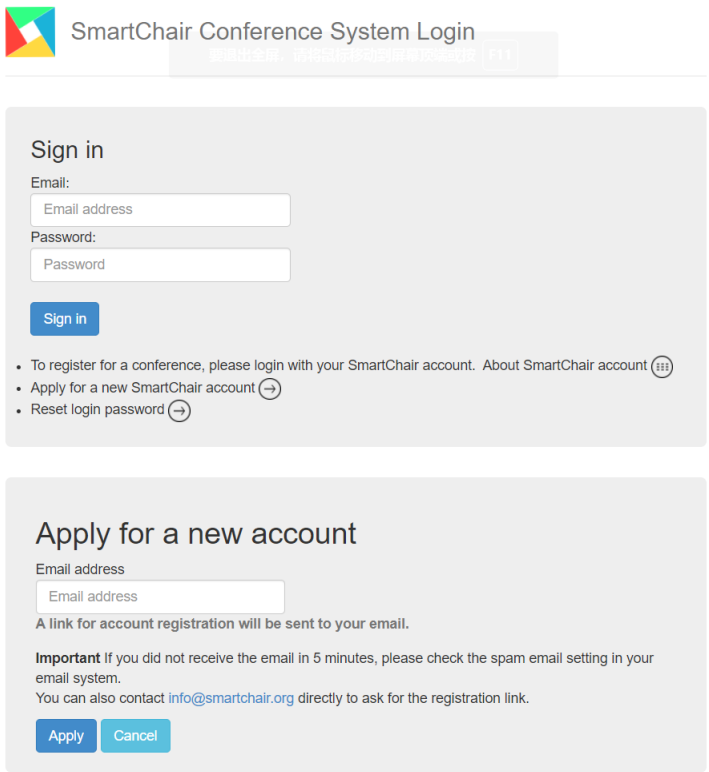
Register your account at *SmartChair*

1. Goto website: http://www.smartchair.org/session/login/
2. Click on the '→' after '`Apply for a new SmartChair account.`'
3. Use your SEU Email for registration
   e.g. 213190186@seu.edu.cn
4. Homepage for our course: http://www.smartchair.org/hp/Wjx-AP2021



Seminar

Zherui Yang

October 29, 2021

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1. Registration of our new system for hw submission
2. A demo for homework submission
3. About Programming
4. Visual Studio 2019 & 2010
5. Summary

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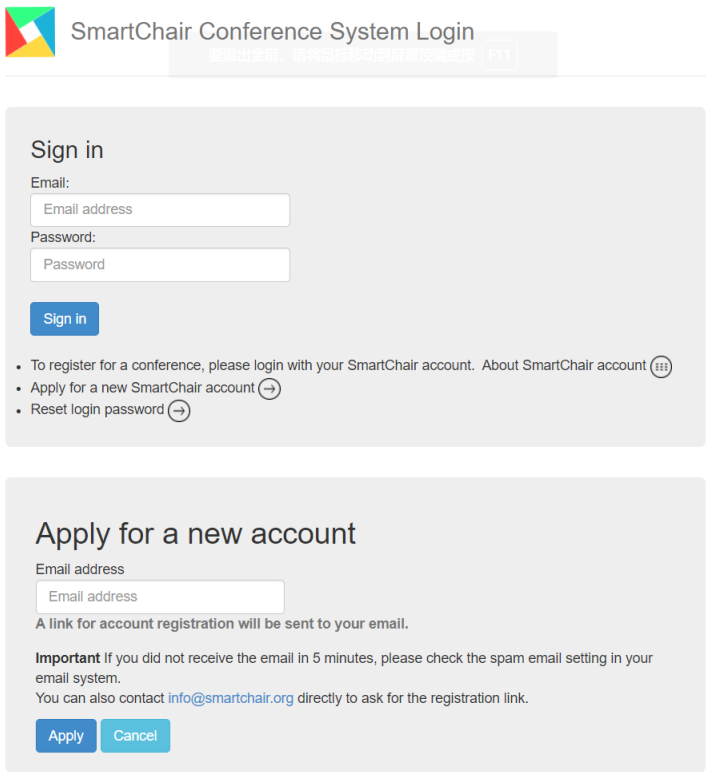

Wait for your confirmation email! (mostly in 5 minutes)

Before you got the email...

About me

Study:

1. GPA – $4.099/4.8$ – $3.88/4.0$;
2. Rank – $15/160$;
3. 10+ in-course award. (of almost all the basic courses you('ll) take)
4. Major target — Applied Mathematics.

Career:

1. (21-) 书院
2. (21-) 至善宣讲团秘书处
3. (21-) Robocup 校队队员
4. (19-20) 团委宣传部

— And we met before.

University life from my view...

A rat race and a white war which is full of stress and infighting.

Opportunities always for those who are prepared.

Figure: 'Awesome'

After you got the confirm email

Attention

1. use real full name to register.
2. Department – seu.

The homepage for your hw submission from now on

Figure: Click on **GO**.

The last step

Figure: Student not General.

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A demo for homework submission

课程信息

- 2021年 9月6日 ~ 2022年 2月10日 @ Nanjing　　HP: http://www.smartchair.org/hp/Wjx-AP2021

选择

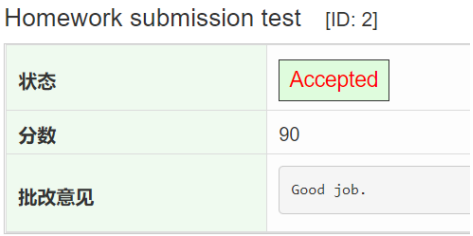
课程注册:	截止日期: 31 October, 2021	状态: [Registered] GO
Homework submission test:	截止日期: 2021-10-31 23:59:59	状态: [未提交] GO

文件下载

- 无文件下载

A demo for homework submission

- You can modify your homework anytime before deadline (even you clicked the submit botton)
- You can get the grade on this page after evaluation on the same page.



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What do you think of Programming / Program?

- State — S
- Input/Output — I, O
- Your program on computer — $F : S \times I \to S' \times O$

A program is a function.

Think about Function

What do you think of **Functions**?

Generally, in three aspects:

1. Map — just as it is in math.
   e.g. `sqrt(2)`
2. Procedure — change the state;
   e.g. `printf("hello world")`
3. Recursion — Divide and Conquer
   e.g. `factorial(3)`, `matmul(A, B)`

Programming is about thinking rather than typing.

OOP, POP, FP, ...

SICP — Structure and Interpretation of Computer Programs [1]

Functional — Racket[2], Lisp, Scheme...

Programming today is more like science. You grab this piece of library and you poke at it. You write programs that poke it and see what it does. And you say, 'Can I tweak it to do the thing I want? ... Nowadays, we do programming by typing.Why MIT stopped teaching SICP

Programming Is Not About Typing, It's About Thinking.

— Rich Hickey

[1] https://mitpress.mit.edu/sites/default/files/sicp/index.html
[2] https://racket-lang.org/

Maybe a better way for C++

It's possible for a skilled programer to learn 50% of any programming language in 30 mins.

Beginner — foreign to grammar, and especially, algorithm.

Learn, exercise, and then summary

How to think about the function/program: what is the

- Input I – parameters – e.g. `scanf`
- Output O – return value – e.g. `printf`
- State S – pass by reference, global/static variables, API of OS
- Map M – body – the logic of your code

of each functions in your program.

Totally different from Analysis and Algebra!

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Best practice to finish your homework and test

do_homework

```
while (not finished)
{
    Project proj = create_project();
    debug_and_test(proj);
    finished = fetch_question();
}
```

Best practice to finish your homework and test

Arrange your submission file.

Suppose there are 3 questions this week, namely ’1’, ’3’, ’4.1’.

```
61519322.zip
|- 61519322
   |- Q1
      |- Q1.cpp
   |- Q3
      |- Q3.cpp
      |- person.cpp
      |- person.h
   |- Q4_1
      |- Q4_1.cpp
```

Create a project for your homework

A good name is a legal *identifier* in C++, or a natual number at least e.g.

1. 'rct'
2. '1', 'proj1', 'exam1'
3. 'week6_q1'
4. ...

How to Debug?

There are two main methods

1. print values to screen
2. breakpoint + watch

Example

Fill the blocks with 1. (just as the paint bucket)

Debug using breakpoint and watch

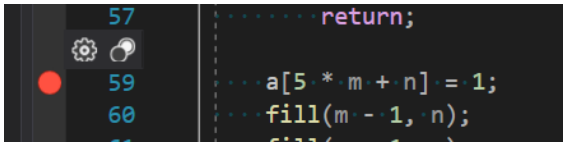

Figure: Breakpoint

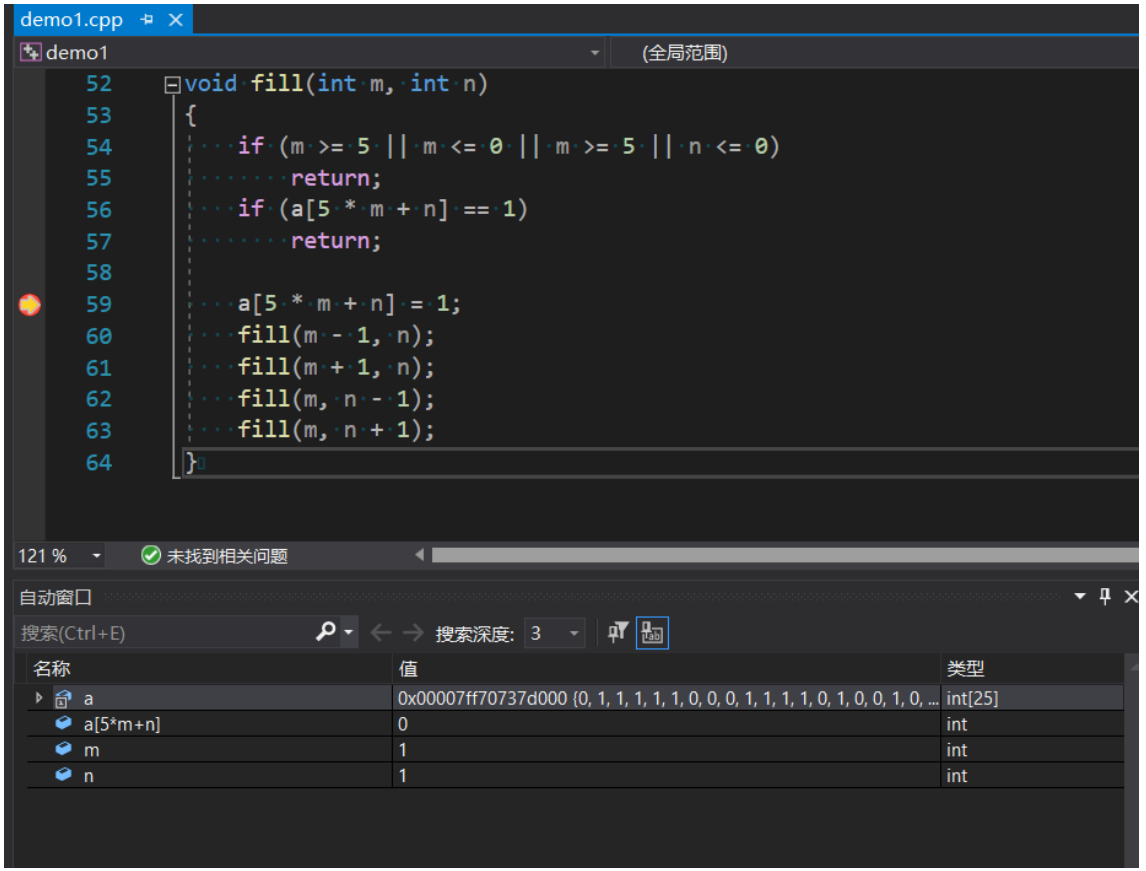

Figure: When line with breakpoint is going to be executed, the program will be paused, and the variables will be shown below.

Debug using breakpoint and watch

Figure: Buttons to control the execution your program

```
    a[5 * m + n] = 1;
    fill(m - 1, n);
    fill(m + 1, n);
    fill(m, n - 1);
    fill(m, n + 1);
}
```

133 %

自动窗口

名称	值	类型
a	0x00159000 int * a	int [25]
a[5*m+n]	0	int
m	1	int
n	1	int

Figure: Debug under VS2010

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Recent Questions

1. Expression Evaluation? $\rightarrow$ Compiler Principle.
2. Infinite Recursion / Loop $\rightarrow$ breakpoint+watch
3. Type casting and redefinition.
4. Where we should (not) use global variables?
5. Generalization —
6. How can i implement xxx? — think about functions
7. What is memory/cpu/... ?
8. How to ask good questions. – what is the bug, how to reproduce the bug.
9. Any other questions?

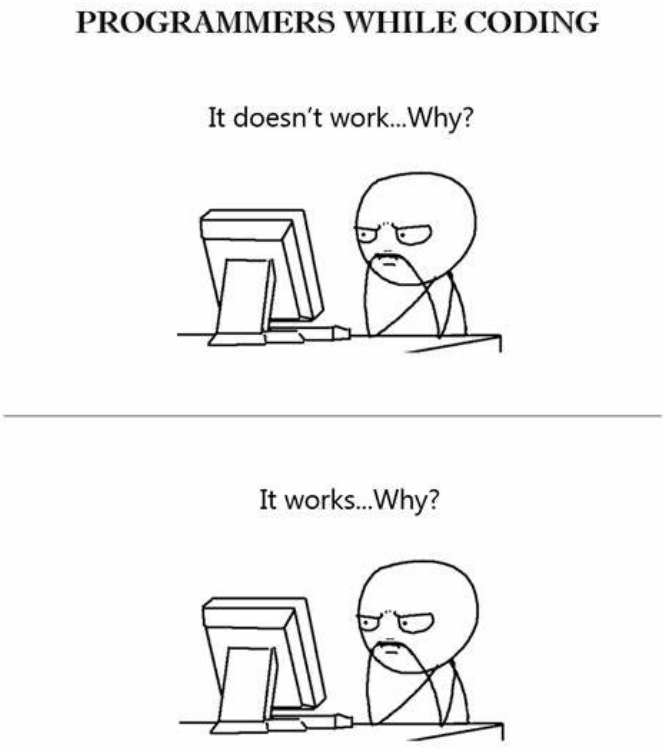

Figure: My coding life.