2510 : Lecture 14 || Asn 1 Feb 10, 2017

Assignment 1

- test files uploaded [a1tests.zip]
- suggestion for asn1:
  - you need another version of get_int diff from lab

```
int get_int(const char prompt[], int *n);
```

  - the function returns 0 or 1; 0 on end-of-file
    1 when int is successfully read
  - the integer is passed back to the caller via n
    ?

is it clear... = Yes

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Pointers, Addresses & Arrays

An array name can be used as address. It is the starting address of the array.

* The starting address of an array is the address of the first element

```
int a[10];          int *p;
printf("%d", a == &a[0]); /* 1 */
p = &a[0];
p = a;
```

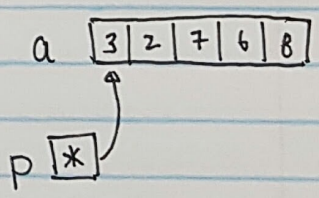
pointing to an array means the FIRST element of array.

We can think of p as pointing to the array; this actually means it's pointing to the first element of the array.

∴ A pointer to an int can point to an array of ints

- It turns out that we can use the index notation with a pointer:

```
int a[5] = {3, 2, 7, 6, 8};
int *p = a;
printf("%d", p[0]); /*3*/
printf("%d", p[1]; /*2*/
```



- Actually, we have been indexing pointers for a while

```
int arr_max(const int a[], size_t n) {
    size_t i;          const int *a
    int    max = a[0];
    for (i = 0; i < n; i++) {
        if (a[i] > max)          indexing pointer
            max = a[i]; }        [cont]
```

[cont...]

```
    return max;
}

int a[] = {3, 2, 7, 6, 8};
int max = arr_max (a, 5);
```

(a) address of array

easily confuse pointers w/ arrays

↳ since the 1st param of arr_max accepts an address, it must be a pointer.

As a function parameter : T a[] = T* a

(T: type)

- NOTE : pointers are not the SAME as arrays

▲ Example : the difference between pointers and arrays

array `char s[] = "hello";`
pointer `char *p = "world";`

```
p = s;   ✓
s = p;
```

s: array name (address)

DOES NOT COMPILE
- can't assign to address

is it different? yes.

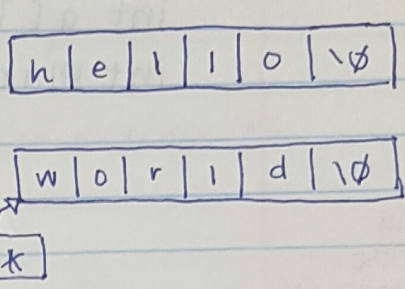
```
char s[] = "hello";
char *s = "hello";
printf("%s", s);
```

Analogy : pointer address vs.

`int n;` 123

continued...

```
s[0] = p[0]; /* changes 'h' to 'w' */
p[0] = s[0]; /* invalid! TRYING to change STRING CONST */
```



any attempt to change the string will lead to undefined behavior

midterm qs also on review exercise

▷ **Bit manipulation**

these and their variants ex. a&=b

- ~ complement → flip bits 0 ↔ 1
- <<
- >>
- &
- |
- ^

Typical questions:

- Assume 16-bit unsigned short:
  unsigned short n = 0xA2B3;
  Find ~n in hexadecimal.

n = 0xA2B3 = 1010 0010 1011 0011 → flip bits
~n = = 0101 1101 0100 1100 = 0x5D4C

don't count this