CPSC 406

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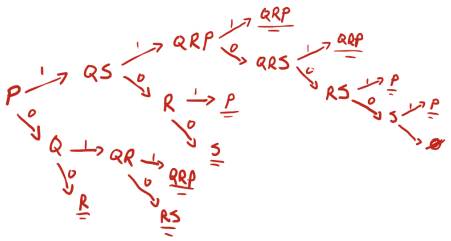
Abstract

A very short introduction to typesetting in LaTeX for my courses "Programming Languages", "Compiler Construction" and "Algorithm Analysis".

Contents

1 Homework

1.1 HW 1



State	0	1
P	Q	QS
R	S	P
Q	R	QR
S	Ø	P
QS	R	QRP
QR	RS	QRP
RS	S	P
QRP	QRS	QRP
QRS	RS	QRP

NFA2DFA In order to convert the provided NFA to DFA I considered each possible combination of P, Q, R, and S, and considered each possible combination its own state. The included figure details every possible state the NFA/DFA may find itself in.

1.2 HW 2

Question 1:

1. $f(X, f(X,Y)) \stackrel{?}{=} f(f(Y,a), f(U,b))$

$X \stackrel{?}{=} f(Y,a)$ $\quad f(X,Y) \stackrel{?}{=} f(U,b)$

$\sigma_1 = \frac{f(Y,a)}{X}$ $\quad X = U$ $\quad Y = b$

$\sigma_2 = \frac{U}{X}$ $\quad \sigma_3 = \frac{b}{Y}$

$\sigma = \left[\frac{f(Y,a)}{X}, \frac{U}{X}, \frac{b}{U}\right]$

2. $f(g(U), f(X,Y)) \stackrel{?}{=} f(X, f(Y,U))$

$g(U) \stackrel{?}{=} X$ $\quad f(X,Y) \stackrel{?}{=} f(Y,U)$

$X \stackrel{?}{=} Y$ $\quad Y \stackrel{?}{=} U$

$X \stackrel{?}{=} U$

$\sigma = \frac{g(X)}{X}$ Fail

3. $h(U, f(g(V), W), g(W)) \stackrel{?}{=} h(f(X,b), U, Z)$

$U \stackrel{?}{=} f(X,b)$ $\quad f(g(V), W) \stackrel{?}{=} U$ $\quad g(W) \stackrel{?}{=} Z$

$f(g(V), W) \stackrel{?}{=} f(X,b)$ $\quad \sigma_3 = \frac{g(W)}{Z}$

$g(V) \stackrel{?}{=} X$ $\quad W \stackrel{?}{=} b$

$\sigma_1 = \frac{g(V)}{X}$ $\quad \sigma_2 = \frac{b}{W}$

$\sigma = \sigma_1 \circ \sigma_2 \circ \sigma_3 = \left[\frac{g(V)}{X}, \frac{b}{W}, \frac{g(W)}{Z}\right]$

Question 2:

?- conn(W,a), conn(a,W)

?- addr(W,a), addr(a,Z), serv(Z), addr(Z,W) `?- twoway(W,a)`

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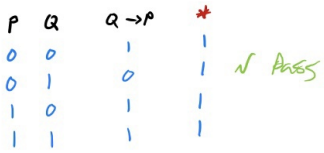
?- conn(W,a), conn(a,W)
?- addr(W,a), addr(a,Z), serv(Z), addr(Z,W)
```

1.3 HW 6

1. $P \vee \neg P$

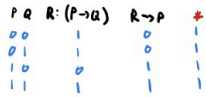
2. $(P \to Q) \to (\neg Q \to \neg P)$

3. $P \to (Q \to P)$



4. $(P \to Q) \vee (Q \to P)$

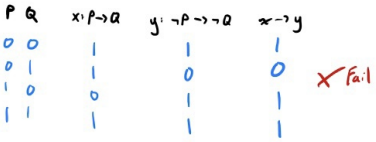
5. $((P \to Q) \to P) \to P$



6. $(P \vee Q) \wedge (\neg P \vee R) \to Q \vee R$

7. $(P \vee Q) \to (P \wedge Q)$

8. $(P \to Q) \to (\neg P \to \neg Q)$



2 Conclusions

In this document, to help you getting started, I gave a first succinct example of typesetting in Latex.

References

[ALG] Algorithm Analysis, Chapman University, 2023.