

WELCOME TO THE ERINDALE COMPUTER SCIENCE CLUB

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What is Competitive Programming?

Mind sport like chess.

Solves computational problem under constraints.

Generates requires participants program.

Contests

Beaver Computing Contests

CCC Series

ECOO Series

DMPG

Woburn Challenge Series (idk if they're gonna continue)

Many, many, many online contests.

Beaver Computing Contest

Hosted by CEMC (Waterloo Uni)

No past programming experience required.

Gr 9 and 10

3 part multiple choice on a school computer.

Weeks of Nov 4 and Nov 11

Registration deadline: October 23rd

CCC Series

Arguably the most important contest

Hosted by Waterloo

Two Divisions Junior/Senior

5 problems for each division worth 15 pts each

Around top 20-30 get invited to CCO

Sometime in February

ECOO Series

Team Competition

Out of school competition

Teams of 4 people

4-5 problems

3 stages (Boardwide, Regional, Provincial)

Top teams win money at Provincials

Boardwide starting in April

DMPG

Can work with a pair or solo

Out of school competition

3 Divisions (Bronze, Silver, Gold)

6 problems

Sometime in May

Online Contests

There's lots, lots and lots.
Write at home.

On an online judge (website)

Example: DMOJ, Codeforces.

Archives of thousands of problems.



Basics of Competitive Programming

Given a problem (similar to a math contest problem)

Write a program that takes the problem variables as input, and output the correct answer

Multiple test cases for each problem with different variable values each time

Example

Problem statement:

A and B are two integers with $0 \leq A, B \leq 100$.

Given the value of A and B, output A+B.

```
1  int A, B;    #define the variable you will use
2
3  input(A);    #take the variable as input
4  input(B);
5
6  print(A + B); #output the sum
```

Example Problem

Your friend is thinking of an integer between 1 and 63 (inclusive).

They offer to give you money if you guess the integer are thinking of.

Every guess will tell you whether your guess was above or below the integer they were thinking of.

Find a strategy that uses the minimum number of guesses before you know the answer with certainty.

DMOJ

Online judge with many
practice problems
(including past contests)

Monthly online contests

The screenshot shows the DMOJ Online Judge interface. At the top, there's a navigation bar with links for PROBLEMS, SUBMISSIONS, USERS, CONTESTS, and ABOUT. A user profile for 'Hello, Ethan_Pronev.' is visible on the right. Below the navigation bar, the 'Problems' section is active, displaying a table of problems. The table has columns for Problem, Category, Types, Points, AC %, and Users. A search sidebar on the right includes a search bar, checkboxes for 'Full text search', 'Hide solved problems', and 'Show problem types', a 'Category' dropdown, a 'Problem types' filter, a 'Point range' slider, and a 'Hot problems' section listing recent contests.

✓	Problem	Category	Types	Points	AC %	Users
⊖	16 BIT S/W ONLY	Uncategorized	Simple Math	3	36.3%	825
⊖	3-Dimensional Connect 4	Uncategorized	Implementation, String Algorithms	5	20.5%	48
⊖	Rotations in 3 Dimensions	Fun Math	Geometry	12	32.0%	68
⊖	4Ever	Uncategorized	Intermediate Math, String Algorithms	7	17.4%	76
⊖	A20 Gate	Uncategorized	Implementation	5	33.6%	116
⊖	Another Contest 1 Problem 1 - Binary String Operations	Uncategorized	Data Structures	25	8.2%	24
⊖	Another Contest 1 Problem 2 - Graphs	Uncategorized	Graph Theory	15	7.6%	42
⊖	Another Contest 1 Problem 3 - Poutine	Uncategorized	Greedy Algorithms	10	7.8%	47
⊖	Another Contest 2 Problem 1 - Poutine	Uncategorized	Dynamic Programming, Graph Theory	15	12.5%	60
⊖	Another Contest 2 Problem 2 - Poutine	Uncategorized	Graph Theory	10	29.2%	53
⊖	Another Contest 2 Problem 3 - Poutine	Uncategorized	Data Structures, Graph Theory	15	22.8%	47
⊖	Another Contest 3 Problem 1 - Diverse Arrays	Uncategorized	Greedy Algorithms	7	18.0%	120
⊖	Another Contest 3 Problem 2 - Camelot	Uncategorized	Advanced Math	15	13.1%	41
⊖	Another Contest 3 Problem 3 - Lexicographically	Uncategorized	Greedy Algorithms	7	16.9%	45

Problem search

Search problems...

☐ Full text search
☐ Hide solved problems
☒ Show problem types

Category: All

Problem types: Filter by type...

Point range: 1 to 50

Go Random

Hot problems

COCI '14 Contest 2 #2 Utrika
IOI '01 P1 - Mobile Phones
DMOJC '16 Contest 1 P5 - Blood Tubes

DMOJ

- Go to dmoj.ca
- Create an account
- Join Erindale S.S. Organization
- Submit to the problem titled "Hello, World!"

The screenshot shows the DMOJ homepage. The navigation bar at the top includes links for PROBLEMS, SUBMISSIONS, USERS, CONTESTS, and ABOUT. The 'Login' and 'Register' links are circled in red. A red arrow points to the 'Hello, World!' problem mentioned in the instructions. The main content area features a welcome message, a news section for the 'DMOPC '19 September Contest', and a sidebar with ongoing and upcoming contests.

Welcome to the DMOJ: Modern Online Judge!

The DMOJ is a modern contest platform and archive of programming problems. It's also entirely [open source](#).
So far, **38005** developers have submitted to **2282** problems a total of **1548520** times, using **67** languages.
If this is your first visit, please [register](#) an account. Then, try the [Hello, World!](#) problem.

News

DMOPC '19 September Contest
[george_chen](#), [little_prince](#), [KevinWan](#) posted 6 days ago

From Friday, September 13th to Sunday, September 15th, we'll be hosting the September DMOJ Monthly Open Programming Contest!

DMOPC DMOJ Monthly Open Programming Contest

Anyone with a DMOJ account is welcome to participate, and anyone without one is welcome to register and participate.
Contestants may participate in any 3-hour window between 0:00 am EDT of Sept. 13th and 0:00 am EST of Sept. 16th. Please see the [rules](#).

Ongoing contests

2019 International Olympiad in Informatics Day 1 (Mirror)
Ends in 8 days 02:32:26.

Upcoming contests

DMOPC '19 September Contest
Starting in 02:32:26.

Comment stream

slack 6/776

[tzak_el](#) → COCI '08 Contest 6 #4 Cuskija
[Narcariel](#) → Back To School '19: Chemistry

The screenshot shows the 'Problems' page on DMOJ. The 'PROBLEMS' link in the navigation bar is circled in red. A table lists various problems with columns for Problem, Category, Points, AC %, and Users. On the right, the 'Problem search' section has a search bar with 'Search problems' entered, which is also circled in red. Below the search bar are checkboxes for 'Full text search' and 'Show problem types', a 'Category' dropdown, and a 'Point range' slider. At the bottom right, there is a 'Hot problems' section.

Problems

Problem	Category	Points	AC %	Users
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Problem search

Search problems

☐ Full text search
☐ Show problem types

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Point range: 1 to 50

Go Random

Hot problems

[Binary Indexed Tree Test](#)
[CCC '19 J3 - Cold Compress](#)
[COCI '14 Contest 2 #2 Utrka](#)

Extra Practice

If you want to practice submitting to dmoj, you can try the following problems.

- [A Plus B](#)
- [CCC '13 J1 - Next in line](#)
- [CCC '14 J1 - Triangle Times](#)

Temporary outline

- What is competitive programming
- Classroom code
- Intro to contests that the club will do
 - What a contest problem looks like (statement & solution)
- Logic riddles (maybe past beaver prob)
- Teach how to output
- DMOJ - how to sign up and submit, etc.
- Submit to Hello, World!
- Hw - other easy problems to practice i/o