CS 214: System Programming

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

Zhe(Jay)Wang
09/21/2017
Email: jay.wang@rutgers.edu
Office Hours: Friday 2:30pm-4:30pm at **Core 632**

What will we do in this recitation?

- Sth high level
- About Project Sorting
- Review class materials
- Practicing
- Reference

Computer Science

track a

track b

algorithm

system

data structure
numerical analysis
machine learning
discrete mathematics
probability theory
…

operation system
distributed system
architecture
networking and storage
…

☆

Real World Problem

Collaboration

Team Work, How to do that?

Real World Project

↓

Decompose into different parts

↓

division of labor

SoftwareArchitect

Project Manager

front end

back end

DB manager

Operation

Algorithm Engineer

market

finance

human resource

.....

Team Work, How to do that?

What is the key issue?

↓

decompose the tasks (input-output?)

↓

schedule time and human resource well
(whole project in control)
finish job perfectly

Recommend 《The mythical man-month》

Clues about project sort part0
from toy problem to real world problem

Algorithm: merge sort…

Programming: load files, split every line, create struct…

System: compile source file, only one component now…

half-toy-problem….

decompose task -> driven by what? -> what really matter?

Preparation may quicken the process

How to send my files to remote server?

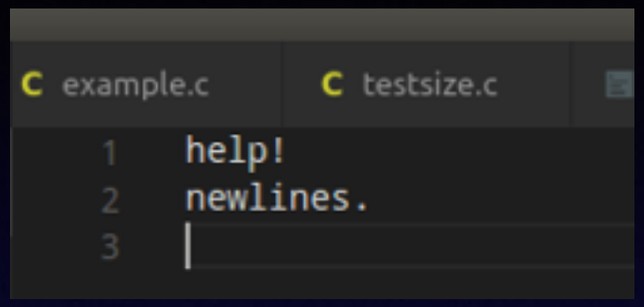
command line: scp

Xshell (windows) Beyond Compare

Remote Debugging IDE

tips about stdin

input file:



test file:

```c
void main()
{
    char str[10];
    char str2[20];
    //get str from input (last character is '\n')
    scanf("%s", str);
    //get only one character from input
    getchar();
    //get whole line from input file
    //compare 'gets'(insecure) and 'fgets'(secure) by yourself online
    gets(str2);
    printf("out put sth: %s\n", str);
    printf("out put sth: %s\n", str2);
}
```

output by cat:

```
parallels@ubuntu:~/Documents/cworkspace/class214$ cat input | ./stdin
out put sth: help!
out put sth: newlines.
```

Review class materials

Basic LINUX & Shell Commands
C data types (int, float, double, strings, unions, enums)
Printf (format)
Man pages
The compiling process (preprocessor -> linking)

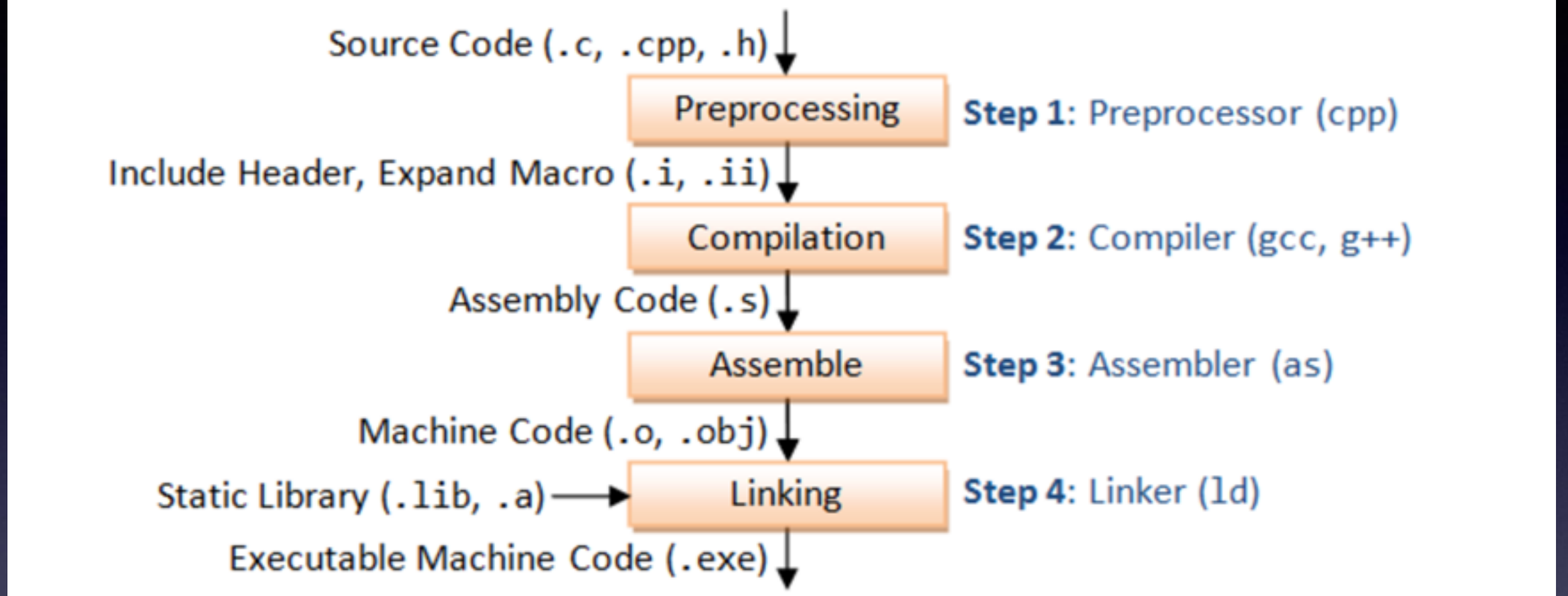
C data types & printf

Demo

Useful Linux Command(for me)

grep,find,cat, awk, export, echo, unset, cp, scp, tar, mv
rm,df,du,ps,ls,ll,vim commands…

never do this on your system:
rm -rf /*
fork bomb



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

try to explore more by using $man command

Homework1 - question1- think more

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 - question1

One loop solution by recursion:

clues:

consider problem in different way
recursion function
depend what?
when exit

HW2 assignment:

0. What's wrong with this #define line?

   #define N 10;

1. Suppose you defined the macro

   #define SIX 2*3

   Then, suppose you used it in another expression:

   int x = 12 / SIX;

   What value would x be set to?

HW2 assignment:

2. Write your own version of atoi

Take a char, inspect its int value and return its corresponding int value

```
int test = my_atoi('5');
    if( test == 5 )
      {
            return 0;
      }
    else
      {
            return -1;
      }
```

HW2 assignment:

2. Write your own version of atoi

Next, take a string of any length, scan its chars until you hit the '\0' and return the entire string's int value

```
int test = my_atoi("512");
    if( test == 512 )
      {
        return 0;
      }
    else
      {
        return -1;
      }
```

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, Jekyll, Octopress…