CS 214: System Programming

(Sec 02 10:35 AM - 11:30 AM ARC-105)

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What will we do in this recitation?

- Warm up

- Review class materials

- Case study

- Practicing

- Reference

Warm up - think a little more

System?

Linux Windows OS X
Android …
(the place that story start)

Programming?

C/C++,C#,Java,Python…
(foundation)

abilities(how to learn & how to ask)
thinking mode

What's really matter?

Knowledge?

It's important but not the key point
You will forget all of them after exam

Wisdom & Experience

Warm up - think a little more

here → there

How ?

for interests?
pass the final test, get an A?
be expert in c/c++?
linux system knowledge?

…

Review class materials by case

Checklist:
Basic C syntax
Gcc compilation
Basic typing
Systems overview
JVM vs compiled code
Loops/conditionals
Header files

Preparation may quicken the process

How to make two programmers fight ?

Which is the best programming language in the world?

Which is the best IDE ? vim or emacs?

Choose your favourite one:
vim emacs sublime Atom vc vscode …

TIPS: Start from the simplest one like vscode or sublime
or just trying to google c online compiler

question-toy problem

Write a program to print this triangle:

```
*

**

***

****

*****

******

*******
```

Basic C syntax (the principle of 20% vs 80%)
☆ How and where
to find the knowledge unfamiliar for you?

Demo

Think more about the demo

```
#include "stdio.h"

#define MAXROW 10

void main(){

    int i,j;
    for (i=0;i<MAXROW;i++){
        for(j=0;j<i+1;j++){
            printf("*");
        }
        printf("\n");
    }

}

$ gcc -o star starprint.c
```

what's this ? #include

what's that ? #define

where does this come from?

what's the meaning of \n here?
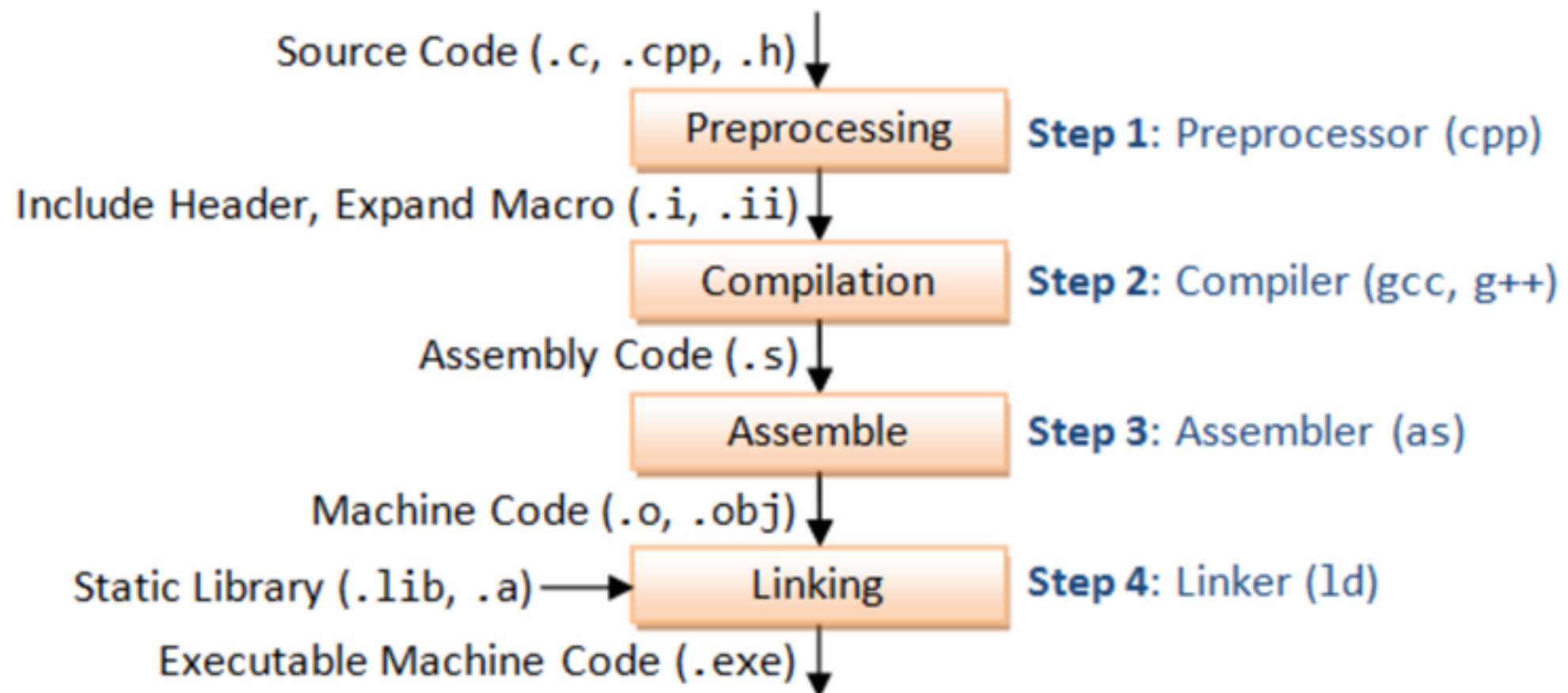
could I upgrade it a little bit more
to specify the line of graph by parameters?

process of compiling

1 whole process of compiling.
2 difference between the files with the different suffix?
3 common gcc parameters?
4 gcc vs jvm ?
5 search the unknown gcc parameters by your self

…

Source Code (.c, .cpp, .h)
Preprocessing — **Step 1**: Preprocessor (cpp)
Include Header, Expand Macro (.i, .ii)
Compilation — **Step 2**: Compiler (gcc, g++)
Assembly Code (.s)
Assemble — **Step 3**: Assembler (as)
Machine Code (.o, .obj)
Static Library (.lib, .a) → Linking — **Step 4**: Linker (ld)
Executable Machine Code (.exe)

refer to:http://www3.ntu.edu.sg/home/ehchua/programming/cpp/gcc_make.html

try to explore more by using $man operation

Homework1 - question1

Write a program to print this triangle:

```
*

**

***

****

*****

******

*******
```

Don't use ten printf statements;
use two nested loops instead.
You'll have to use braces around the body of the outer loop
if it contains multiple statements:

```
for(i = 1; i <= 10; i = i + 1)
{
        /* multiple statements */
        /* can go in here */
}
```

Change your loops to be while loops

Homework1 - question2

What do these loops print?
Determine what they print first, then run them

```
for(i = 0; i < 10; i = i + 2)
{
          printf("%d\n", i);
}


for(i = 100; i >= 0; i = i - 7)
{
          printf("%d\n", i);
}


for(i = 1; i <= 10; i = i + 1)
{
          printf("%d\n", i);
}


for(i = 2; i < 100; i = i * 2)
{
          printf("%d\n", i);
}
```

make a rapid progress

Algorithm:
do more exercises
leetcode, ACM competition…

System:
do more reading
The Linux Programming interface, Linux source code…

Accumulating:
why not start your own technical blog and record your idea
github.io, hexo, JekyII, Octopress…