

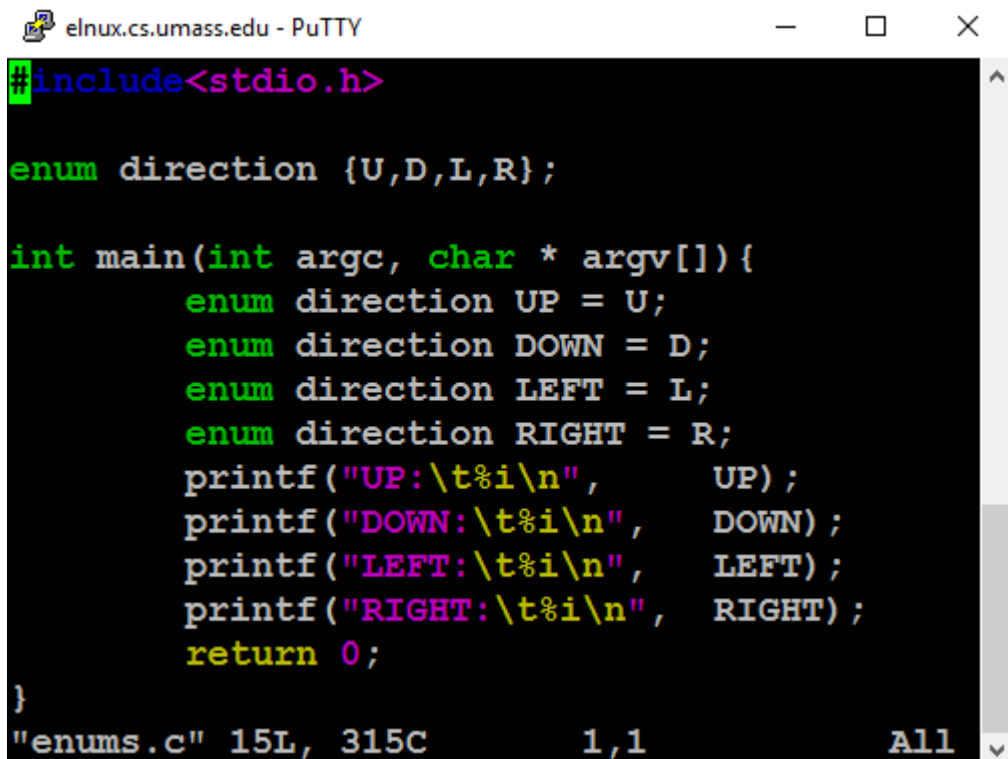


CS197C

Intro to C

Nicolas Scarci - *October 8, 2016*

enums



The image shows a PuTTY terminal window titled "elinux.cs.umass.edu - PuTTY". The terminal displays the following C code:

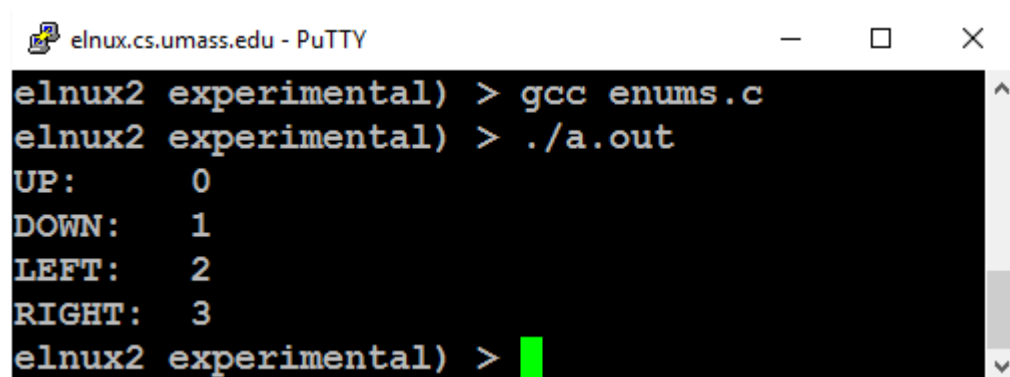
```
#include<stdio.h>

enum direction {U,D,L,R};

int main(int argc, char * argv[]){
    enum direction UP = U;
    enum direction DOWN = D;
    enum direction LEFT = L;
    enum direction RIGHT = R;
    printf("UP:\t%i\n",    UP);
    printf("DOWN:\t%i\n",    DOWN);
    printf("LEFT:\t%i\n",    LEFT);
    printf("RIGHT:\t%i\n",    RIGHT);
    return 0;
}
```

At the bottom of the terminal, the status bar shows: "enums.c" 15L, 315C 1,1 All

enums



```
elinux2 experimental) > gcc enums.c
elinux2 experimental) > ./a.out
UP:      0
DOWN:    1
LEFT:    2
RIGHT:   3
elinux2 experimental) >
```

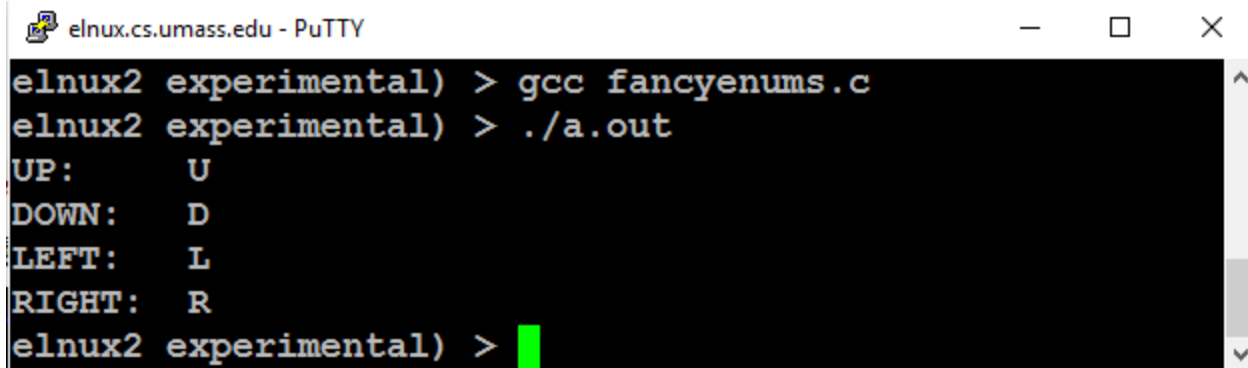
enums

```
elinux.cs.umass.edu - PuTTY
#include<stdio.h>

typedef enum {U='U',D='D',L='L',R='R'} direction;

int main(int argc, char * argv[]){
    direction UP = U;
    direction DOWN = D;
    direction LEFT = L;
    direction RIGHT = R;
    printf("UP:\t%c\n",      UP);
    printf("DOWN:\t%c\n",    DOWN);
    printf("LEFT:\t%c\n",    LEFT);
    printf("RIGHT:\t%c\n",   RIGHT);
    return 0;
}
"fancyenums.c" 15L, 319C      1,1      All 3
```

enums



```
elinux2 experimental) > gcc fancyenums.c
elinux2 experimental) > ./a.out
UP:      U
DOWN:    D
LEFT:    L
RIGHT:   R
elinux2 experimental) >
```

union

```
eLinux.cs.umass.edu - PuTTY  -  □  ×  
#include<stdio.h>  
  
typedef union{  
    int i;  
    float f;  
} number;  
  
int main(int argc, char * argv[]){  
    number num;  
    printf ("%p==%p==%p\n", &num, &num.i, &num.f) ;  
    num.i=5;  
    printf ("%i\t\t%f\n", num.i, num.f) ;  
    num.f=7.5;  
    printf ("%i\t%f\n"    , num.i, num.f) ;  
    return 0;  
}  
"union.c" 16L, 260C 1,1 All
```

union

elinux.cs.umass.edu - PuTTY

```
elinux2 experimental) > gcc union.c
elinux2 experimental) > ./a.out
0x7fff1784b470==0x7fff1784b470==0x7fff1784b470
5          0.000000
1089470464 7.500000
elinux2 experimental) >
```

Your Assignment

```

XXXXXXXXXXXX
XP      *   XX
XmX^XX  XX
X X  :X  XX
X\ XXXX:  XX
XX/     mXMD
XXX^XXX*X
XjX^XX   X
X/           XX
XXXXXXXXXXXX

```

```

XXXXXXXXXXXX
XP      *   XX
XwX^XX  XX
X X  :X  XX
X\ XXXX:  XX
XX/     mXMD
XXX^XXX*X
XjX^XX   X
X/           XX
XXXXXXXXXXXX

```

```

XXXXXXXXXXXX
X      ^   XX
XwX*XX  XX
X X  :X  XX
X\ XXXX. XX
XX\     wXMI
XXX*XXX^X
X X*XX   X
XP           XX
XXXXXXXXXXXX

```


structs

elinux.cs.umass.edu - PuTTY

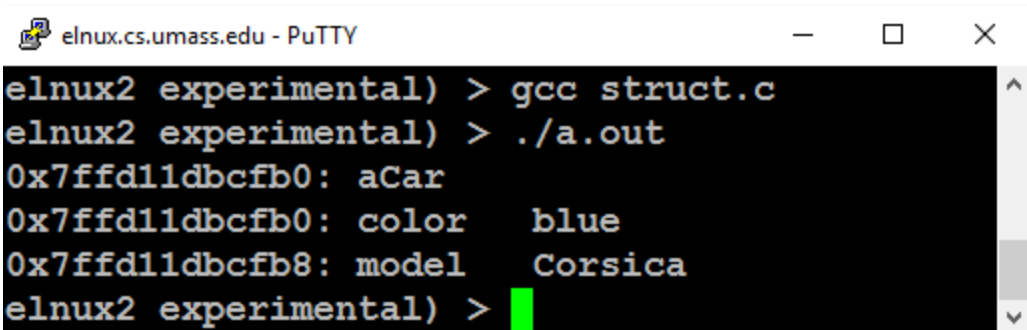
```
#include<stdio.h>

typedef struct{
    char * color;
    char * model;
} car;

int main(int argc, char * argv[]){
    car aCar= {"blue","Corsica"};
    printf("%p:\taCar\t\n",&aCar);
    printf("%p:\tcolor\t%s\n",&aCar.color,aCar.color);
    printf("%p:\tmodel\t%s\n",&aCar.model,aCar.model);
    return 0;
}

"struct.c" 14L, 288C                                1,1                                All
```

structs



```
elinux2 experimental) > gcc struct.c  
elinux2 experimental) > ./a.out  
0x7ffd11dbcfb0: aCar  
0x7ffd11dbcfb0: color    blue  
0x7ffd11dbcfb8: model   Corsica  
elinux2 experimental) >
```

members

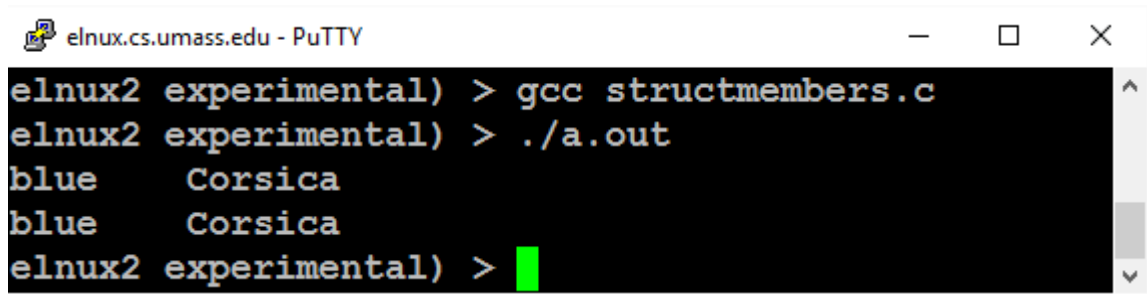
```
elinux.cs.umass.edu - PuTTY
#include<stdio.h>

typedef struct{
    char * color;
    char * model;
} car;

void paintCar(car aCar, char * newColor){
    aCar.color = newColor;
}

int main(int argc, char * argv[]){
    car aCar= {"blue","Corsica"};
    printf("%s\t%s\n",aCar.color,aCar.model);
    paintCar(aCar, "red");
    printf("%s\t%s\n",aCar.color,aCar.model);
    return 0;
}
"structmembers.c" 18L, 331C    1,1    All
```

members



```
elnux.cs.umass.edu - PuTTY
elnux2 experimental) > gcc structmembers.c
elnux2 experimental) > ./a.out
blue   Corsica
blue   Corsica
elnux2 experimental) >
```

members

elinux.cs.umass.edu - PuTTY

```

#include<stdio.h>

typedef struct{
    char * color;
    char * model;
} car;

void paintCar(car aCar, char * newColor){
    aCar.color = newColor;
}

int main(int argc, char * argv[]){
    car aCar= {"blue", "Corsica"};
    printf("%s\t%s\n", aCar.color, aCar.model);
    paintCar(aCar, "red");
    printf("%s\t%s\n", aCar.color, aCar.model);
    return 0;
}

```

"structmembers.c" 18L, 331C 1,1 All

main

argc	1
argv	0xbf825794
aCar.color	0x400664
aCar.model	0x400669

members

elinux.cs.umass.edu - PuTTY

```

#include<stdio.h>

typedef struct{
    char * color;
    char * model;
} car;

void paintCar(car aCar, char * newColor){
    aCar.color = newColor;
}

int main(int argc, char * argv[]){
    car aCar= {"blue", "Corsica"};
    printf("%s\t%s\n", aCar.color, aCar.model);
    paintCar(aCar, "red");
    printf("%s\t%s\n", aCar.color, aCar.model);
    return 0;
}
"structmembers.c" 18L, 331C      1,1      All

```

paintCar

aCar.color	0x400664	
aCar.model	0x400669	
newColor	0x40067c	794
		4
		9

members

elinux.cs.umass.edu - PuTTY

```

#include<stdio.h>

typedef struct{
    char * color;
    char * model;
} car;

void paintCar(car aCar, char * newColor){
    aCar.color = newColor;
}

int main(int argc, char * argv[]){
    car aCar= {"blue", "Corsica"};
    printf("%s\t%s\n", aCar.color, aCar.model);
    paintCar(aCar, "red");
    printf("%s\t%s\n", aCar.color, aCar.model);
    return 0;
}

```

"structmembers.c" 18L, 331C 1,1 All

paintCar

aCar.color	0x40067c	
aCar.model	0x400669	
newColor	0x40067c	794
		4
		9

members

elinux.cs.umass.edu - PuTTY

```

#include<stdio.h>

typedef struct{
    char * color;
    char * model;
} car;

void paintCar(car aCar, char * newColor){
    aCar.color = newColor;
}

int main(int argc, char * argv[]){
    car aCar= {"blue", "Corsica"};
    printf("%s\t%s\n", aCar.color, aCar.model);
    paintCar(aCar, "red");
    printf("%s\t%s\n", aCar.color, aCar.model);
    return 0;
}

```

"structmembers.c" 18L, 331C 1,1 All

main

argc	1
argv	0xbf825794
aCar.color	0x400664
aCar.model	0x400669

indirection

elinux.cs.umass.edu - PuTTY

```

#include<stdio.h>

typedef struct{
    char * color;
    char * model;
} car;

void paintCar(car * carPtr, char * newColor){
    carPtr->color = newColor;
}

int main(int argc, char * argv[]){
    car aCar= {"blue", "Corsica"};
    printf("%s\t%s\n", aCar.color, aCar.model);
    paintCar(&aCar, "red");
    printf("%s\t%s\n", aCar.color, aCar.model);
    return 0;
}

```

"indirection.c" 18L, 339C

main	
argc	1
argv	0xbf825794
0x7ffc8234	aCar
aCar.color	0x400664
aCar.model	0x400669

indirection

elinux.cs.umass.edu - PuTTY

```

#include<stdio.h>

typedef struct{
    char * color;
    char * model;
} car;

void paintCar(car * carPtr, char * newColor){
    carPtr->color = newColor;
}

int main(int argc, char * argv[]){
    car aCar= {"blue","Corsica"};
    printf("%s\t%s\n",aCar.color,aCar.model);
    paintCar(&aCar, "red");
    printf("%s\t%s\n",aCar.color,aCar.model);
    return 0;
}

```

"indirection.c" 18L, 339C

paintCar		
carPtr	0x7ffc8234	
newColor	0x40067c	
		794
		4
aCar.model	0x400669	

All

indirection

elinux.cs.umass.edu - PuTTY

```

#include<stdio.h>

typedef struct{
    char * color;
    char * model;
} car;

void paintCar(car * carPtr, char * newColor){
    carPtr->color = newColor;
}

int main(int argc, char * argv[]){
    car aCar= {"blue","Corsica"};
    printf("%s\t%s\n",aCar.color,aCar.model);
    paintCar(&aCar, "red");
    printf("%s\t%s\n",aCar.color,aCar.model);
    return 0;
}

```

"indirection.c" 18L, 339C

paintCar	
car	
new	
main	
argc	1
argv	0xbf825794
0x7ffc8234	aCar
aCar.color	0x40067c
aCar.model	0x400669

1,1

All

indirection

elinux.cs.umass.edu - PuTTY

```

#include<stdio.h>

typedef struct{
    char * color;
    char * model;
} car;

void paintCar(car * carPtr, char * newColor){
    carPtr->color = newColor;
}

int main(int argc, char * argv[]){
    car aCar= {"blue","Corsica"};
    printf("%s\t%s\n",aCar.color,aCar.model);
    paintCar(&aCar, "red");
    printf("%s\t%s\n",aCar.color,aCar.model);
    return 0;
}

```

"indirection.c" 18L, 339C 1,1 All

paintCar	
carPtr	0x7ffc8234
newColor	0x40067c
	94
	c
aCar.model	0x400669

indirection

elinux.cs.umass.edu - PuTTY

```

#include<stdio.h>

typedef struct{
    char * color;
    char * model;
} car;

void paintCar(car * carPtr, char * newColor){
    carPtr->color = newColor;
}

int main(int argc, char * argv[]){
    car aCar= {"blue", "Corsica"};
    printf("%s\t%s\n", aCar.color, aCar.model);
    paintCar(&aCar, "red");
    printf("%s\t%s\n", aCar.color, aCar.model);
    return 0;
}

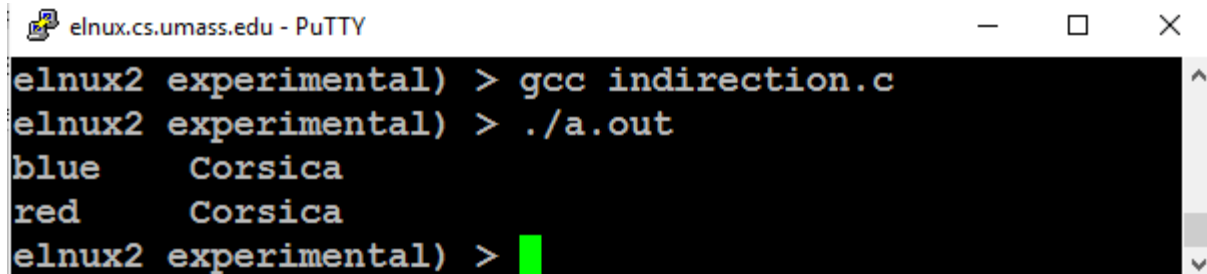
```

"indirection.c" 18L, 339C

main	
argc	1
argv	0xbf825794
aCar	0x7ffc8234
aCar.color	0x40067c
aCar.model	0x400669

All

indirection



```
elinux2 experimental) > gcc indirection.c  
elinux2 experimental) > ./a.out  
blue    Corsica  
red     Corsica  
elinux2 experimental) >
```

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 light and dark panels is visible, partially obscured by bare trees. The overall mood is serene and academic.

UMassAmherst
The Commonwealth's Flagship Campus