

# Øving 10 DM TDAT2005

①  $A = \{0, 1\}$   $B = \{11, 101\}$

a)  $AB = \{(0, 11), 111, 0101, 1101\}$

b)  $A \cup B = \{0, 1, 11, 101\}$

c)  $A \cup A^3 = \{0, 1, 000, 001, 010, 100, 011, 101, 110, 111\}$

d)  $B^2 A = \{11110, 11111,$

$111010, 111011,$

$101110, 101111\}$

e)  $B(A \cup B)A = \{1100, 1101,$

$1110, 1111,$

$11110, 11111,$

$111010, 111011,$

$10100, 10101,$

$10110, 10111,$

$101100, 101101\}$

②  $\Sigma = \{a, b\}$

det regnlore uttrykket  $(b + ab)^* (a + ab)^*$

bestemmer et språk over kun a og b hvor det ikke kan være flere sammenheng under a, og deretter flere sammenheng under b

ekse. (abaaaabb, aabb, abbaaabbbb) osv. går IKKE

③  $0^*(10^*)^*$  gir f.eks. 010, 000, 111, 101

1)  $(1^*0)^*1^*$  gir samme språk som ⑤

2) og 3) gir ikke samme språk utom  
struktur med kun 1 (11, 1111) er  
ikke gyldig.

④ gir  $T = \{ 0, 1, 2, 3, 4, 5, 6, 7, 8, 9 \}$

$$M = \{ \emptyset, \cdot^{-1} \}$$

$$K = \{ \emptyset, \cdot^+ \}$$

da får vi

$$(MT \mid T)T^* (KT \mid T)T^*$$

⑤  $((ba)(ab^*)) \mid ((ab^*) \mid b)(a)$



$(baab^*) \mid (ab^* \mid b)a$

$baab^* \mid (ab^* \mid b)a$

```

package sving_10;

import static hjelp.ColorPrint.println_Color;
import static hjelp.ColorPrint.string_Color;

import java.util.regex.Pattern;

public class oppgave6
{
    public static void main(String[] args)
    {
        println_Color( color: "blue" , tekst: "\na) inneholder et siffer");
        System.out.println( regex( regex: ".*\d.*" , test: "ab3"));
        System.out.println( regex( regex: ".*\d.*" , test: "abc"));

        println_Color( color: "blue" , tekst: "\nb) har datoformatet DD/MM/YYYY");
        System.out.println( regex( regex: "\d{2}/\d{2}/\d{4}" , test: "25/05/1997"));
        System.out.println( regex( regex: "\d{2}/\d{2}/\d{4}" , test: "21/5/1997"));

        println_Color( color: "blue" , tekst: "\nc) har minst 10 tegn");
        System.out.println( regex( regex: ".{10}.*" , test: "12345678910"));
        System.out.println( regex( regex: ".{10}.*" , test: "123456789"));

        println_Color( color: "blue" , tekst: "\nd) Inneholder andre tegn enn bokstaver");
        System.out.println( regex( regex: ".*\W.*" , test: "abc 123"));
        System.out.println( regex( regex: ".*\W.*" , test: "abc123"));
    }
}

```

```

private static String regex(String regex , String test)
{
    Pattern pattern = Pattern.compile(regex);
    String result = test + "\t matches " + "\t" + regex + "\t?\t";

    if(pattern.matcher(test).matches())
    {
        result += string_Color( color: "green" , tekst: "YES");
    }
    else
    {
        result += string_Color( color: "red" , tekst: "NO");
    }
    return result;
}

```

### a) inneholder et siffer

ab3	matches	.*\d.*	?	YES
abc	matches	.*\d.*	?	NO

### b) har datoformatet DD/MM/YYYY

25/05/1997	matches	\d{2}/\d{2}/\d{4}	?	YES
21/5/1997	matches	\d{2}/\d{2}/\d{4}	?	NO

### c) har minst 10 tegn

12345678910	matches	.{10}.*	?	YES
123456789	matches	.{10}.*	?	NO

### d) Inneholder andre tegn enn bokstaver

abc 123	matches	.*\W.*	?	YES
abc123	matches	.*\W.*	?	NO

Process finished with exit code 0

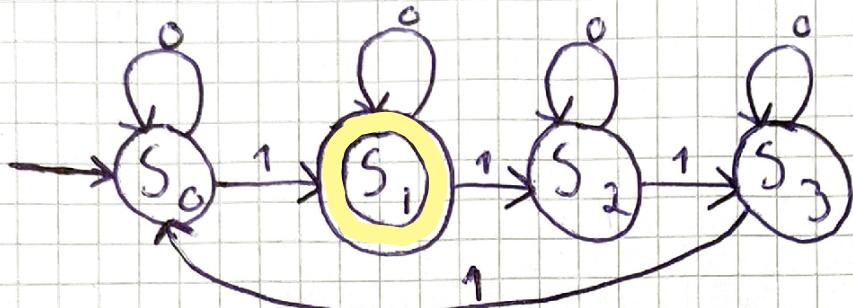
7)

a) inputset = {0, 1}

tilstandsmengde = { $s_0, s_1, s_2, s_3$ }

initialtilstand =  $s_0$

akseptertilstand =  $s_1$

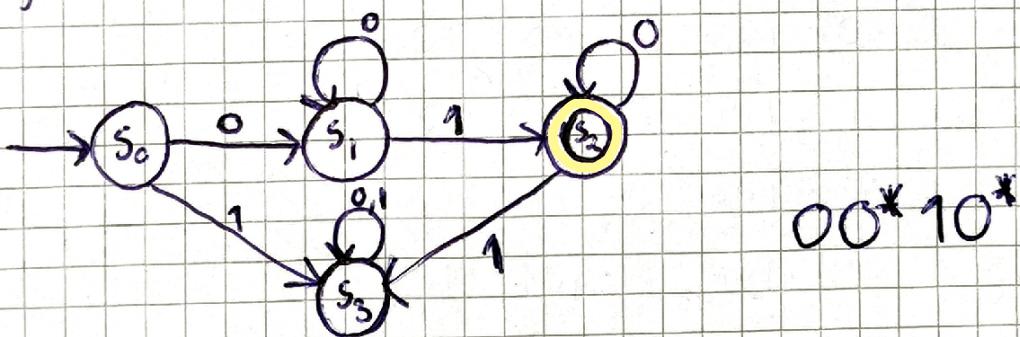


b)  $0^* 1 0^* (10^* 10^* 10^* 10^*)^*$

akseptere alle binære tall med  $1+4n$  antall  
1'er (1, 5, 9, 13 osv.)

8)

a)  $\Sigma = \{0, 1\}$



b)  $\Sigma = \{a, b\}$

