Waiting Queue

Zeit 0   10   20   30   40   50   60   70

K1   1   4   6   9   12   14

K2   2   5   7   11   13

K3   3   8   10

On the Post Correspondence Problem

x_0 x_1

y_0 y_1

x_0 x_0 x_0 x_0 x_0 x_1 x_1 x_1

y_0 y_0 y_0 y_0 y_0 y_1 y_1 y_1
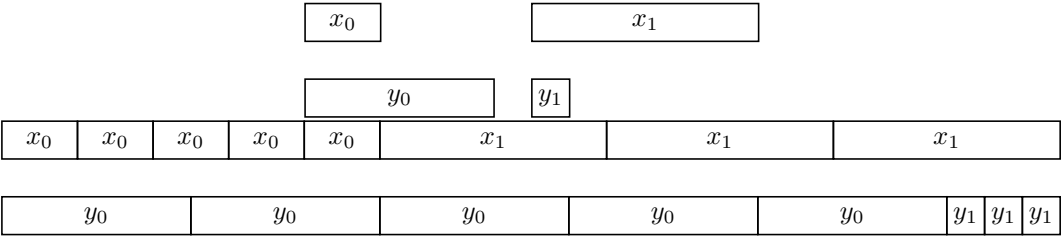
On the Halting Problem

M'

Hält nicht

M

σ_1 σ_2 $\cdots$ σ_n q_{ja}
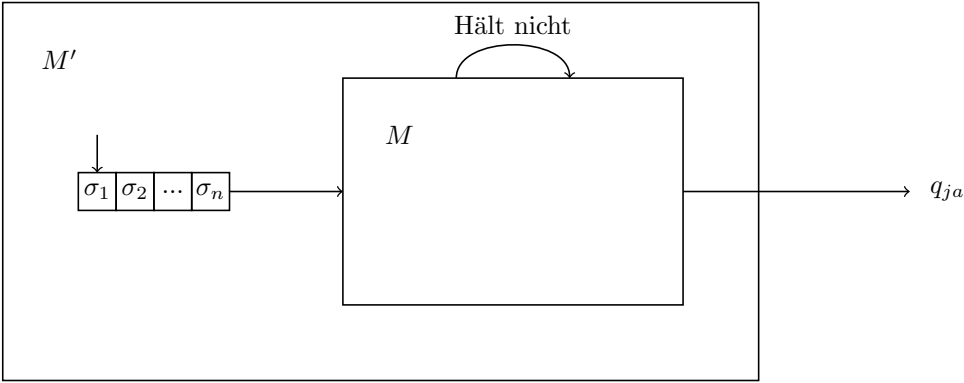
Triangulation of a Triangle

Q

$\triangle(Q, R, T)$

$\triangle(T, R, Q)$ T $\triangle(P, Q, R)$

R

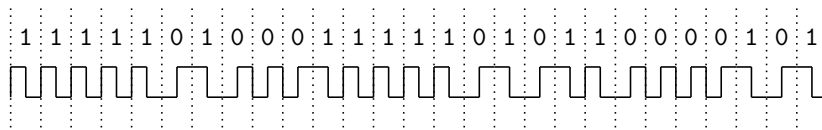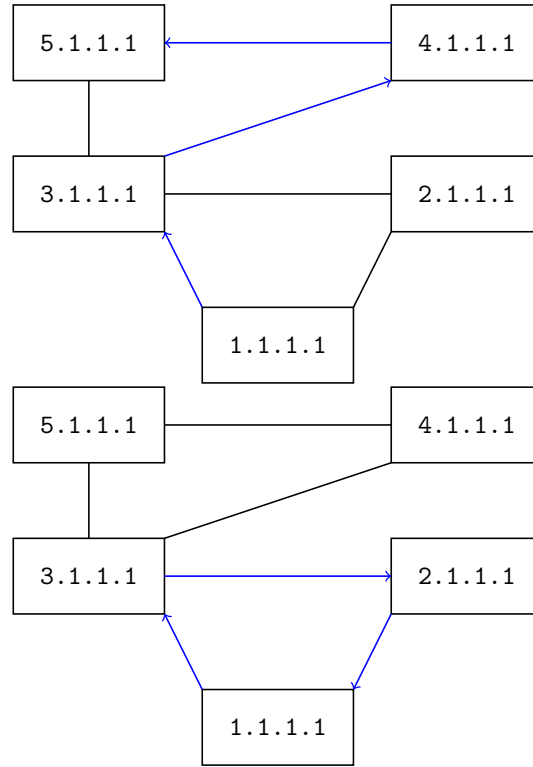P $\triangle(P, T, R)$

1
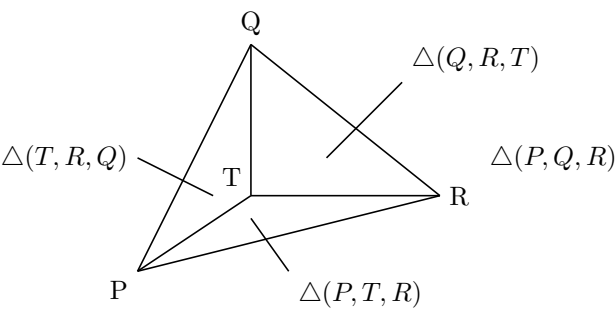
Matrices

$$C = \left(\begin{array}{ccc|ccc|c}
a_{11} & \cdots & * & * & \cdots & * & \\
\vdots & \ddots & \vdots & \vdots & & \vdots & \\
0 & \cdots & a_{rr} & * & \cdots & * & \\
\hline
0 & \cdots & 0 & 0 & \cdots & 0 & \\
\vdots & & \vdots & \vdots & & \vdots & \\
0 & \cdots & 0 & 0 & \cdots & 0 & \\
\hline
& & & & & &
\end{array} \right)$$

$$C' = \left(\begin{array}{cccccc|ccc}
a_{11} & \cdots & \cdots & \cdots & \cdots & * & * & \cdots & * \\
\vdots & \ddots & & & & \vdots & \vdots & & \vdots \\
\vdots & & a_{rr} & & & \vdots & \vdots & & \vdots \\
\vdots & & & b_{11} & & \vdots & \vdots & & \vdots \\
\vdots & & & & \ddots & \vdots & \vdots & & \vdots \\
0 & \cdots & \cdots & \cdots & \cdots & b_{ss} & * & \cdots & * \\
\hline
0 & \cdots & \cdots & \cdots & \cdots & 0 & 0 & \cdots & 0 \\
\vdots & & & & & \vdots & \vdots & & \vdots \\
0 & \cdots & \cdots & \cdots & \cdots & 0 & 0 & \cdots & 0
\end{array} \right)$$

Manchester Encoding

1 1 1 1 1 0 1 0 0 0 1 1 1 1 1 0 1 0 1 1 0 0 0 0 0 1 0 1

Network Package Routing

```
┌───────────┐                    ┌───────────┐
│  5.1.1.1  │ ◄───────────────── │  4.1.1.1  │
└───────────┘                    └───────────┘

┌───────────┐                    ┌───────────┐
│  3.1.1.1  │ ──────────────────── │  2.1.1.1  │
└───────────┘                    └───────────┘

            ┌───────────┐
            │  1.1.1.1  │
            └───────────┘

┌───────────┐                    ┌───────────┐
│  5.1.1.1  │ ──────────────────── │  4.1.1.1  │
└───────────┘                    └───────────┘

┌───────────┐                    ┌───────────┐
│  3.1.1.1  │ ──────────────────► │  2.1.1.1  │
└───────────┘                    └───────────┘

            ┌───────────┐
            │  1.1.1.1  │
            └───────────┘
```

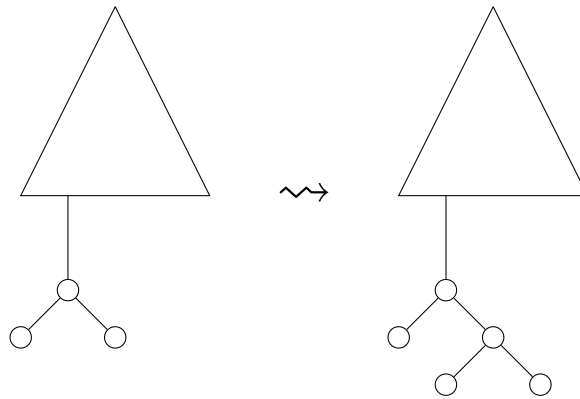**Swapping Algorithm Description**

Algorithm 1 Swapping values

1: **procedure** SWAP(a, b)
2:     $t \leftarrow a$
3:     $a \leftarrow b$
4:     $b \leftarrow t$

Binary Trees

Skip List

$h = 6$ ○ — — — — — — — 8 ⊢

$h = 5$ ○ — — — — — — — 8 ⊢

$h = 4$ ○ — — — — 5 — — 8 ⊢

$h = 3$ ○ — — — 5 → 6 → 8 ⊢

$h = 2$ ○ — 3 → 5 → 6 → 8 ⊢

$h = 1$ ○ → 1 → 3 → 5 → 6 → 8 → 9 → 10 ⊢
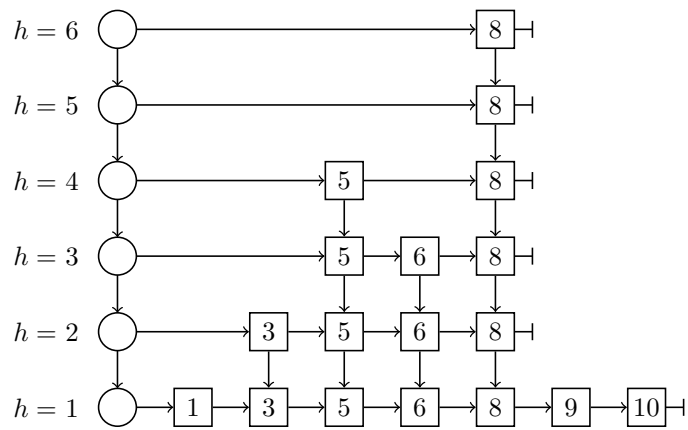
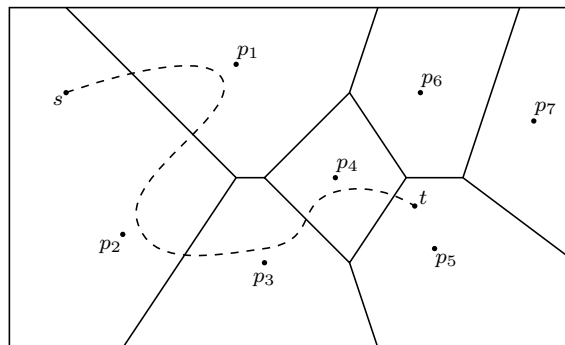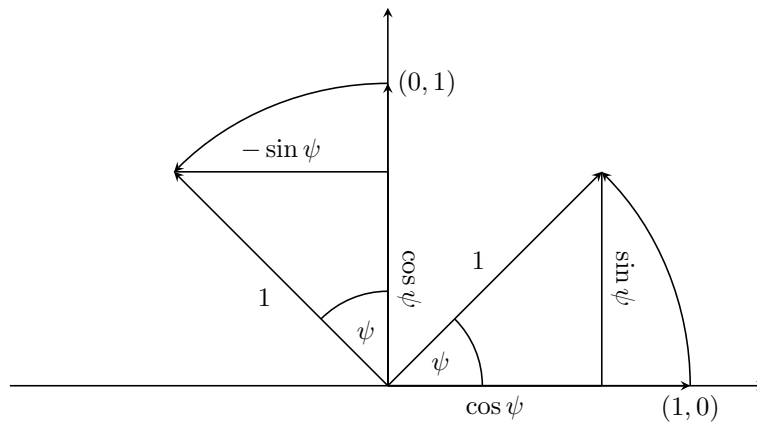## Countinuous First Neighbors

4

Rotation in der Ebene

$$\begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} x \\ 0 \end{pmatrix} + \begin{pmatrix} 0 \\ y \end{pmatrix} \mapsto \begin{pmatrix} \cos(\psi) \cdot x - \sin(\psi) \cdot y \\ \sin(\psi) \cdot x + \cos(\psi) \cdot y \end{pmatrix}$$

Three-dimensional Borel Sets

$[0,2]^3$

A_1

$[0,2]^3$

$\overline{A_2}$

$[0,2]^3$

A_3

$[0,2]^3$

A_4