Module 2 Overview

Regular Languages (Chapter 1)

Module Intro

The theory of computation begins with a question: What is a computer? It is perhaps a silly question, as everyone knows that this thing I type on is a computer. But these real computers are quite complicated—too much so to allow us to set up a manageable mathematical theory of them directly. Instead, we use an idealized computer called a computational model. As with any model in science, a computational model may be accurate in some ways but perhaps not in others. Thus we will use several different computational models, depending on the features we want to focus on. We begin with the simplest model, called the finite state machine or finite automaton.

Objectives

Upon completion of this module, students will be able to:

1. Define a language
2. Define a string
3. Define and create a DFA for given languages
4. Define and create an NFA for given languages
5. Define and create regular expressions for given languages
6. Construct an NFA from a regular expression
7. Define what it means for a language to be closed under an operation on that language
8. Perform operations: union, concatenation, and star, on a regular languages

9. Use the pumping lemma to determine that a language is not regular

Readings and Resources

You can explore this module's information in multiple ways:

- View slides
- Access this information from the textbook (**Chapter 1)** **Course Textbook (https://virginiacommonwealth.instructure.com/courses/119232/pages/course-textbook)**
- Solve practice activities

Module at a Glance

Below is an overview of this module. Pay particular attention to items with **points values** and **due dates,** as these are graded assignments. (Note: module overview will not display if you are accessing Canvas on a mobile device.)

Module 2: Regular Languages (Chapter 1)

- **Module 2 Overview: Regular Languages (Chapter 1)**
- **M2 Chapter 1: Notes - DFA 1.1**
  - **Automata Creator for DFA**
  - **M2: 1.1 Practice**
    0 pts
- **M2 Chapter 1 Notes - Regular Expressions (1) 1.2**
  - **Key for Classwork on Deterministic Finite Automata**

M2: 1.2 Practice
0 pts

M2 Chapter 1: Notes - NFA 1.3

Automata Creator for NFA

M2: 1.3 Practice
0 pts

M2: Challenge Problem Set
0 pts

M2 Chapter 1 Notes - Regular Expressions (2) 1.4

Key for Classwork on Nondeterministic Finite Automata And Regular Expressions Exercise

M2: 1.4 Practice
0 pts

Regular Expression Tutorial

M2 Chapter 1 Notes - Regular Expressions (3) 1.5

M2: 1.5 Practice
0 pts

M2 Chapter 1: Notes - Pumping Lemma 1.6

M2: 1.6 Practice
0 pts

M2: Challenge Problem Set 2
0 pts

M2 Chapter 1 Review Key

Reflection 2 - Exam 1

Sep 28, 2025, 11:59 PM 10 pts This assignment was locked Sep 29 at 11:59pm.