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Problem 1 : Sec 1.5, # 4

Let P(x, y) be the statement "Student x has taken class y," where the domain for x consists of all students in your class and for y consists of all computer science courses at your school. Express each of these quantifications in English.

(a) $\exists x \exists y P(x, y)$

(b) $\exists x \forall y P(x, y)$

(c) $\forall x \exists y P(x, y)$

(d) $\exists y \forall x P(x, y)$

(e) $\forall y \exists x P(x, y)$

(f) $\forall x \forall y P(x, y)$