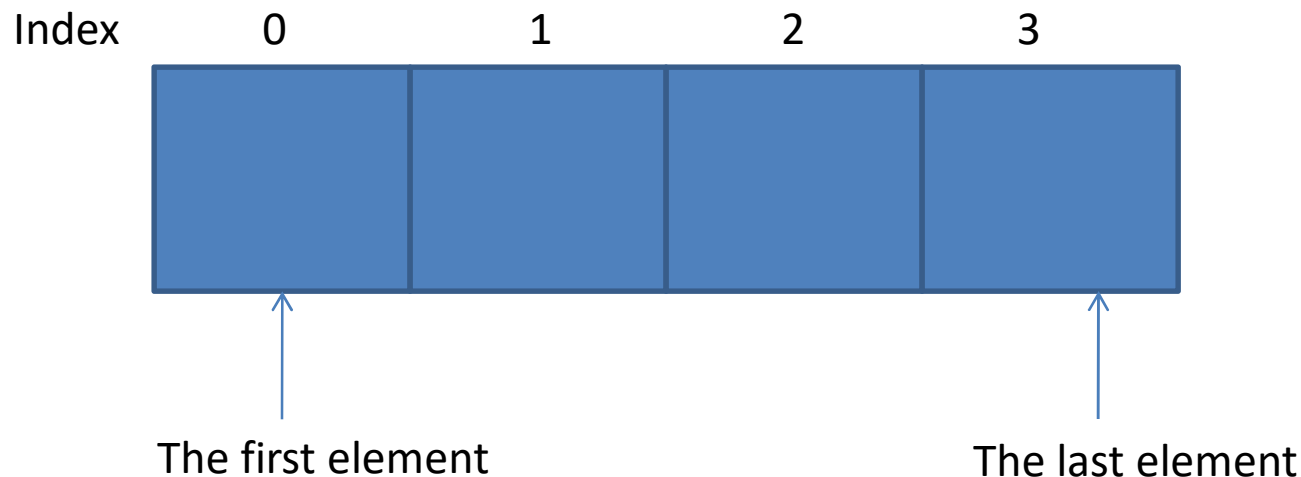


# Ch6: Arrays

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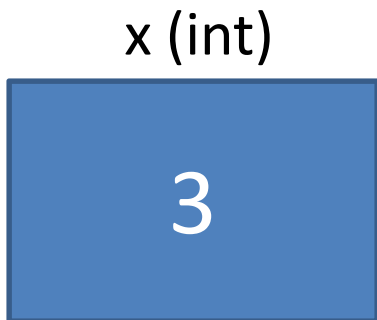
# What is Arrays?

- Arrays is a type of data structure that can store fixed-size elements of the same type.
- Arrays using index as an address to indicate each value in a collection.

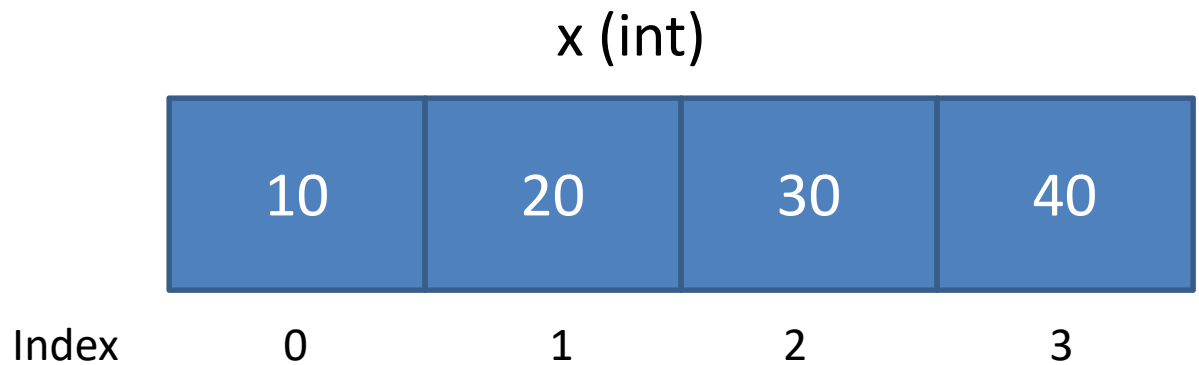


# Primary Type vs Arrays

```
int x ;  
x= 3;
```



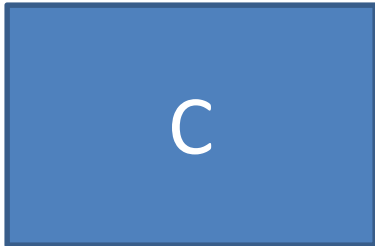
```
int x[4];  
x[0]= 10;  
x[1] = 20;  
x[2]= 30;  
x[3] = 40;
```



# Primary Type vs Arrays

```
char letter;  
letter = 'C';
```

letter (char)



```
char letter[5];  
letter[0] = 'C';  
letter[1] = 'O';  
letter[2] = 'M';  
letter[3] = 'P';  
letter[4] = 'R';
```

letter (char)



Index

0

1

2

3

4

# How to declare arrays?

```
#include <stdio.h>

int main()
{
    char text[30]="Hello World";

    float num[3];
    num[0]=10.5;
    num[1]=3.7;

    printf("%s \n",text);
    printf("%f , %f , %f \n",num[0],num[1],num[2]);

    return 0;
}
```

Data  
type

Variable  
name

Size of  
arrays

# How to use arrays?

```
int main()
{
    int x[5]={1,2,3,4,5};

    float y[2];
    y[0]=3.3;
    y[1]=5.5;
    y[2]=7.0;

    _Bool status[6]={0,1,0,1};

    printf("%d \n",x[3]);
    printf("%f \n",y[1]);
    printf("%d , %d \n",status[1],status[8]);

    return 0;
}
```

Assign value by specify to each index of array

Assign value when we declare (each value assigns to each index accordingly)

Error: y has no index 2. y has index only 0,1

Only index 0-3 are assigned value. Index 4,5 still be empty

Error: status has no index 8. it has index 0-5

# Practice with Loop 1

Receive 5 integer numbers from keyboard

```
int main()
{
    int x[5];
    printf("Enter a number: ");
    scanf("%d",&x[0]);
    printf("Enter a number: ");
    scanf("%d",&x[1]);
    printf("Enter a number: ");
    scanf("%d",&x[2]);
    printf("Enter a number: ");
    scanf("%d",&x[3]);
    printf("Enter a number: ");
    scanf("%d",&x[4]);

    return 0;
}
```

Exercise: Receive 8 floating numbers from keyboard

# Practice with Loop 1

Receive 5 integer numbers and find the summation

```
int main()
{
    int x[5];
    printf("Enter a number: ");
    scanf("%d",&x[0]);
    printf("Enter a number: ");
    scanf("%d",&x[1]);
    printf("Enter a number: ");
    scanf("%d",&x[2]);
    printf("Enter a number: ");
    scanf("%d",&x[3]);
    printf("Enter a number: ");
    scanf("%d",&x[4]);

    printf("Summation = %d\n",x[0]+x[1]+x[2]+x[3]+x[4]);
    return 0;
}
```



# Practice with Loop 1

Receive 5 integer numbers and find the summation

```
int main()
{
    int x[5];
    int i;
    for(i=0;i<5;i++)
    {
        printf("Enter a number: ");
        scanf("%d",&x[i]);
    }
    printf("Summation = %d\n",summation(x));
    return 0;
}
```

# Practice with Loop 1

Receive 5 integer numbers and find the summation

```
int summation(int num[]){
    int i=0,sum=0;
    while(i<5){
        sum=sum+num[i];
        i++;
    }
    return sum;
}
```

# Practice with Loop 2

Receive 10 integers  
and count the  
number of odd  
numbers

Exercise: Receive  
10 floating  
numbers and  
count the number  
of positive  
numbers

```
int count(int num[]){
    int i=0,count=0;
    while(i<10){
        if(num[i]%2!=0){
            count=count+1;
        }
        i++;
    }
    return count;
}

int main()
{
    int x[10];
    int i;
    for(i=0;i<10;i++)
    {
        printf("Enter a number: ");
        scanf("%d",&x[i]);
    }
    printf("The number of odd = %d\n",count(x));
    return 0;
}
```

# Practice with Tic-Tac-Toe

Exercise : To find .....Does X/O win?

Receive 3 integers

the input number can be only 1 or 2 (1=X, 2=O)  
and check whether all 3 are the same number.

Example of Output

Input = 1 1 1

X wins!!!

Input = 2 2 2

O wins!!!

Example of Output

Input = 1 2 1

Not win

Input = 2 1 1

Not win