

Aufgabe 1

a) $V = \{S, A\}$

$$R = \{S ::= \{A\{c\}d \uparrow aSdd\}, A ::= \{ab \uparrow aAb\}\}$$

b)
$$f(p) = \begin{pmatrix} f(p)(X) \\ f(p)(Y) \end{pmatrix} = \begin{pmatrix} \{\epsilon\} \cup \{a\} \circ p(Y) \\ p(X) \circ \{b, b^2\} \end{pmatrix}$$

$$\begin{pmatrix} \emptyset \\ \emptyset \end{pmatrix} \rightarrow \begin{pmatrix} \{\epsilon\} \\ \emptyset \end{pmatrix} \rightarrow \begin{pmatrix} \{\epsilon\} \\ \{b, b^2\} \end{pmatrix} \rightarrow \begin{pmatrix} \{\epsilon, ab, ab^2\} \\ \{b, b^2\} \end{pmatrix} \rightarrow \begin{pmatrix} \{\epsilon, ab, ab^2\} \\ \{b, b^2, ab^2, ab^3, ab^4\} \end{pmatrix} \\ \rightarrow \begin{pmatrix} \{\epsilon, ab, ab^2, a^2b^2, a^2b^3, a^2b^4\} \\ \{b, b^2, ab^2, ab^3, ab^4\} \end{pmatrix}$$

c) $w(\epsilon) = \{a^n b^m \mid n \geq 0, n \leq m \leq 2n\}$

Aufgabe 2

→ als C-File

Aufgabe 3

$$\begin{array}{cccccc} 2 & 1 & \boxed{3} & 6 & 5 & 4 \\ \uparrow & & & & & \uparrow \\ 2 & 1 & \boxed{3} & 6 & 5 & 4 \\ & & \uparrow & & & \\ & & \uparrow & & & \\ 2 & 1 & \boxed{3} & 6 & 5 & 4 \\ & \uparrow & & \uparrow & & \\ & \uparrow & & \uparrow & & \end{array}$$

$$\begin{array}{cccccc} \boxed{2} & 1 & 3 & 6 & \boxed{5} & 4 \\ \uparrow & \uparrow & & \uparrow & \uparrow & \uparrow \\ 1 & \boxed{2} & 3 & 4 & \boxed{5} & 6 \\ \uparrow & \uparrow & & \uparrow & \uparrow & \uparrow \\ 1, 2, 3 & & & 4 & & 5, 6 \end{array}$$

$$1, 2, 3, 4, 5, 6$$