Formal Languages and Compilers

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- Review of material from the previous lectures

- Variants of finite automata

- Exercises

- Extra exercise for home - 0.5 point when completed and send to me today

- **Next week, same time and place as lecture**

- **You can get up to 20 point**

- **Topics: all lectures including this one**

- **Name phases of compilation process**

- **What are inputs and outputs of compilers?**

- **Which phases are mandatory and which optional?**

- **What is a lexem and a token? Are those the same thing?**

$L_1 = \{\epsilon\}, L_2 = \emptyset$

- $L_1 == L_2$**?**
- **card(**L_1**) =**
- **card(**L_2**) =**
- $L_1 L_2$ **=**
- $L_1\{a\}$ **=**
- $L_2\{a\}$ **=**

$L_1 = \{\epsilon\}, L_2 = \emptyset$

- $L_1 == L_2$? **No.**

- **card(L_1) = 1**

- **card(L_2) = 0**

- $L_1 L_2 = \emptyset$

- $L_1\{a\} = \{a\}$

- $L_2\{a\} = \emptyset$

- **What is a regular expression?**

- **What is a finite automata?**

- **Can we convert all regular expressions into a finite automata? Give an example if not.**

- **Create an regular expression for $L = \{x: aa$ is substring of $x\}$ over $\Sigma = \{a, b\}$**

- **Create an finite automata for regular expression $0(10)^*1$**
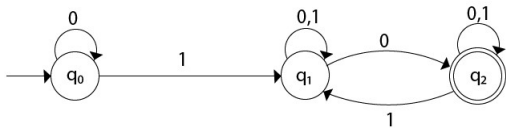
Variants of finite automata slides
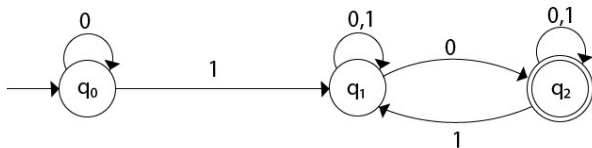
Convert the following NFA with ε to NFA without ε.
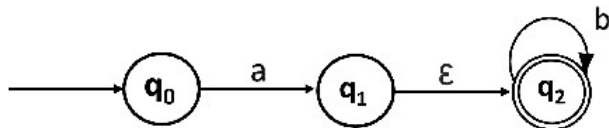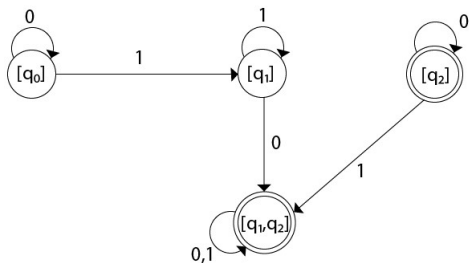
Convert the following NFA with ε to NFA without ε.
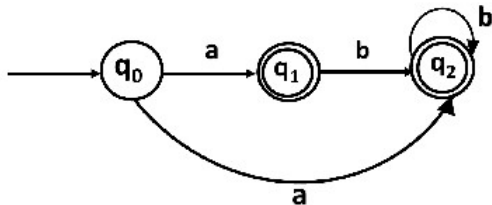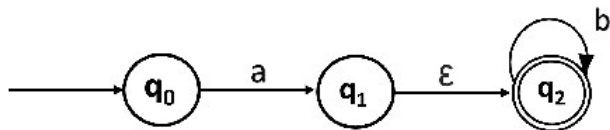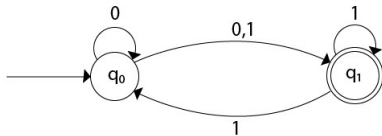
Convert the given NFA to DFA.
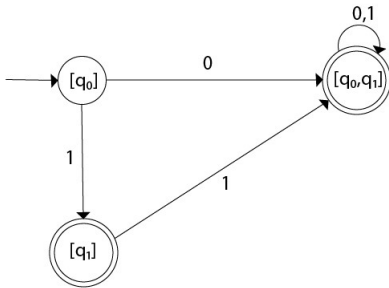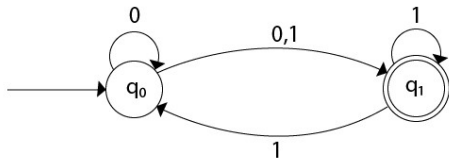
Convert the given NFA to DFA.

The Transition diagram will be:

Convert the given NFA to DFA.

Convert the given NFA to DFA.

- Solve till today's midnight

- Send your solution to iregeciova@fit.vutbr.cz

- You can get 0.5 points for correct and nice solution (short answer does not count!)

- Extra points does not count into credit and course minimum

- **Exercise**: **Create an regular expression for** $L = \{$**x: aa is not substring of x**$\}$ **over** $\Sigma = \{a, b\}$

Thank you for your attention