CSC165H1 S - Exercise 1

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Question 1:

Solution: I hereby **give** permission for any of my written work from CSC 165H1S to be used anonymously in the WIT Project.

Question 2:

(a) Solution: The statement is FALSE.To prove it is wrong, we just need to give a counter-example. As Computer 5 has none of three types of operating systems, it disproves the statement.

(b) Solution: The statement is TRUE. This statement is equivalent to "if a computer runs Mac OS X, it does not run other types of operating systems". To prove it is true, we have to check every single computer that satisfies that it runs Mac OS X, which is Computer 2 in this database. As Computer 2 only runs this operating system without any other types, the statement is proved true.

(c) Solution: The statement is FALSE. Similarly, it is equivalent as "if a computer runs Ubuntu, it must also have Windows 7". To disprove it, we have to also give a counter-example. As Computer 6 runs Ubuntu without Windows 7, the statement is false.

Question 3:

(a) Define: Set **x** be a random student, **C** be students who are taking CSC165, **D** be CSC165 students who do the homework and **G** be students get a good mark in the course.

Rewrite: $\forall x \in C, D(x) \Rightarrow G(x)$

(b) Rewrite: $\forall x \in D, G(x)$

(c) i. If a CSC165 student does not do his or her homework, he or she will not get a good mark in the course.

ii. $\forall x \in C, \neg D(x) \Rightarrow \neg G(x)$ WRONG HERE!!!!

(d) i. If a CSC165 student gets a good mark in the course, he or she will do his or her homework.

ii. $\forall x \in C, G(x) \Rightarrow D(x)$

Question 4:

(a) Rewrite: If the computer is on a network, then that computer has an IP address.

(b) Define: Set **x** be a random computer, **N** be the computer with a network and **A** be the computer which has an IP address.

Rewrite: $\forall x \in N, A(x)$

(c) Define:

Use the same **x, A** in (b); Also set **F** be the computer that can share files.

Rewrite: $A(x) \Rightarrow F(x)$ wrong here

(d) Conclusion: Computer x can share files.

Reasoning: According to (S2), x is computer on a network, so x has an IP address. Then according to (S3), computer x has an IP address, which implies it can share files.

(e)Reasoning: Nothing can be concluded. As x does not have an IP address, whether it can share files is unknown. In other words, we are sure $A(x) \Rightarrow F(x)$ but not $F(x) \Rightarrow A(x)$, so we cannot conclude that $\neg A(x) \Rightarrow \neg F(x)$.

wrong here