

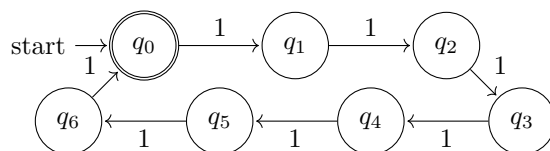


Homework — Algorithms and Data Structures

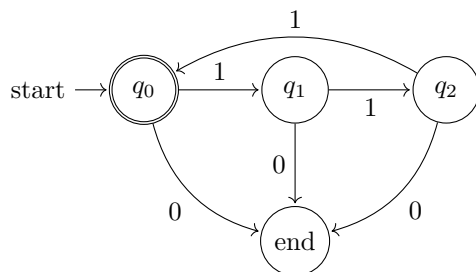
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Worksheet 8

1. (a)



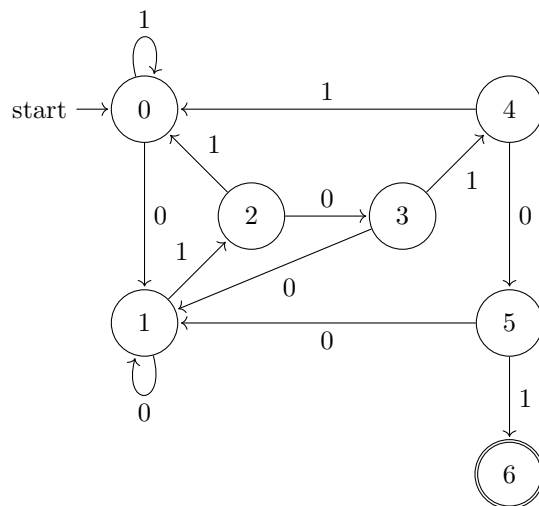
(b)



2. (a)

$$\begin{aligned}
 f(1) &= 0, & f(2) &= 0, \\
 f(3) &= 1, & f(4) &= 2, \\
 f(5) &= 3, & f(6) &= 4
 \end{aligned}$$

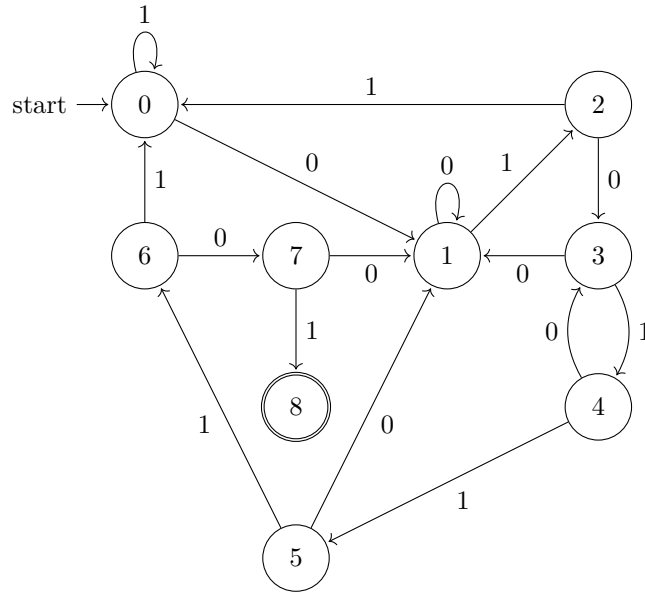
(b)



(c)

$f(1) = 0, \quad f(2) = 0,$
 $f(3) = 1, \quad f(4) = 2,$
 $f(5) = 0, \quad f(6) = 0,$
 $f(7) = 1, \quad f(8) = 2$

(d)



```
3. fn find_pattern(s: Vec<char>, p: Vec<char>, f: Vec<usize>) -> Option<usize> {
    let mut i = 0;
    let mut m = 0;
    while i < s.len() {
        if i - m == p.len() {
            return Some(m);
        }

        while s[i] != p[i - m] && i != m {
            m = i - f[i - m] + 1;
        }

        i += 1;
    }

    None
}
```