Intro to CS Sheet #06

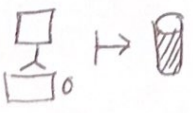
*) Problem 6.1=

a) c2 ⇒ 1100 0010
ac ⇒ 1010 1100
f0 ⇒ 1111 1111
9f ⇒ 1001 1111
92 ⇒ 1001 0010
bb ⇒ 1011 1011
e2 ⇒ 1110 0010
86 ⇒ 1000 0110
f0 ⇒ 1111 0000
9f ⇒ 1001 1111
97 ⇒ 1001 0111
91 ⇒ 1001 0001

b) u+00AC u+1F4BB u+21A6

u+1F501

These unicode code points represent

¬  ↦   i.e a not sign, PC/laptop emoji, arrow, trashcan emoji

Problem 6.2=

a) $D(B,F,I) := (\neg B \to F) \wedge ((B \wedge F) \to \neg I) \wedge ((I \vee \neg B) \to \neg F)$

b)

B	F	I	$\neg B \to F$	$(B \wedge F) \to \neg I$	$(I \vee \neg B) \to \neg F$	Resultant Output
0	0	0	0	1	1	0
0	0	1	0	1	1	0
0	1	0	1	1	1	0
0	1	1	1	1	0	0
1	0	0	1	1	0	0
1	0	1	1	1	1	1
1	1	0	1	1	1	1
1	1	1	1	0	0	0

c) Using the table to derive a formula of Boolean Algebra and simplifying it as follows=

$$(B \cdot \overline{F} \cdot \overline{I}) + (B \cdot \overline{F} \cdot I) + (B \cdot F \cdot \overline{I})$$

$$= (B \cdot \overline{F})(\overline{I} + I) + (B \cdot F \cdot \overline{I})$$

$$= (B \cdot \overline{F})(1) + (B \cdot F \cdot \overline{I})$$

$$= B(\overline{F} + F \cdot \overline{I})$$

$$= B(\overline{F} + \overline{I}) \quad \text{// simplified version i.e}$$

$D(B,F,I) := B \wedge (\neg F \vee \neg I)$