CSE 113 Structured Programming Language

ARRAY

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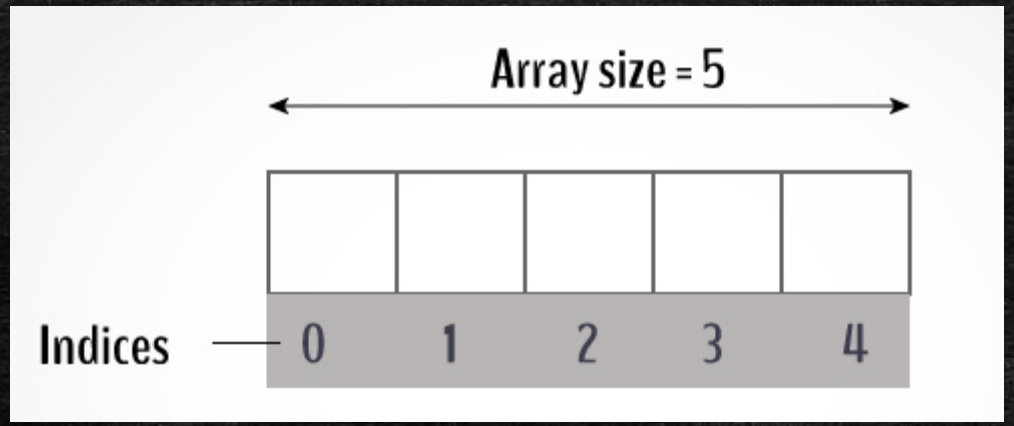
ARRAY Introduction

- An array is a variable that can store multiple values (same type)



ARRAY Declaration

dataType arrayName[arraySize];

```
float mark[5];
```

Array initialization

```
int mark[5] = {19, 10, 8, 17, 9};
int mark[] = {19, 10, 8, 17, 9};
```

Change Value of Array elements

```
int mark[5] = {19, 10, 8, 17, 9};
mark[2] = -5; // change the value of the third element to -5
mark[4] = 100; // change the value of the fifth element to 100
```

Changed values

Input and Output Array Elements

Input	// take input and store it in the 3rd index
	scanf("%d", &mark[2]);
	
	// take input using loop
	for(i=0; i<n; i++)
	  scanf("%d", &mark[i])

Output	// print the first element of the array
	printf("%d", mark[0]);
	
	// print the third element of the array
	printf("%d", mark[2]);
	
	// print n elements using loop
	for(i=0; i<n; i++)
	  printf("%d", mark[i])

```
int main() {
    int values[5];

    printf("Enter 5 integers: ");

    // taking input and storing it in an array
    for(int i = 0; i < 5; ++i) {
       scanf("%d", &values[i]);
    }

    printf("Displaying integers: ");

    // printing elements of an array
    for(int i = 0; i < 5; ++i) {
       printf("%d\n", values[i]);
    }
    return 0;
}
```

Multidimensional (2D) Array

```
float x[3][4];
```

	Column 1	Column 2	Column 3	Column 4
Row 1	x[0][0]	x[0][1]	x[0][2]	x[0][3]
Row 2	x[1][0]	x[1][1]	x[1][2]	x[1][3]
Row 3	x[2][0]	x[2][1]	x[2][2]	x[2][3]

Multidimensional (2D) Array

- Different ways to initialize two-dimensional array

```
int c[2][3] = {{1, 3, 0}, {-1, 5, 9}};

int c[][3] = {{1, 3, 0}, {-1, 5, 9}};

int c[2][3] = {1, 3, 0, -1, 5, 9};
```

Print 2D Array

```
#include <stdio.h>
int main()
{
  int row, col;
  int mat[3][2] = { {10, 20}, {30, 40}, {45, 70} };
  for (row = 0; row < 3; row++)
  {
      for (col = 0; col < 2; col++)
      {
            printf("%d\t",mat[row][col]);
      }
      printf("\n");
  }
  return 0;
}
```

2D Array (input, output)

```
main(){
    int a[10][10], row, col, r,c;
    printf("Enter row and column number: ");
    scanf("%d%d", &row,&col);
    for(r=0; r<row; r++){
        for(c=0; c<col; c++){
            scanf("%d", &a[r][c]);
        }
    }
    printf("Entered matrix:\n");
    for(r=0; r<row; r++){
        for(c=0; c<col; c++){
            printf("%d ", a[r][c]);
        }
        printf("\n");
    }
}
```