

Computer Science 50

Introduction to Computer Science I

Harvard College

Week 5

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“iPhone / iPod touch v1.1.1 jailbreak code posted”



Image from <http://www.engadget.com/2007/10/21/iphone-ipod-touch-v1-1-1-jailbreak-code-posted/>.

Hexadecimal

`0xdeadbeef`

Passing by Value

```
void  
swap(int a, int b)  
{  
    int tmp;  
  
    tmp = a;  
    a = b;  
    b = tmp;  
}
```

see
buggy3.c

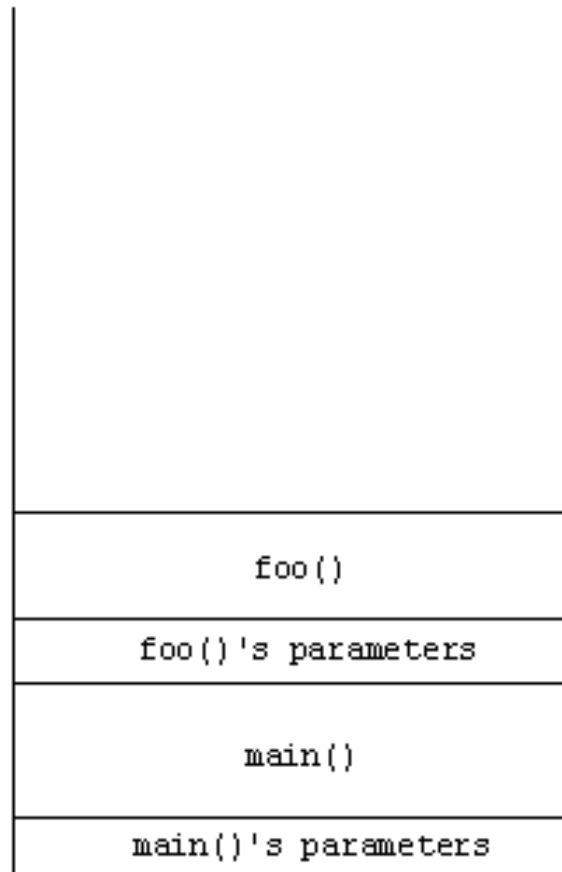
Passing by Reference

```
void  
swap(int *a, int *b)  
{  
    int tmp;  
  
    tmp = *a;  
    *a = *b;  
    *b = tmp;  
}
```

see
swap.c

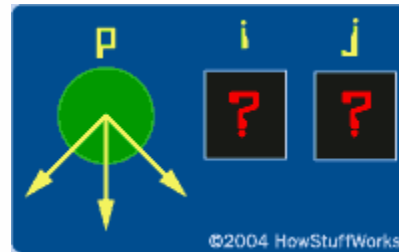
The Stack

Revisited



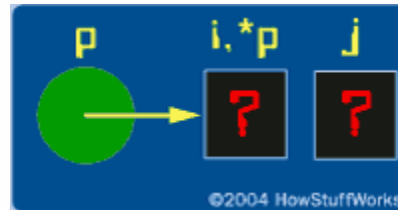
Pointers

```
int i, j;  
int *p;
```



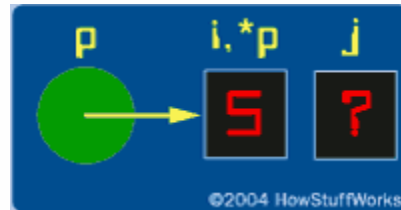
Pointers

```
p = &i;
```



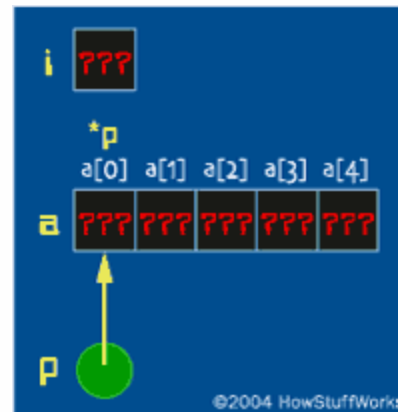
Pointers

```
*p = 5;
```



Arrays as Pointers

```
int i;  
int a[5];  
int *p = a;
```



see
`compare{1,2}.c`, `pointers{1,2}.c`

Dynamic Memory Allocation

malloc

```
// instantiate memo
memo = (long long *) malloc((n+1) * sizeof(long long));
if (memo == NULL)
{
    printf("Out of memory!\n");
    return 2;
}
```

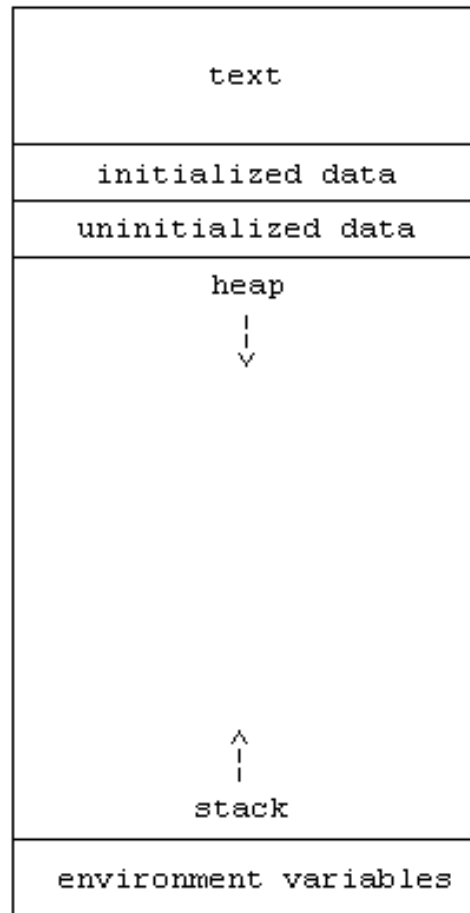
[...]

```
// free up memory
free(memo);
```

see
fs4.c, copy.c

Memory Management

Revisited



CS 50's Library

Revisited

```
:: bool  
:: string  
  
:: char GetChar();  
:: double GetDouble();  
:: float GetFloat();  
:: int GetInt();  
:: long long GetLongLong();  
:: string GetString();
```

see
`scanf{1,2,3}.c, ~cs50/pub/releases/cs50/cs50.{c,h}`

struct

(and header files)

```
typedef struct
{
    int id;
    char * name;
    char * house;
}
student;
```

see
structs1.c

File I/O

- :: `fopen/fclose`
- :: `fscanf/fprintf`
- :: `fread/fwrite`
- :: `feof`
- :: ...

see
`structs2.c`

The image is a promotional graphic for the television series 'CSI: Crime Scene Investigation'. It features a dark, moody background with a close-up of a person's face on the right side, partially obscured by shadows. On the left, there is a faint, glowing image of a human skeleton, specifically the spine and pelvis. Several thin, white lines radiate from a point in the upper center, suggesting a forensic analysis or investigation. The title 'CSI:' is prominently displayed in the lower center in a large, bold, white font. Below it, the words 'CRIME SCENE INVESTIGATION' are written in a smaller, white, sans-serif font.

CSI:

CRIME SCENE INVESTIGATION

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