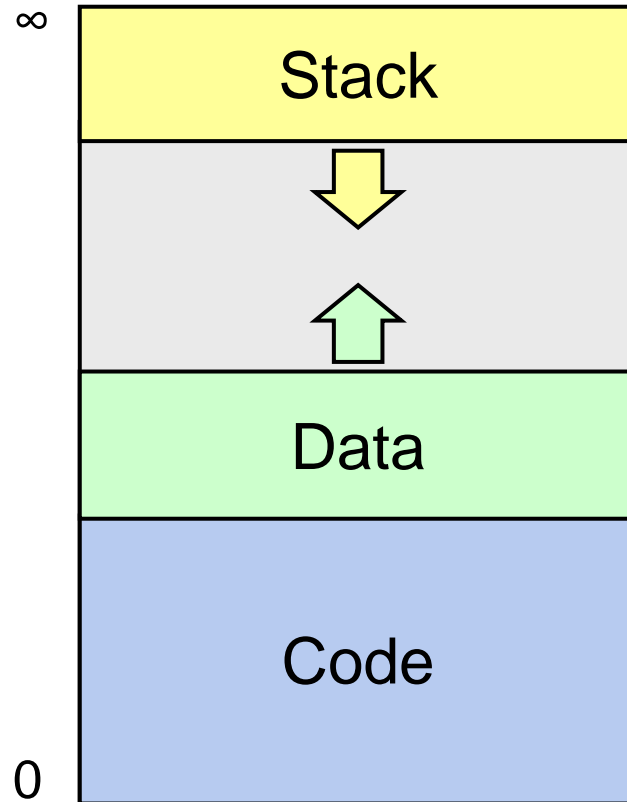
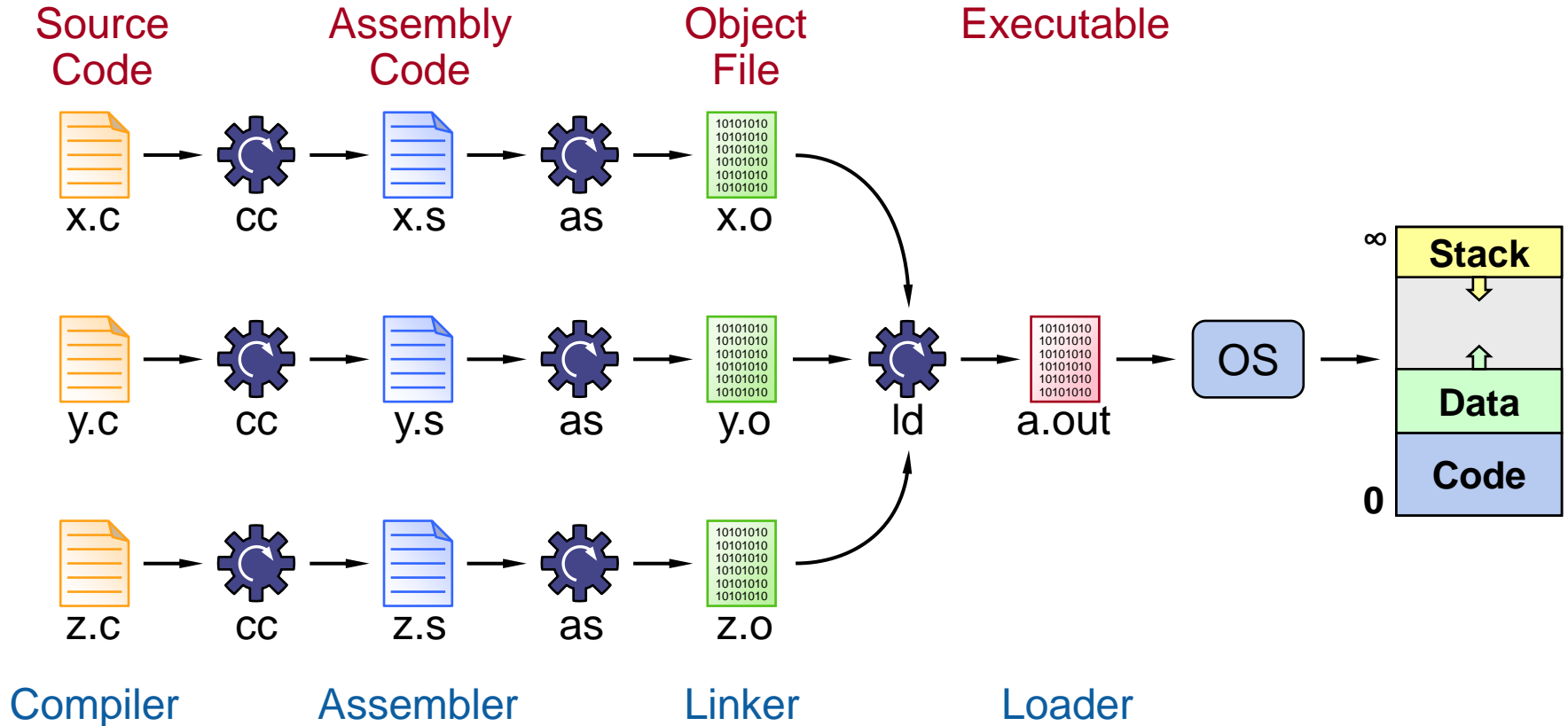


# Memory Layout for Process



# Creating a Process



# A Simple Example

## main.c

```
extern float sin();
extern printf(), scanf();

main() {
    double x, result;
    printf("Type number: ");
    scanf("%f", &x);
    result = sin(x);
    printf("Sine is %f\n",
           result);
}
```

## math.c

```
double sin(double x) {
    ...
}
```

## stdio.c

```
FILE* stdin, stdout;

int printf(const char* format,...) {
    ...
    fputc(c, stdout);
    ...
}

int scanf(const char* format,...) {
    ...
    c = fgetc(stdin);
    ...
}
```


# main.o Object File

## main.c

```
extern float sin();
extern printf(), scanf();

main() {
    double x, result;
    printf("Type number: ");
    scanf("%f", &x);
    result = sin(x);
    printf("Sine is %f\n",
           result);
}
```

*“Store the final location of sin  
at offset 60 in the text section”*



## main.o

0	main:	text section
30	call printf	
52	call scanf	
60	call sin	
86	call printf	
0	_s1: "Type number: "	data section
14	_s2: "%f"	
17	_s3: "Sine is %f\n"	
main	T[0]	symbols
_s1	D[0]	
_s2	D[14]	
_s3	D[17]	
printf	T[30]	relocation
printf	T[86]	
scanf	T[52]	
sin	T[60]	
_s1	T[24]	
_s2	T[54]	
_s3	T[80]	

# stdio.o Object File

## stdio.c

```
FILE* stdin, stdout;

int printf(const char* format,
  ...) {
  ...
  fputc(c, stdout);
  ...
}

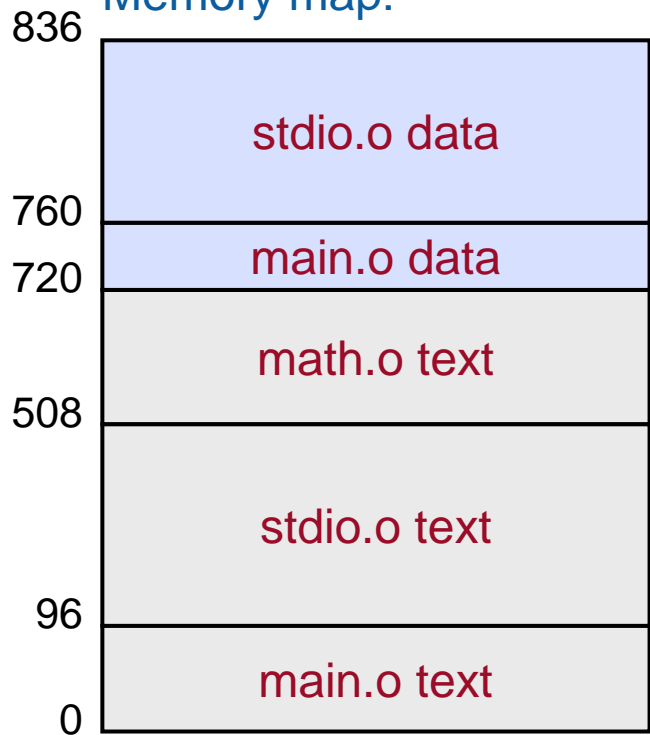
int scanf(const char* format,
  ...) {
  ...
  c = fgetc(stdin);
  ...
}
```

## stdio.o

...		text section
44	printf:	
...		
118	load stdout	
...		
232	scanf:	
...		
306	load stdin	
...		
0	stdin:	data section
8	stdout:	
printf	T[44]	symbols
scanf	T[232]	
stdin	D[0]	
stdout	D[8]	
stdout	T[118]	relocation
fputc	T[122]	
stdin	T[306]	
fgetc	T[310]	

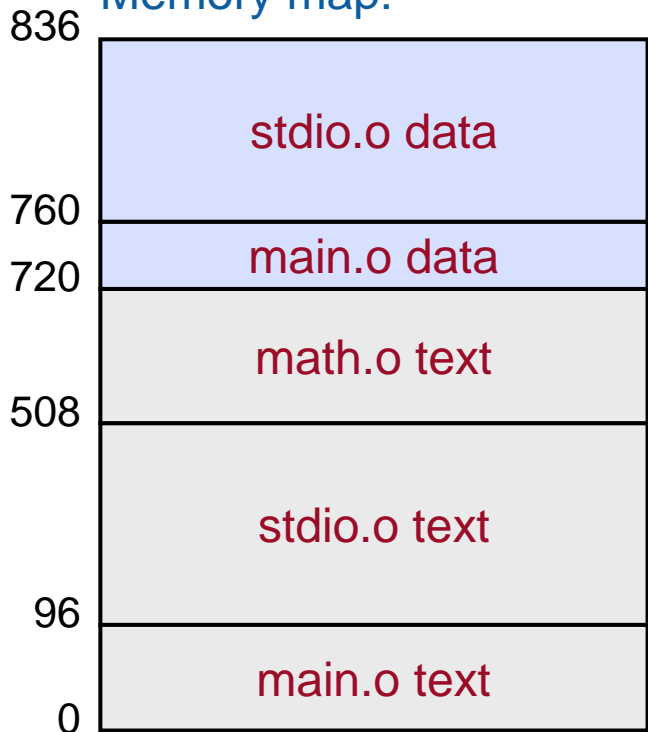
# After Pass 1

Memory map:



# After Pass 2

Memory map:



Symbol table:

Name	File	Sec	Offset	Addr
main	main.o	T	0	0
_s1	main.o	D	0	720
_s2	main.o	D	14	734
_s3	main.o	D	17	737
printf	stdio.o	T	38	134
scanf	stdio.o	T	232	328
stdin	stdio.o	D	0	760
stdout	stdio.o	D	8	768
sin	math.o	T	0	508

# Relocation

