CSE 103: Discrete mathematics

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Chapter-1, Section-1

Problem 6:

Suppose that Smartphone A has 256MB RAM and 32GB ROM, and the resolution of its camera is 8 MP; Smartphone B has 288 MB RAM and 64 GB ROM, and the resolution of its camera is 4 MP; and Smartphone C has 128 MB RAM and 32 GB ROM, and the resolution of its camera is 5 MP. Determine the truth value of each of these propositions.

a) Smartphone B has the most RAM of these three smartphones.

b) Smartphone C has more ROM or a higher resolution camera than Smartphone B.

c) Smartphone B has more RAM, more ROM, and a higher resolution camera than Smartphone A.

d) If Smartphone B has more RAM and more ROM than Smartphone C, then it also has a higher resolution camera.

e) Smartphone A has more RAM than Smartphone B if and only if Smartphone B has more RAM than Smartphone A.

Solution:

a. This proposition is True.

b. The Second part of this disjunction is True so the proposition is also True.

c. The Third part of this conjunction is False, so the proposition is also False.

d. The First part of the conditional statement is True but the Second part is False, according to the truth-table definition, the statement is False.

e. This biconditional statement is False because the first part of the statement is False whereas the Second part is True. So according to the truth-table definition, the biconditional is False.