NEW

Introduction to USACO & AI assisted Programming

Instructor: Xintian Yu

The course is designed for students who are new to competitive programming and are interested in preparing for the USACO (USA Computing Olympiad) contests. This introductory course focuses on teaching foundational programming concepts, problem-solving skills, and basic algorithms essential for success in the USACO Bronze Division. By the end of the course, students should have a strong foundation in basic algorithms and data structures. This will prepare them for progression to higher levels (Silver and above).

The course also aims to develop problem-solving skills applicable in various programming contexts beyond competitive programming. AI tools will be utilized to support students by reviewing code submissions in real time, providing immediate feedback on errors and inefficiencies, offering hints and guiding students step-by-step through complex problems.

Prerequisites: Knowledge of a programming language such as Python, Java or C++ is required. Java will be mainly used in the course.

The course typically covers the following topics

1. Fundamental Data Structures:

- Arrays, lists, and basic usage of sets and maps.
- Understanding data storage and retrieval to solve problems efficiently.

2. Problem-Solving Techniques:

- Basic algorithms and techniques including sorting, searching, and brute-force methods.
- Introduction to greedy algorithms and the two-pointer technique.
- Debugging and testing strategies.

3. Working with Input/Output (I/O):

- Techniques for handling large inputs and outputs in competitive programming.
- Reading from files and managing output for USACO-style problems.

4. Bronze-Level Topics and USACO-Style Problems:

- Simple simulations and implementations.
- Introduction to ad-hoc problems, which require creative thinking rather than standard algorithms.
- Solving USACO Bronze-level problems and mock contests to build confidence.

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USACO 和 AI 辅助编程简介

讲员：俞新天

本课程专为刚接触竞技编程并有兴趣为 USACO（美国计算机奥林匹克）比赛做准备的学生而设计。这门入门课程侧重于教授基础编程概念、解决问题的技能和在 USACO 铜牌组取得成功所必需的基本算法。到课程结束时，学生应该在基本算法和数据结构方面打下坚实的基础。这将为他们进入更高水平（银牌及以上）做好准备。

本课程还旨在培养适用于竞技编程以外的各种编程环境的解决问题的技能。人工智能工具将用于支持学生，实时审查代码提交，立即反馈错误和低效之处，提供提示并逐步指导学生解决复杂问题。

先决条件：需要了解 Python、Java 或 C++ 等编程语言。本课程主要使用 Java。

该课程通常涵盖以下主题

- 基本数据结构：
- 数组、列表以及集合和映射的基本用法。
- 了解数据存储和检索以有效解决问题。
- 问题解决技术：
- 基本算法和技术，包括排序、搜索和强力方法。
- 算法和双指针技术简介。
- 调试和测试策略。
- 使用输入/输出 (I/O)：
- 处理竞技编程中大量输入和输出的技术。
- 读取文件并管理 USACO 风格问题的输出。
- 青铜级主题和 USACO 风格问题：
- 简单的模拟和实现。
- 介绍临时问题，这些问题需要创造性思维而不是标准算法。
- 解决 USACO 青铜级问题和模拟竞赛以建立信心。