Assignment 2 of CS2209A

Completion of the assignment must be an individual effort.
Due date: 2021.10.8 (by 11:55 pm)
This assignment is worth 10% towards your final mark.

You need to complete the following sets of LogiCola exercises. For each set that you complete, set your "Scoring Level" to 8 or higher.

1. D-AM, 1% (use truth table to prove an argument)
2. D-AH 2% (save as 1 but more propositions. Note: LogiCola "forces" you to complete the whole table in order to draw conclusions. In exams, you can skip parts of the table using the "short-cut" methods mentioned in slides/textbook. Of course, if you skip the wrong parts, marks would be deducted).
3. E-S, 1% (in exams, you need to show us how you do it on paper)
4. E-E 1% (Easy to pass in LogiCola, but in exams, you first need to translate all premises and the conclusion into WFFs. Then prove with methods specified, such as truth table as 1/2 here, truth argument as 3 here, or s/i rules as 6/7/8 here, on paper)
5. F-CH (1%, use s/i rules)
6. G-EV (1%, refutation. In exams, you need to perform this on paper)
7. G-HV (2%, refutation with additional assumptions. In exams, you need to perform this on paper).
8. G-EI (1%. In exams, you need to do this on paper)

How to Submit:
Submit your score file via [OWL](OWL) (just as you'd submit a PDF file) before the deadline.

$\sim(P \cdot (C \vee S))$.

$\sim(P \cdot T)$ T.

P F.

$F \supset (D \cdot G)$.

$\sim P \vee \sim R$. $F \vee \sim R$ T.

P $\sim R \equiv T$.

$\sim R$. $R \equiv F$

$(R \cdot \sim D) \supset F$.

$R \cdot \sim D$ T.

$R \equiv T$ && $D \equiv F$.

$S \supset (B \cdot L)$. $\equiv T$.

$S \supset (T \cdot L)$ $\equiv T$.

$F \supset (T \cdot L)$.

$S \vee \sim F \equiv F$. $S \supset T$ T. $S \supset F$ $\equiv T$.

$\sim F \equiv F$ $F \supset F$ $\equiv T$.

$F \equiv T$. $S T$ $S F$ S F.

$\sim R \vee \sim F$. T. $R \vee F$ F. R F

R $\sim F$

$$\frac{R}{\sim F}$$

$(B \wedge F) \supset \sim H$. $B \supset F$ $B \equiv F$

H $\sim B$

F

$$\frac{F}{\sim B}$$

$\sim S \subset \sim(B \wedge \sim F)$. $\sim S \subset F$.

B $S \equiv$

$\sim F$

$$\frac{\sim F}{\sim S}$$.

$P \supset (C \supset L)$ T. $C \supset L \equiv T.$

P $C \supset F \equiv T$

$\sim L$ $T \supset (C \supset L).$ $C \equiv F$

$\sim C.$ $\sim C.$

@ $(D \cdot L) \supset H.$ $F \supset H.$

L

$\sim D$

$\sim H.$

$\sim P \supset \sim(R \vee L).$ $\sim P \supset F.$ $S \supset \sim(C \wedge \sim F).$

$\sim R$ $\sim C$ $S \supset T.$

L T. $\sim F$

P $\sim S.$

$\sim B \supset \sim R$

R

$B.$

$G \supset (C \vee F).$

$\sim C$

$\sim G$

$\sim F.$

$(C \vee \sim P) \supset \sim L.$

L $F \supset F.$

$P.$

$C \vee \sim P \equiv F.$

$L \equiv \sim B$

$\sim L$

$(P \vee B) \supset (F \wedge D)$

$T \supset$

$\sim(\boxed{(C \wedge \sim F)}). \equiv. F$

$F. \equiv T.$ $C \wedge T. \equiv F.$

$C.$ $C \equiv F.$

$\sim S \vee \sim H$

$\frac{\sim S}{H.}$

$(S \vee L) \subset (L \wedge F).$

$\frac{\sim S.}{\sim L.}$

$L \subset (R \wedge S)$

$R.$

$\sim (I \cdot S).$

$I.$

$\sim (T \cdot S).$

$\sim S$ T.

S F.

$(D \wedge C) \subset L.$

$\frac{\sim L}{\sim C}$ $\boxed{D \wedge L = F.}$

F.

$P \subset (R \vee D).$

$\sim R.$

$\frac{\sim D}{\sim P}$

$P \vee \sim M$ $\sim F$, T.

P.

$\sim F$ T.

$\boxed{\sim (K \cdot F) \quad T}$

$P \supset \sim A$

P $F \to T.$

$\sim P$

T F.

O U.

$F \to Q$

$0 \quad \boxed{Q \to F}$

$\sim R \vee \sim F = F$

$\sim R = F$ $R = T$

$\sim F = F$ $F = T$

$Y = T$

$G = F.$

F.

$\sim (F \cdot P)$

$\sim (\sim U \cdot O).$

$\sim (\sim U \cdot T).$

$(\sim O \cdot X) = F.$

$(T \cdot X) = F$

~U · Q = F

X = F.

~K ⊃ (~N ⊃ ~Z)

U ⊃ ~K

~H ≡ U

~(N ∨ H).

N = F   H = F.

U = T.   K = F.

T ⊃ ~K   T.

K F.

T ⊃ (T ⊃ ~Z)   T.

T ⊃ ~Z   T.

~Z = T

Z = F.

LogiCola Set G (EV) - Score (level 9) = 0

File   Options   Tools   Help

*	1	(~K ⊃ (~N ⊃ ~Z))	
*	2	(U ⊃ ~K)	
*	3	(~H ≡ U)	
*	4	~(N ∨ H)	
		[∴ ~Z	
	5	asm: Z	
*	6	∴ (~H ⊃ U)	{from 3}
	7	∴ (U ⊃ ~H)	{from 3}
	8	∴ ~N	{from 4}
	9	∴ ~H	{from 4}
	10	∴ U	{from 6 and 9}
	11	∴ ~K	{from 2 and 10}
*	12	∴ (~N ⊃ ~Z)	{from 1 and 11}
	13	∴ N	{from 5 and 12}
	14	∴ ~Z	{from 5; 8 contradicts 13}

Valid

This proof shows that the argument is valid.

Set G (EV). Propositional Proofs (Easier, Valid, program stars)

$\sim(E \vee \sim J)$.

$\sim E \wedge J$.

$\sim(\sim(\sim K \cdot \sim G))$ $\quad \sim K \cdot \sim G = T$.

P E G F.

$\sim(\sim(\sim K \cdot \sim T)) = T$.

$\sim F \supset M = F$.

$F \supset M$.

$\sim(\sim F \supset M)$.

$= \sim(F \vee M)$

$= \sim F \cdot \sim M$. $\quad$ T.

$\sim(\sim Q \cdot \sim S)$.

$Q \vee S$.

$\sim(\sim(\sim S \cdot \sim L) \cdot \sim Y)$. $= T$.

$((\sim S \cdot \sim L) \vee Y) = T$.

$Q \vee S$.

$\sim X \vee \sim J$. $\quad$ T.

$\sim(L \cdot Z) \vee S$.

$Y \vee \sim(K \cdot Q)$ $\quad$ T.

$\sim(K \vee \sim X)$.

$(\sim K \wedge X)$.

$\sim(S \vee U)$.

$\sim S \wedge \sim U$

U

$\sim N \wedge A$.

$\sim N \vee X$.

$\sim N$.

$\sim(K \vee \sim S)$.

$(\sim K \wedge S)$.

$\sim I \wedge K$.

$S \vee G$.

$\sim L \equiv F$.

$\sim(L \equiv T)$.

$L \equiv F$.

$P \vee H$.

$P \vee J$.

$\sim(T \supset U)$.

$= T \wedge \sim U$

$\sim Q \vee I$. $\quad$ T

$I \vee \sim T$. $\quad$ $\sim U$

$\vee \sim Q$.

$\sim(\sim P \cup \sim A)$.

$P \cap A$.

$\sim(\sim B \cdot \sim S)$.

$= B \cup S$

$\sim B \quad \sim(F \cdot \sim S) = T$.

$\sim[(M \cdot Q) \vee (\sim M \cdot \sim Q)]$.

$= [\sim(M \cdot Q) \wedge \sim(\sim M \cdot \sim Q)]$.

$= \sim M \vee \sim Q. \quad M \vee Q.$

$((\sim P \cdot \sim Q) \vee (P \cdot Q))$.

$\sim(L \cup \sim H)$.

$\sim L \wedge H$.

$\sim(M \cup \sim F)$.

$\sim M \wedge F$.

$\sim(K \cup I)$.

$\sim K \wedge \sim I$.

$E \equiv Y$.

E

$\sim(N \cup \sim A)$.

$\sim N \wedge A$.

$\sim(X \vee K)$.

$\sim X \wedge \sim K$.

$\sim(\sim L \vee K)$.

$L \wedge \sim K$.

$\sim J \wedge T$.

$\sim(Z \cup H)$.

$\sim Z \wedge \sim H$.

$\sim(L \cup \sim H)$.

$(\sim L \wedge H)$.

$\sim(P \cup \sim A)$.

$(\sim P \wedge A)$.

$E \wedge Y$

$\sim(M \cup \sim F)$.

$\sim M \wedge F$.

$\sim(\sim M \cdot Q)$.

$Q \vee \sim P$.

Q.

$\sim T \vee E$.

$(P \vee \sim(\sim U \vee \sim Q))$.