises to be true and the conclusion to be false.

Invalid (Deductive) Argument: doesn’t succeed in achieving this logically necessary relation between premises and conclusion. An invalid argument is one in which the truth of the premises does not guarantee the truth of the conclusion. Another way to put this: it is possible for the premises to be true and the conclusion to be false.

Sound Argument: a valid argument with in fact true premises and a true conclusion

4 Common Valid Arguments

Disjunctive Syllogism
p or q
It’s not the case that p
Therefore, q

Modus Ponens (Affirming the Antecedent)
If p then q
p
Therefore, q

Modus Tollens (Denying the Consequent)
If p then q
It’s not the case that q
Therefore, it’s not the case that p

Hypothetical Syllogism
If p then q
If q then r
Therefore, if p then r
2 Common Invalid Arguments (Formal Fallacies)

Denying the Antecedent
If p then q
It’s not the case that p
Therefore, it’s not the case that q

Affirming the Consequent
If p then q
q
Therefore, p