# 形式语言与自动机

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| | | |
|---|---|---|
| DFA | 五元组$\{Q,\Sigma,\delta,q_0,F\}$ | $q_0\in Q,F\subseteq Q,\delta:Q\times\Sigma\to Q$ |
| NFA | 五元组$\{Q,\Sigma\cup\{\epsilon\},\delta,q_0,F\}$ | $q_0\in Q,F\subseteq Q,\delta:Q\times\Sigma\cup\{\epsilon\}\to 2^Q$ |
| 文法 | 四元组$\{V,T,S,P\}$ | Variant、Terminant、Start、Production,$V\cap T=\emptyset$ |
| PDA | 七元组$\{Q,\Sigma,\Gamma,\delta,q_0,Z_0,F\}$ | $\Sigma$输入符号，$\Gamma$栈符号，$\delta:Q\times(\Sigma\cup\{\epsilon\})\times\Gamma\to 2^{Q\times\Gamma^*}$ |
| 空栈型PDA | 六元组$\{Q,\Sigma,\Gamma,\delta,q_0,Z_0\}$ | $\Sigma$输入符号，$\Gamma$栈符号，$\delta:Q\times(\Sigma\cup\{\epsilon\})\times\Gamma\to 2^{Q\times\Gamma^*}$ |
| 图灵机 | 七元组$\{Q,\Sigma,\Gamma,\delta,q_0,B,F\}$ | $\Sigma\subset\Gamma,B\in\Gamma-\Sigma,\delta:Q\times\Gamma\to Q\times\Gamma\times\{L,R\}$ |

NFA转DFA：

## NFA 转换 DFA 的算法

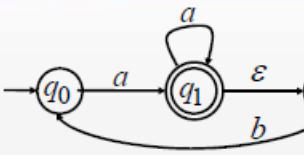
2. 对DFA中的状态$[q_i, q_j, \dots, q_m]$，如果在NFA中存在如下迁移：

$$\left.\begin{array}{l}\delta^*(q_i, a),\\ \delta^*(q_j, a),\\ \dots\end{array}\right\} = \{q_i', q_j', \dots, q_m'\}$$

则在DFA中添加迁移：$\delta([q_i q_j \dots q_m],\ a) = [q_i' q_j' \dots q_m']$

## 例

NFA $M$




DFA $M'$