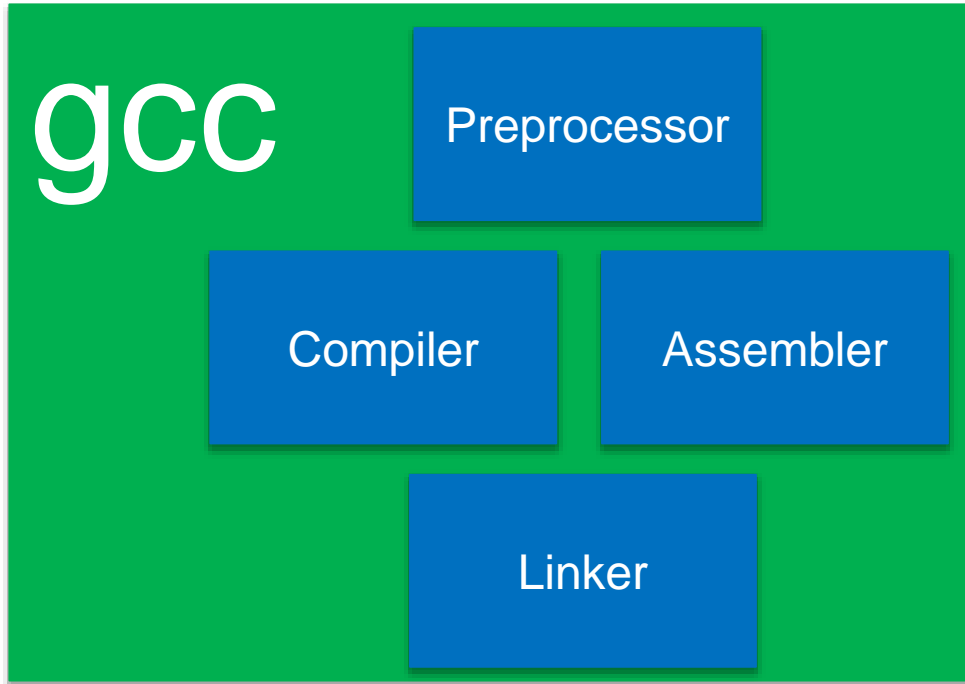


A photograph of a campus scene. In the foreground, there are several tulips in shades of red and yellow. Behind them is a paved area, possibly a walkway or road. In the background, there are several trees, some with green leaves and some with bare branches. A white fence or wall is visible in the distance. The overall scene is bright and sunny.

CS197C

Intro to C

Nicolas Scarri - *September 21, 2016*

gcc

The Whole Shebang

elinux.cs.umass.edu - PuTTY

```
#include "print.h"
int main(int argc, char * argv[]) {
    print("Test");
    return 0;
}
~
"main.c" 5L, 82C
```

elinux.cs.umass.edu - PuTTY

```
elinux2 experimental) > gcc main.c print.c
elinux2 experimental) > ls
a.out main.c print.c print.h
elinux2 experimental) > ./a.out
Test
elinux2 experimental) > █
```

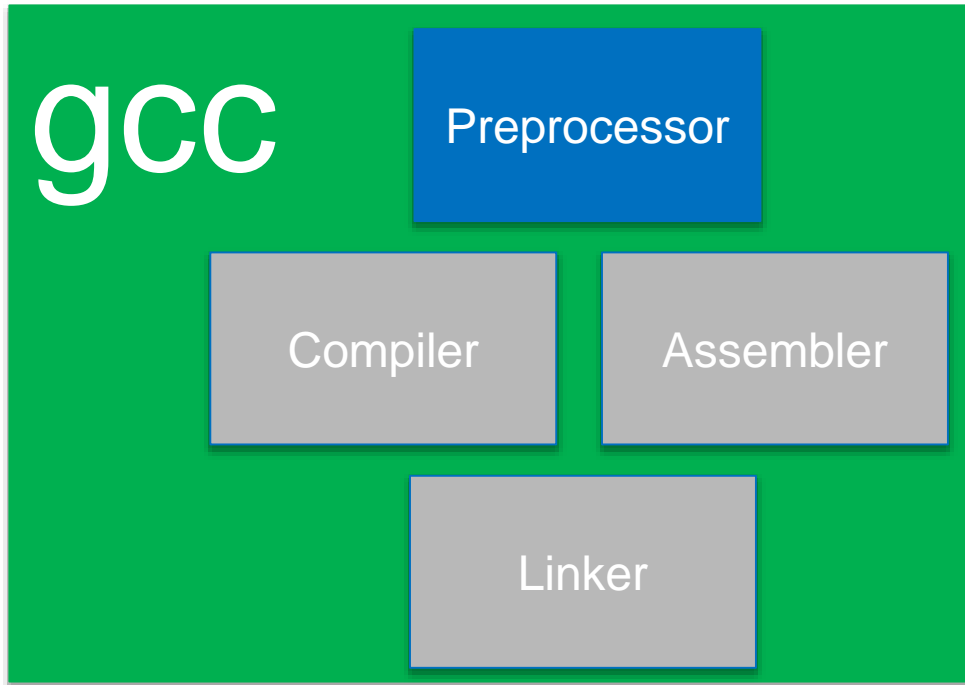
elinux.cs.umass.edu - PuTTY

```
int print(char *);
~
"print.h" 1L, 19C
```


elinux.cs.umass.edu - PuTTY

```
#include <stdio.h>
int print(char * text) {
    printf("%s\n", text);
    return 0;
}
~
"print.c" 5L, 77C
```

gcc -E

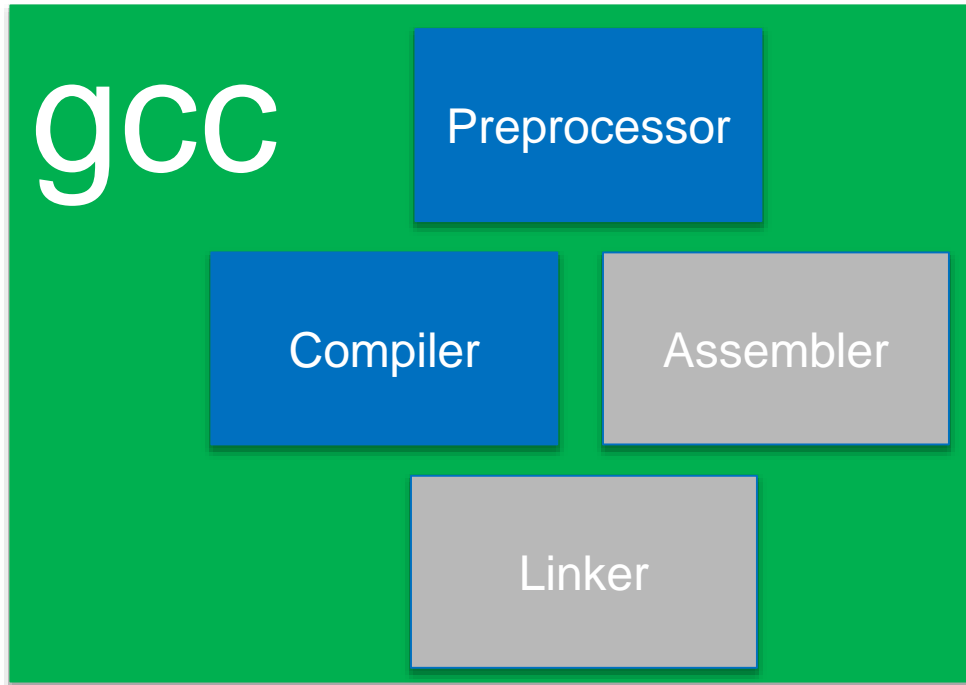


Preprocessing


 elnux.cs.umass.edu - PuTTY

```
elnux2 experimental) > gcc -E main.c
# 1 "main.c"
# 1 "<built-in>"
# 1 "<command-line>"
# 1 "/usr/include/stdc-predef.h" 1 3 4
# 1 "<command-line>" 2
# 1 "main.c"
# 1 "print.h" 1
int print(char *);
# 2 "main.c" 2
int main(int argc, char * argv[]){
    print("Test");
    return 0;
}
elnux2 experimental) > █
```

gcc -S



Compiling

 elnux.cs.umass.edu - PuTTY

```
elnux2 experimental) > ls
a.out main.c print.c print.h
elnux2 experimental) > rm a.out
elnux2 experimental) > ls
main.c print.c print.h
elnux2 experimental) > gcc -S main.c print.c
elnux2 experimental) > ls
main.c main.s print.c print.h print.s
elnux2 experimental) > █
```

Assembler Source

elinux.cs.umass.edu - PuTTY

```

.file    "main.c"
.section .rodata

.LC0:
.string "Test"
.text
.globl  main
.type   main, @function

main:
.LFB0:

.cfi_startproc
pushq  %rbp
.cfi_def_cfa_offset 16
.cfi_offset 6, -16
movq   %rsp, %rbp
.cfi_def_cfa_register 6

```

elinux.cs.umass.edu - PuTTY

```

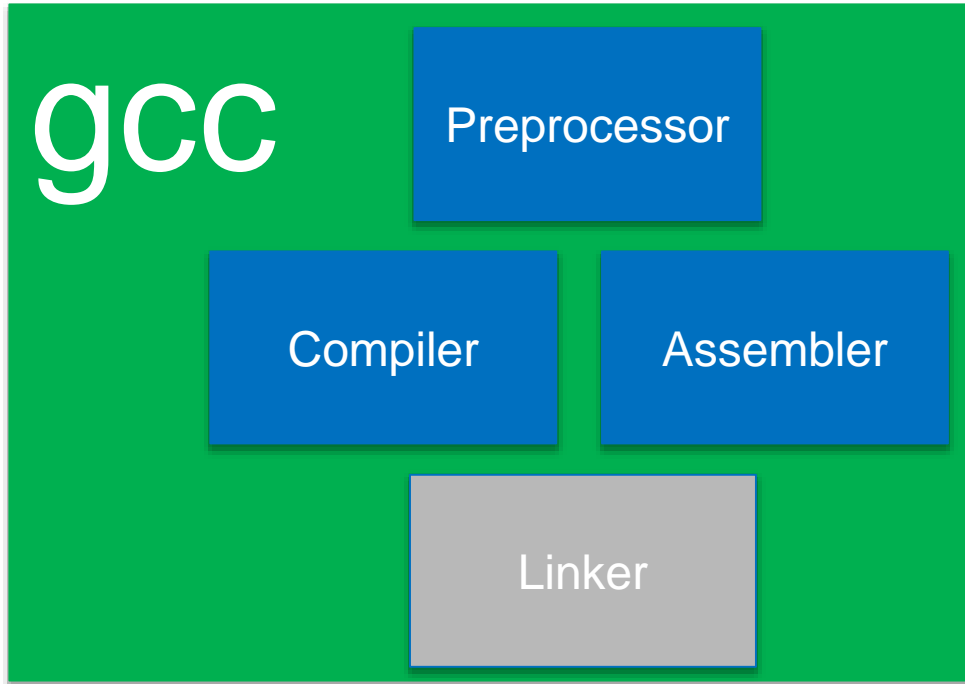
.file    "print.c"
.text
.globl  print
.type   print, @function

print:
.LFB0:

.cfi_startproc
pushq  %rbp
.cfi_def_cfa_offset 16
.cfi_offset 6, -16
movq   %rsp, %rbp
.cfi_def_cfa_register 6
subq   $16, %rsp
movq   %rdi, -8(%rbp)
movq   -8(%rbp), %rax

```

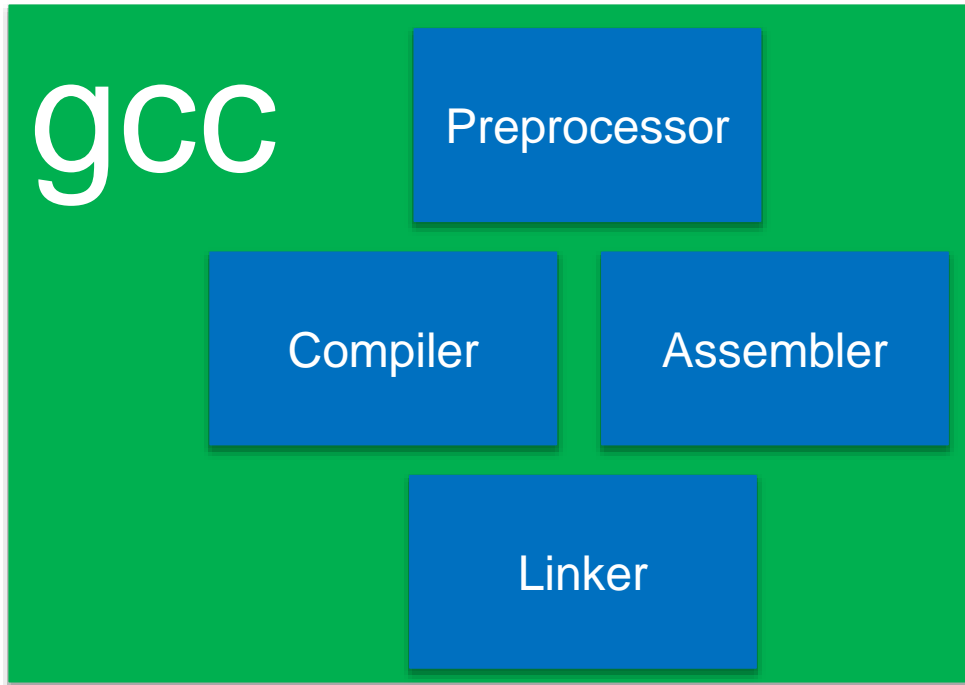

gcc -c




gcc -c

```
elinux2 experimental) > gcc -c main.c print.c
elinux2 experimental) > ls
main.c main.o print.c print.h print.o
elinux2 experimental) > █
```


gcc -o nameofexe




printf

 elnux.cs.umass.edu - PuTTY


```
#include<stdio.h>

int main(int argc, char * argv[]){
    int op1=5;
    int op2=7;
    printf("%i+%i=%i\n", op1, op2, op1+op2);
    return 0;
}
"printf.c" 8L, 130C
```

 elnux.cs.umass.edu - PuTTY


```
elnux2 experimental) > gcc printf.c
elnux2 experimental) > ./a.out
5+7=12
elnux2 experimental) > █
```

scanf


 elnux.cs.umass.edu - PuTTY

```
#include<stdio.h>

int main(int argc, char * argv[]){
    printf("Input an int:");
    int input;
    scanf("%i",&input);
    printf("Input as int:%i\n",input);
    printf("Input as char:%c\n",input);
    return 0;
}
"scanf.c" 10L, 199C
```

 elnux.cs.umass.edu - PuTTY

```
elnux2 experimental) > gcc scanf.c
elnux2 experimental) > ./a.out
Input an int:█
```

 elnux.cs.umass.edu - PuTTY

```
elnux2 experimental) > gcc sc
elnux2 experimental) > ./a.out
Input an int:78
Input as int:78
Input as char:N
elnux2 experimental) > █
```


fopen & fclose

elinux.cs.umass.edu - PuTTY

```
#include<stdio.h>

int main(int argc, char * argv[]){
    FILE * inputFile = fopen("input.txt","r");
    int input;
    fscanf(inputFile, "%i",&input);
    fclose(inputFile);
    FILE * outputFile = fopen("output.txt","w");
    fprintf(outputFile, "%i",input);
    fclose(outputFile);
    return 0;
}
"fileio.c" 13L, 278C
```

elinux.cs.umass.edu edu - PuTTY

56

"input.txt"

```
erimental) > gcc fileio.c
erimental) > ./a.out
```

elinux.cs.umass.edu -

56

"output.txt"

Your Assignment

```
elinux.cs.umass.edu - PuTTY
C G F 0.89402944 I -628131597 C U F 0.8987373 C F C N
F 0.046165943 C K I -898862630 F 0.20252013 I -1074797
352 F 0.11681563 F 0.88717264 F 0.7676326 I -817826750
"input.txt" 1L, 811C 1,1 All

elinux... -628131597 -89886
2630 -1074797352
-817826750 -11737
50419 218306199 1
259648167 -520192
274 -1053386058 -
2127538001 695173
979 1057197328 -1
1,1 All

elinux... G U F N K Q U P K
R R L V C B F P
Z W R
1,1 All

eln... 0.894029 0.89873
7 0.046166 0.202
520 0.116816 0.8
87173 0.767633 0
.772099 0.882681
0.213968 0.9606
49 0.675053 0.85
7173 0.233460 0.
1,1 All
```

Your Assignment

The image shows a PuTTY terminal window titled 'elinux.cs.umass.edu - PuTTY'. The main window displays a file listing with columns of file names, sizes, permissions, and dates. Four specific characters are circled in red: 'C' at the start of the first line, 'C' before 'K' in the second line, 'C' before 'U' in the third line, and 'C' before 'F' in the fourth line. Below the main window are three smaller terminal windows, each showing a zoomed-in view of a specific column from the main window. Red lines connect the circled characters to their respective zoomed-in views. The first zoomed view shows the first column (file names), the second shows the second column (file sizes), and the third shows the third column (permissions).

```
elinux.cs.umass.edu - PuTTY
C G F 0.89402944 I -628131597 C U F 0.8987373 C F C N
F 0.046165943 C K I -898862630 F 0.20252013 I -1074797
352 F 0.11681563 F 0.88717264 F 0.7676326 I -817826750
"input.txt" 1L, 811C 1,1 All

elinux...
-628131597 -89886
2630 -1074797352
-817826750 -11737
50419 218306199 1
259648167 -520192
274 -1053386058 -
2127538001 695173
979 1057197328 -1
1,1 All

elinux...
G U F N K Q U P K
R R L V C B F P
Z W R
1,1 All

eln...
0.894029 0.89873
7 0.046166 0.202
520 0.116816 0.8
87173 0.767633 0
.772099 0.882681
0.213968 0.9606
49 0.675053 0.85
7173 0.233460 0.
1,1 All
```

A photograph of a UMass Amherst campus scene, overlaid with a semi-transparent dark red filter. In the foreground, a row of tulips in shades of pink and yellow is in bloom. Behind them is a paved walkway and a grassy area. In the background, a large, modern building with horizontal bands of dark and light panels is visible, partially obscured by bare trees. The overall mood is serene and academic.

UMassAmherst
The Commonwealth's Flagship Campus