

# Competitive Coding

cs4fun, Paul Cao

# Welcome

- Goal: prepare our talents to be ready for competitive coding.
- Approach: solid foundation, fun experience, rigorous curriculum
- Expectation: participate during class, complete homework assignments each week
- Questions?

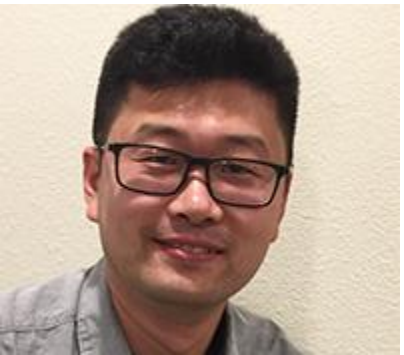
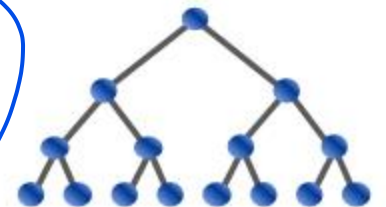
good codes  
correct first

17

Young students

1 < 1/2

**USA Computing Olympiad**



# Introduction

- **Information**

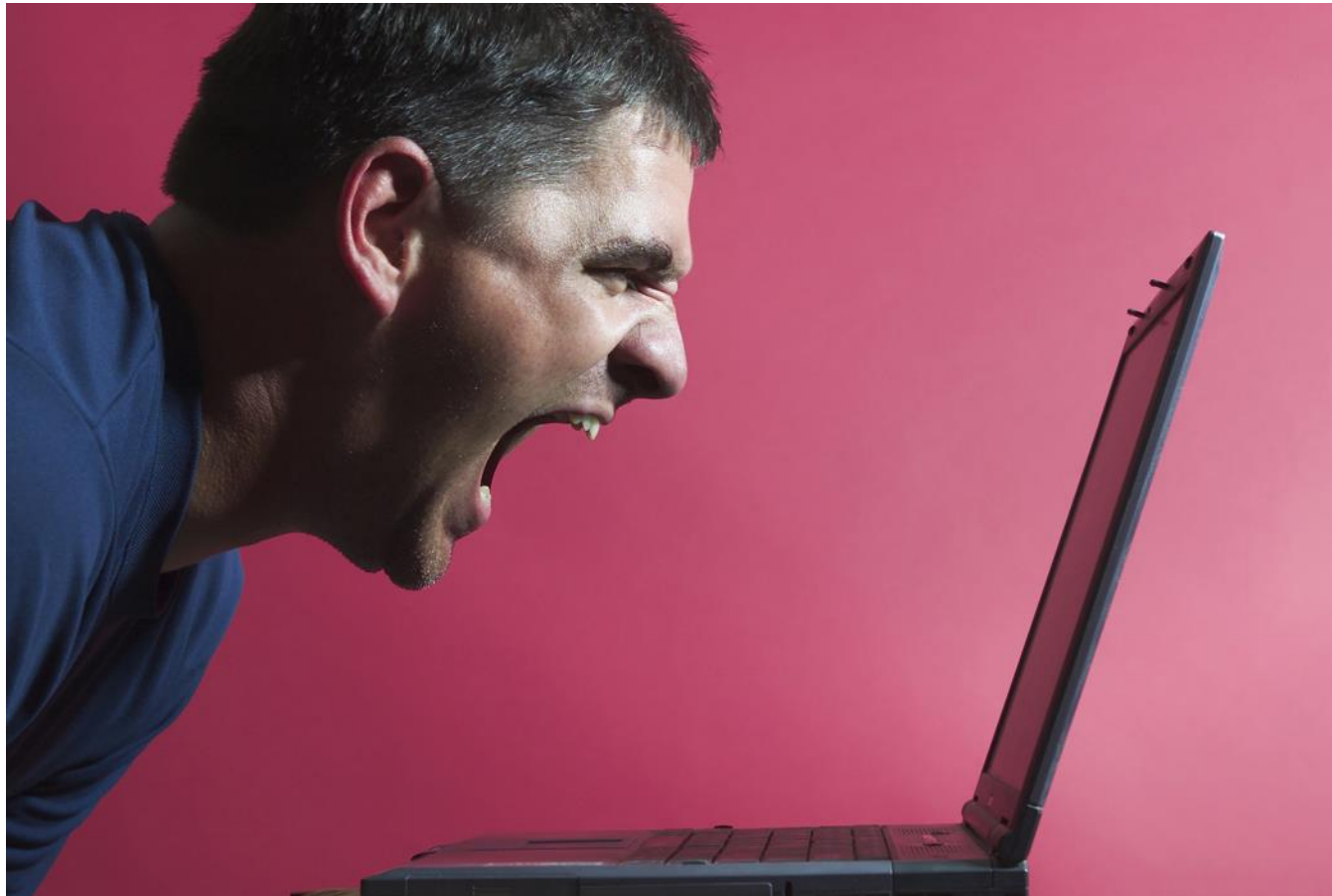
- Our email group: (I will add everyone's email to this group later)
- Google classroom: Please put in the email that parents check the most often and use class codes to enroll in our google classroom (**classroom.google.com**)

- **Setup:**

- Join repl team

# Why should we study computer science?

*design*



A. Because computers are smart

B. Because humans are smart

C. Because computers are fast

D. Because humans are fast

E. Some combinations of the above

How to calculate  $1 + 2 + 3 + 4 + \dots + 100$ ?

• Human  $100 / 1 + 99 / 2 + 98 / \dots 49 + 51 /$

---

5000

• Computer

1 billion / s

1 min

10 s

50

1 / million

10 million

# Computer Classification



personal computer  
2 billion op/second



server  
about 10x faster than a normal PC



super computer  
about 146Mx faster than a normal PC

# Computer hardware

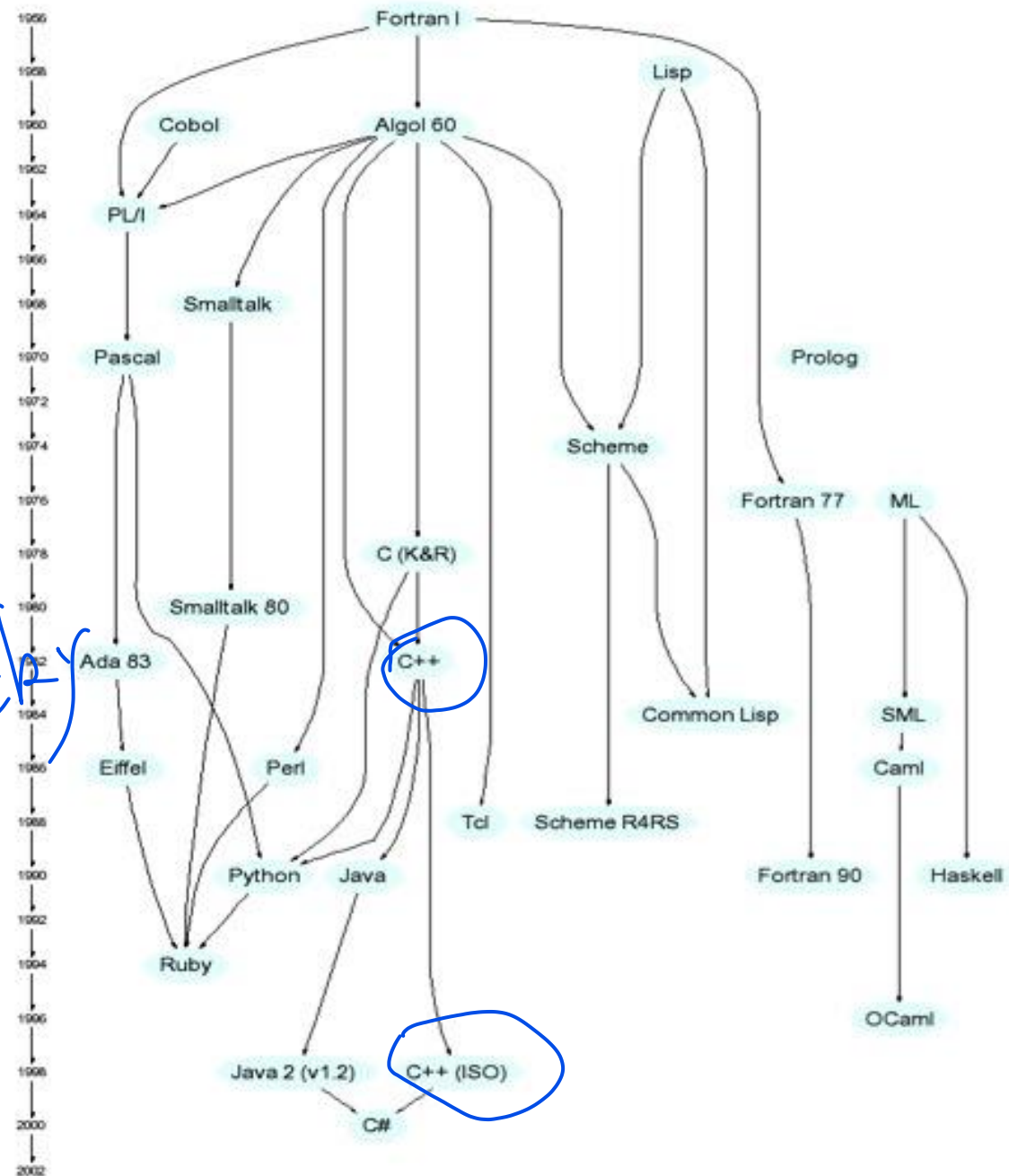
What are the major components of a computer?

- A. CPU
- B. Memory
- C. Disc
- D. Keyboard/monitor
- E. All of the above

# Programming Languages

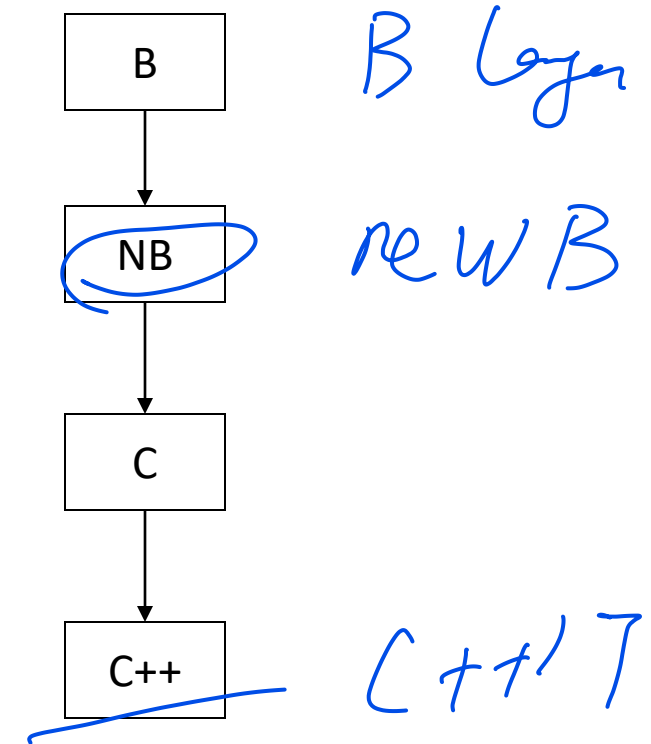
Python/Java  
4s  
C++ (2 seconds)  
fast

tricky





# Bjarne Stroustrup

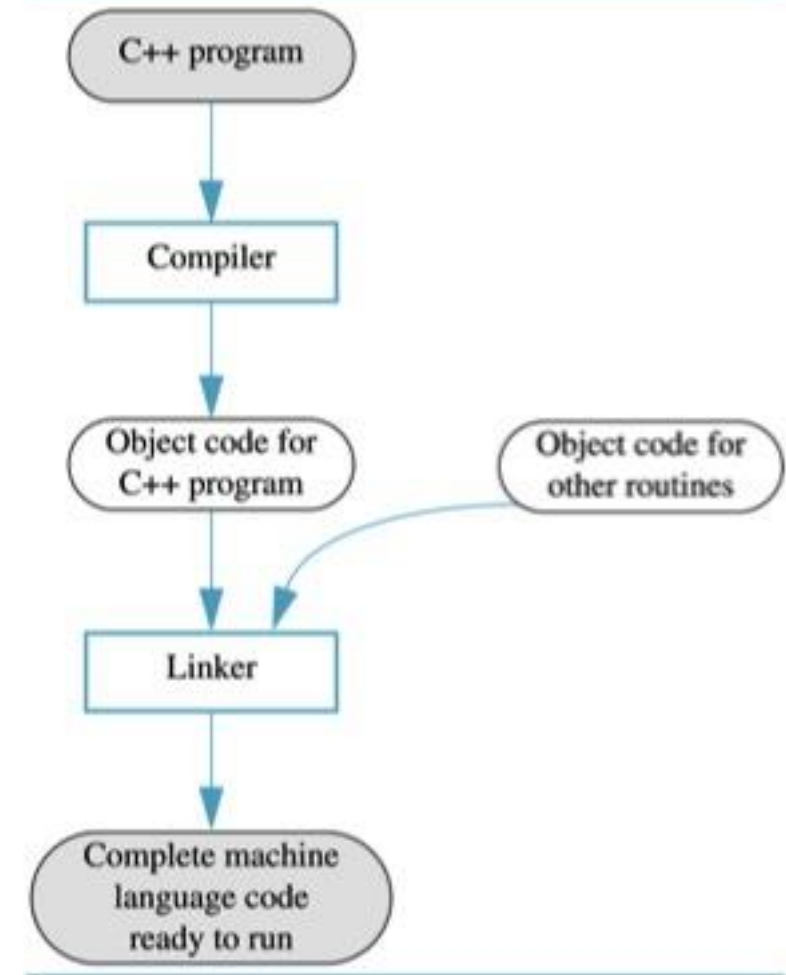


# C++

borrow all books

```
#include <bits/stdc++.h>
using namespace std;
int main(){
    cout<<"hello world" <<endl;
}
```

## Preparing a C++ Program for Running

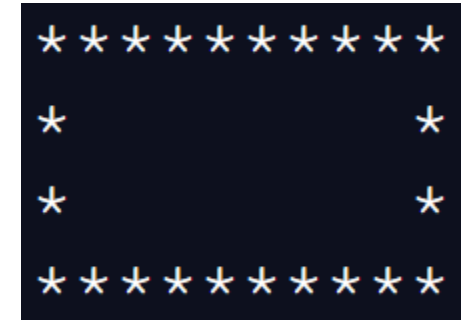


# What is wrong with the following code

I want to print out hello once

```
#include <bits/stdc++.h>  
using namespace std ;  
  
int main ()  
    cout<<"hello"<<endl ;  
}
```

# Which code will print the rectangle to the right?



A

```
#include <iostream>
using namespace std;
int main() {
    cout << "*****";
    cout << " *      *";
    cout << " *      *";
    cout << "*****";
}
```

B

```
#include <iostream>

int main() {
    cout << "*****"<<endl;
    cout << " *      *"<<endl;
    cout << " *      *"<<endl;
    cout << " *      *"<<endl;
    cout << "*****"<<endl;
}
```

C

```
#include <iostream>
using namespace std;
int main() {
    cout << "*****"<<endl;
    cout << " *      *"<<endl;
    cout << " *      *"<<endl;
    cout << " *      *"<<endl;
    cout << "*****"<<endl;
}
```

D

```
using namespace std;
int main() {
    cout << "*****"<<endl;
    cout << " *      *"<<endl;
    cout << " *      *"<<endl;
    cout << " *      *"<<endl;
    cout << "*****"<<endl;
}
```

E. More than one of them will work

# What will the following code print out?

```
#include <iostream>
using namespace std;
int main() {
    cout<<"hell";
    cout<<"o"<<endl;
    cout<<"worl"<<endl;
    cout<<"d";
}
```

- A. hello world
- B. hello  
world
- C. hello  
worl  
d
- D. none of the above

# Exercise/Homework

- See the separate pdf file