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Homework - 01
Knowledge Representation.

Problem 1.

1. It is not cloudy and it is not raining. Solution: Let p = it is cloudy, and let q = it is raining. Then $\neg p \wedge \neg q$.

2. I like to eat apples and bananas. Solution: Let p = I like to eat apples, and let q = I like to eat bananas. Then $p \wedge q$.

OR

Solution: Let p = I like to eat apples, and let q = bananas. Then $p \wedge q$.

3. Behind the clouds the sun is shining. Solution: Let p = behind the clouds, and let q = the sun is shining. Then $p \rightarrow q$.

4. If a function is differentiable then the function is continuous. Solution: Let p = the function is differentiable, and let q = the function is continuous. Then $p \rightarrow q$.

5. I will study for the final otherwise I will fail. Solution: Let p = I will study for the final, and let q = I will fail. Then $\neg p \rightarrow q$.

Problem 2.

1. $p \wedge q$ and $p \vee \neg q$

p	q	$p \wedge q$	$p \vee \neg q$
T	T	T	T
T	F	F	T
F	T	F	F
F	F	F	T

As we can see, for 2 of the 4 possible cases, these two expressions have different outcomes. Therefore, they are not equivalent.

2. $p \vee q$ and $\neg p \vee \neg q$

p	q	$p \vee q$	$\neg p \vee \neg q$
T	T	T	F
T	F	T	T
F	T	T	T
F	F	F	T

As we can see, for 2 of the 4 possible cases, these two expressions have different outcomes. Therefore, they are not equivalent.