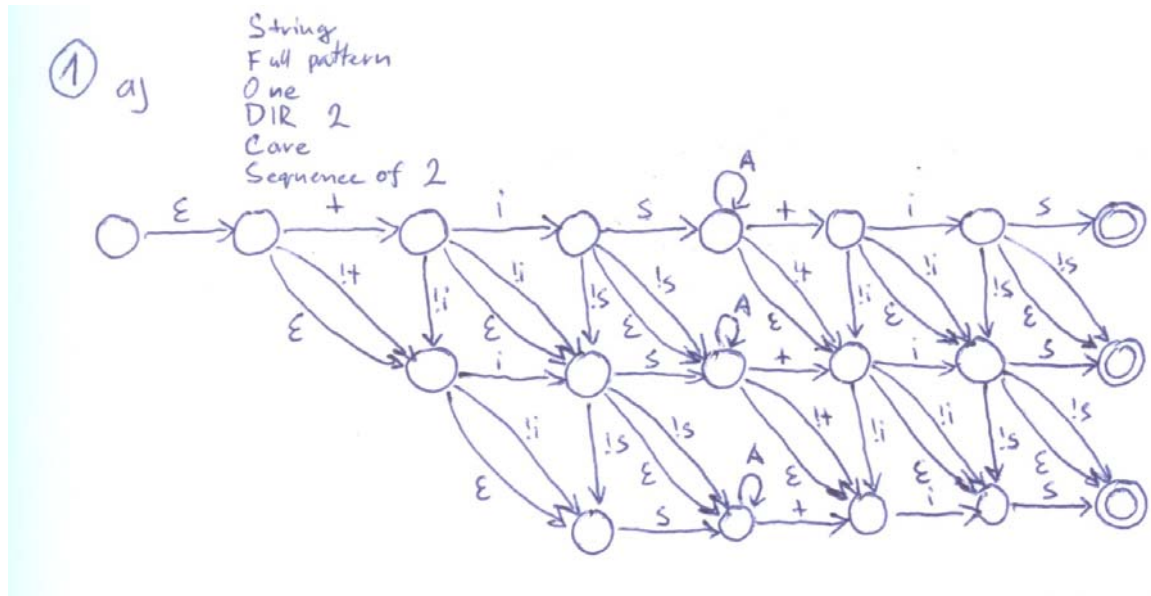


# Textové informační systémy 8.6.2007

1.

a)



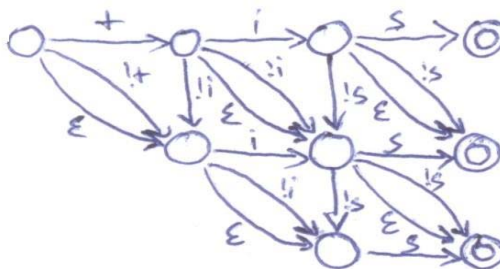
Automat najde 2 vyskyty vzorku s maximalne 2 chybami celkem.

b)

Odpověď: 9

b)

String  
Full pattern  
One  
DIR 2  
Cave  
One



### c)

Odpověď: 12

```
tenis
-----
tDD--
--DiD
--DDs
--Dis
tIIis
tRR--
--Ris
tRD--
--RiD
tDR--
--RDs
-IRis
```

## 2.

```
N = 22
beta (22) = 10110
beta' (22) = 0110
alfa ( | beta(22) | ) = alfa (5) = 00001
gamma (22) = 000101001

omega = B0.B1. ... Bk.0
Bk = beta (22) = 10110
Bk-1 = beta ( | Bk | - 1 ) = beta (4) = 100
Bk-2 = beta ( | Bk-1 | -1 ) = beta (2) = 10
| B0 | = 2 => Bk-2 == B0
omega = 10100101100
```

## 3.

Karp-Rabinovo vyhledavani - pouziti hashovaci funkce. Misto prikkladani vzorku k textu na vseh pozicich, kontroluje shodu jen tam, kde podretezec textu vypada "podobne". Podobnost urcuje hashovaci funkce. Hashovaci funkce by mela byt efektivne vycislitelna a mela by dobre separovat ruzne retezce. Vyhledavani je v nejhorsim pripade kvadraticke, ale prumerne  $O(T+V)$ .

**4.**

```
var TEXT: array[1..T] of char; VZOREK: char;

I := 1;
TEXT [T+1] := VZOREK;
while (TEXT[I] <> VZOREK) do
  begin
    if TEXT[I+1] = VZOREK then break;
    I := I+2;
  end;
FOUND := (I<T) OR (TEXT[T] = VZOREK);

vystup v promenne FOUND : ano/ne.
```

**5.**

**a)**

NE

**b)**

```
X = abcde;
Y = fghij;
R(X,Y) = 5;
DIR(X,Y) = 5;
DIRT(X,Y) = 5;
```

stale vyuziva pouze funkce R-Replace.

**c)**

```
T=(a^100).baaaaa
V=baaaaa
```

## 6.

6) a)  $R = 01^*(1+0)$

$$\frac{d01^*(1+0)}{d0} = \frac{d0}{d0} 1^*(1+0) = \underline{1^*(1+0)}$$

$$\frac{d01^*(1+0)}{d1} = \frac{d0}{d1} 1^*(1+0) = \underline{\emptyset}$$

$$\frac{d1^*(1+0)}{d0} = \frac{d1^*}{d0}(1+0) + \frac{d(1+0)}{d0} = \frac{d1}{d0} 1^*(1+0) + \frac{d1}{d0} + \frac{d0}{d0} = \underline{\epsilon}$$

$$\frac{d1^*(1+0)}{d1} = \frac{d1^*}{d1}(1+0) + \frac{d(1+0)}{d1} = \frac{d1}{d1} 1^*(1+0) + \frac{d1}{d1} + \frac{d0}{d1} = \underline{1^*(1+0) + \epsilon}$$

$$\frac{d1^*(1+0) + \epsilon}{d0} = \frac{d1^*(1+0)}{d0} + \frac{\epsilon}{d0} = \underline{\epsilon}$$

$$\frac{d1^*(1+0) + \epsilon}{d1} = \frac{d1^*(1+0)}{d1} + \frac{\epsilon}{d1} = \underline{1^*(1+0) + \epsilon}$$

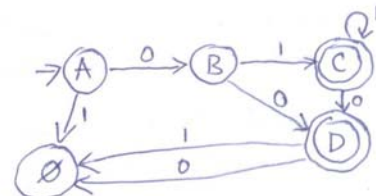
$$A \equiv 01^*(1+0)$$

$$B \equiv 1^*(1+0)$$

$$C \equiv 1^*(1+0) + \epsilon$$

$$D \equiv \epsilon$$

stavy C a D jsou koncové (obsahují  $\epsilon$ )



b)  $\left( \frac{\frac{dR}{d0}}{\frac{d1}{d0}} \right)$   $\frac{dR}{d0} = 1^*(1+0)$

$$\frac{d1^*(1+0)}{d1} = 1^*(1+0) + \epsilon$$

$$\frac{d1^*(1+0) + \epsilon}{d1} = 1^*(1+0) + \epsilon$$

$$\frac{d1^*(1+0) + \epsilon}{d0} = \epsilon$$

$$|T_M| = 3$$

01  
011  
0110

DKA najde v  $T = 0110$   
3. vzorku.  
výslyty

## 7.

$$G = (\{S\}, \{a, b\}, P, S)$$

$$P = \{ 0: S \rightarrow bS, \\ 1: S \rightarrow a, \\ 2: S \rightarrow bSS \}$$

0: bS  
0: bbS  
1: bba

2: bSS  
2: bbSSS  
2: bbbSSSS  
0: bbbbSSSS  
1: bbbbaSSS  
1: bbbbbaaSS  
1: bbbbbaaaS  
1: bbbbbaaaa