HW5 Lanc Young

1.) 1) $D \to C$ does not hold because of the output:
$4 \to 4$ D is not determining C uniquely
$4 \to 3$

2) $C \to B$ does hold

3) $A \to BCD$ does hold A is unique

2) 1) $(AC)^+ = ABEC$

2) (ADG) because we will have a connection to all
Ex: $(ADG)^+ = ABEDGC$

3.) 1) C is the common attribute and the candidate Key in Decomposition and is loss-less join

2) A is the common attribute, but is not the candidate Key since it is $A \to E$ making it a lossy decomposition

4) 1) Movie_schema (N, A, F, T, Y, L, G, D)
(M or N) A B C D E F G (agent) H (address of agent)
$F = \{ N \to F, G, D$
$N, T \to F$
$T, Y \to L$
$G \to D \}$

Key = NATY because
$(NATY)^+ = NATYFGDL$

BCNF

$R_1(NFGD)\{$
$N \to FGD$
$G \to D \}$

$R_2(NTFGD)\{$
$NT \to F \}$

$R_3(TYL)\{$
$TY \to L \}$

$R_1(GD)$ $G \to D$

$R_{12}(NFGD)$ $N \to FGD$

2.) The movie_schema is not 3NF because of the transtive relationship $G \to D$