



LECTURE 0

INTRODUCTION

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BOSTON
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Introduction

Course Staff



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Course Webpage

<https://www.howchenn.com/teaching/>

All materials will be posted here

Class Piazza

All announcements will be made here

Ask questions either publicly or privately.

Recommended Materials

Instructors' Favorite:

Competitive Programmer's Handbook

<https://cses.fi/book/book.pdf>

Classics:

Introduction to Algorithms (CLRS)

Algorithm Design (Kleinberg)

Prerequisite Knowledge

Basic Understanding of Algorithms and Data Structure
(CS330, EC330, CS112) * But Not Required To Enjoy the Course

Course Structure

Graded on **Attendance** (90%) and **Participation** in class contest (10%) (3 questions)

A 50 minutes class, we will focus on "solving" in class and there will be resources with detailed explanations of the algorithms for further understanding

Course Outline

- Basic Concepts

- C++, Vim, Efficiency

- Useful Algorithms and Reduction Concepts

- Maxflow, Spanning Tree, Graph, DP, String

- Advanced Algorithms

- Convex Hull, FFT

Vim Wizardry

Choice of Text Editor

Why?

Fast once you get the hang of it

Flexible for Personal Configuration and very powerful

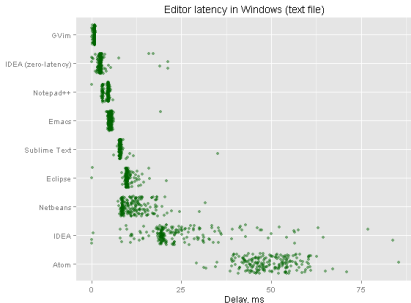
IDE?

Good for developing software

Overkill (Features), too slow for fast problem solving

Which one to use?

Up to you!



Modes

Command Mode: *hEsci*

Insert Mode:

i	enter insert mode
I	move cursor to the front of the line and insert mode
A	("append") to the end of the line
O	("open") a line ABOVE
o	("open") a line below

Syntax

"diw" deletes the word on the cursor

Verb	d	delete	Noun	iw	in word
	c	change		ip	in paragraph
	y	yank		it	in tag (HTML)
	>	indent		i"	in quote
	v	visual		...	in something

Movement



w move by a word

b move "back" by a word

combine moves with number: Ex) 5j to go 5 lines down

gg to go to top, G to go to bottom

Command line

While in command mode, use ":" to issue a specific vim command.

:5	jump to line 5
:r "path-to-file"	paste a textfile
:w	save
:q	quit
:q!	force quit (if you don't save)
:wq	save and quit

Configuration

.vimrc is very powerful, you can install plugins, set compiler options etc...

Make sure you have GCC compiler installed (sudo apt-get install build-essential)

Create a configuration file .vimrc in home directory.

Add the following lines to toggle relative numbering

```
augroup numbertoggle
  autocmd!
  autocmd BufEnter,FocusGained,InsertLeave * set rnu
  autocmd BufLeave,FocusLost,InsertEnter * set nornu
augroup END
```

Add the following lines to your `.vimrc` for fast compilation and execution

(Compile and Run)

```
autocmd filetype cpp noremap <F8> :w <bar> !g++  
-std=c++17 -Wshadow -Wall % -o %:~ -O2  
-Wno-unused-result && ./%:~ <CR>
```

(Check previous output)

```
autocmd filetype cpp noremap <F9> :!%:~ <CR>
```

You're set!

hOptional **My full setting:**

<https://github.com/du00d/competitive-programming/blob/master/vim/.vimrc>