PLAN 396
Lecture 5

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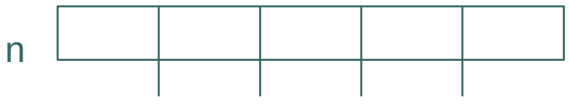
Arrays

- A group of variables placed consecutively in the memory
- Each variable in the array is called an element
- Each element can be addressed using an Integer addressing
- Array can be of any data types, i.e., int, char, float, etc.

Array Example

- int num[5]
  - Declares an array named num with 5 elements
  - 5 is the size of the array
- num[i] is the i-th element where 0<= i < size of array
  - num[0] is the first element
  - num[4] is the last element
- Each array element can be used as regular variable
  - num[0] = 5;
  - scanf(“%d”, &n[1]);

Array Example



Array Visual Example

- char name[100]
- int numbers[20]
  - What is the size of this array?
  - What is the size of this array in byte?
  - What is the last element?

Array and Loop

- Array are very useful for using with loops
- Loop index are generally used to address array elements
- Example

```
for(i =0; i<10; i++)
        scanf("%d", &num[i]);
```

Multi-Dimensional Array

- Array can be declared in multi dimension
- In general, more than 3 dimensional array is not used
- Example:
  - int var[x-axis][y-axis][z-axis]

a[0][0]	a[0][1]			a[0][4]
a[1][0]				
a[3][0]				a[3][4]

int a[4][5]

Generate Random Number

- Use stdlib library and rand() function
- rand() function returns a random number between 0 and $(2^{31}-1)$
- Example:

```
#include<stdlib.h>

int main(){
    int n = rand();
}
```

Class Assignment

- Write a program named assignment7.c
- The program should declare an array of 50 integers and generate 50 random numbers between 100 and 1000 as array elements
- The program should output using loop:
  - The generated numbers
  - The maximum of the numbers
  - The minimum of the numbers
  - The sum of the numbers
  - The average of the numbers