

# Lecture 7

## CS 137

## Fall 2014

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## C Functions

Arguments to C functions are passed by value.

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```
void weird(int n){  
    n = 17;  
}
```

```
int main(void){  
    int m = 6;  
    weird(m);  
    printf("%d\n", m)  
    return 0;  
}
```

---

```
//array of ints  
int a[5] = {10, -7, 3, 8, 42}
```

```
//Add up elements
```

```
int sum( int a[], int n){  
    int total = 0, i = 0;  
  
    while(i < n){  
        total += a[i];  
        i++;  
    }  
  
    return total;  
}
```

---

```
for(initialization; condition, increment){  
    statement  
}
```

```
//equivalent to (sort of) =>  
initialization:
```

```
while(condition){  
    statement  
    increment  
}
```

---

```
int sum(int a[], int n){  
    int total = 0, i;  
    for(i = 0; i < n; i++){  
        total += a[i];  
    }  
  
    return 0;  
}
```

---

Array Initialization:

```
int a[5] = {-10, 15, 7, -3, 2}
```

a[5]

Allocate storage for array with five elements.

{-10, 15, 7, -3, 2}

Initialize values

```
int b[10] = {1, 2, 3}  
b[10] // size  
{1, 2, 3} //remaining elements are 0
```

```
int c[1000];  
uninitialized array (Values could be anything)
```

Problem find all prime numbers;  
up to a specified natural number.

Process:

1. Strike out all multiples of 2 except 2
  3. Find next highest number to strike out and take out multiples of that number
  4. repeat
- 

```
#include <stdio.h>
```

```
int main(void){  
    int i, n;  
    scanf("%d", &n);
```

```

    int a[n+1];

    sieve(a, n+1);

    for(i = 0; i < n; i++){
        if(a[i])
            printf("%d\n", a[i]);
    }
    return 0;
}

void sieve(int a[], int n){
    int i;
    if(n <= 0) return;
    a[0] = 0;
    if(n == 1) return;
    a[1] = 0;
    if(n == 2) return;
    for(i=2; i < n; i++){
        a[i] = 1;
    }

    for(i=2; i <= (n-1)/i ; i++){
        if(a[i]){
            int j;
            for(j = 2*i; j < n; j+=i){
                a[j] = 0 //strick out
            }
        }
    }
}

void clear(int a[], int n){
    int i;
    for(i = 0; i < n; i++){
        a[i] = 0;
    }
}

int main (void){
    int a[5] = {100, 200, 300, 400, 500}

    clear(a, 5);
}

```

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