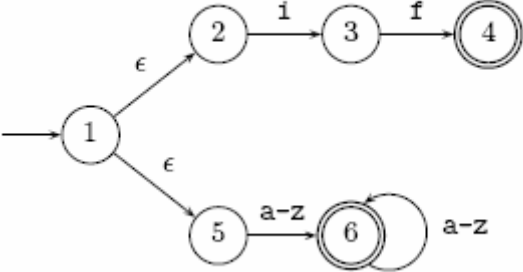


CS503 Homework #3

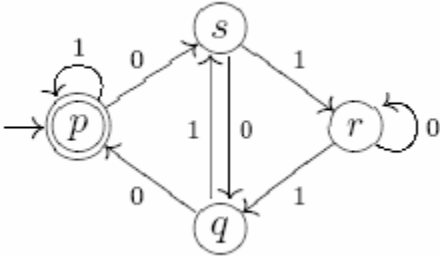
People I talked to, urls I looked at:

#1. Consider the following nfa that will recognize both the keyword “if” and identifiers that consist of at least 1 letter:



Use the subset construction to convert this nfa to a dfa:

#2. Create the regular expression for the following by eliminating states. Please eliminate r first, then s, then q:



**Eliminating s:**

**#3. Consider the following operation  $-3$  on regular languages  $L$ :**

$$L^{-3} = \{w \mid y w \in L \text{ and } |y| = 3\}$$

**Show regular languages are closed under the  $-3$  operation.**

**#4. Show that it is decidable whether a regular language,  $L$ , contains 1000 strings or more.**

**#5 Use the pumping lemma to show**

**a)  $L = \{w \mid w \text{ contains twice as many } a\text{'s as } b\text{'s}\}$  is not regular**

**b)  $L = \{0^n \mid n \text{ is a power of } 2\}$**