A1 - CS348

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Q1 1. $\{(s,n) \mid \exists s,n,c_1,c_2,x_1,x_2,y_1,y_2,g_1,g_2.\ student(s,n,2) \wedge mark(s, courseyrdept(c_1,1,CS), x_1, y_1, g_1) \wedge mark(s, courseyrdept(c_2,1,CS), x_2, y_2, g_2) \wedge g_1 \leq 65 \wedge g_2 \leq 65 \wedge c_1 \neq c_2\}$

2. $\{(p,n) \mid \exists p,n,o,s,x,y,g.\ professor(p,n,o,CS) \wedge mark(s, CS348, x, y, g) \wedge g < 60\}$

3. $\{(p,n) \mid \exists p,n,c,c_1,c_2,x,x_1,x_2,y,y_1,y_2,o,d,$ $\cdot professor(p,n,o,d) \wedge \neg class(c_1,x_1,y_1,p) \vee \neg class(c_2,x_2,y_2,p) \wedge class(c,x,y,p) \wedge d != PM\}$

4. $\{(s,n) \mid \exists s,n,c,x,y,g.\ student(s,n,4) \wedge mark(s,c,x,y,g) \wedge c != CS240 \wedge c != CS348\}$

5. $\{(p,n) \mid \exists p,n,o,d,c,x,y.\ professor(p,n,o,CS) \wedge \neg class(c,x,y,p) \wedge c != CS234 \wedge c != CS348\}$

6. $\{(s,n,y) \mid \exists s,n,y,x,y,g.\ student(s,n,y) \wedge mark(s, CS240, x, y, g) \wedge g \geq max(g) - 5\}$

7. $\{(p,n) \mid \exists p,n,o,d,x,y,s$ $\cdot professor(p,n,o,d) \wedge class(CS240, x, y, p) \wedge mark(s, CS240, x, y, g) \wedge g = max(g)\}$

8. $\{(s,n) \mid \exists s,n,y,x,y,x,y,p,p,o,d,g,g,student(s,n,y) \wedge y > 2 \wedge \neg mark(s, courseyrdept(c_1,y_3,CS),x,$ $\vee g \geq 85 \vee professor(p,p,n,o,d)$ $\vee g != 0$ $\forall c \neg class(courseyrdept(c_1,y_3,CS),x,y,g))$

9. Not possible to express ratio.

10. $\{(p, pn, c, cn) \mid \exists p, pn, c, cn, o, d, t, r$. professor$(p, pn, o, (s)$
$\wedge$ course(c, c, x, y)
$\wedge$ schedule(c, x, y, d, t, r)
$\wedge (d = \text{Mon} \ldots$ $d = \text{Friday}$
$\wedge g = \max(s)$
$\vee g = \min(g)$