Ch6: Arrays

305171 Computer Programming
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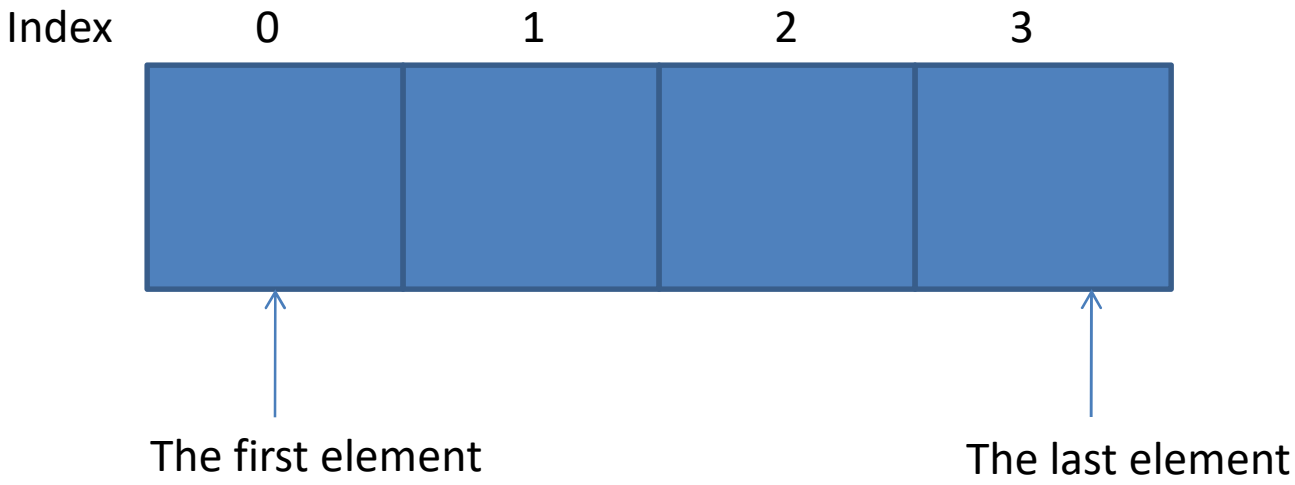
What is Arrays?

- 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.



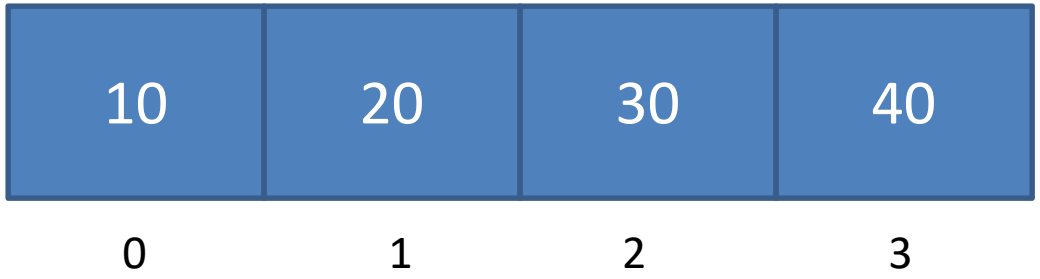
Primary Type vs Arrays

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

x (int)


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

x (int)

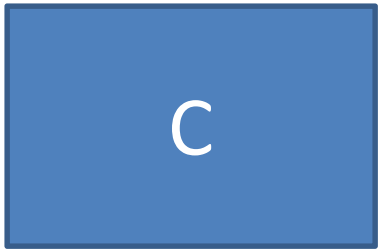


Primary Type vs Arrays

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

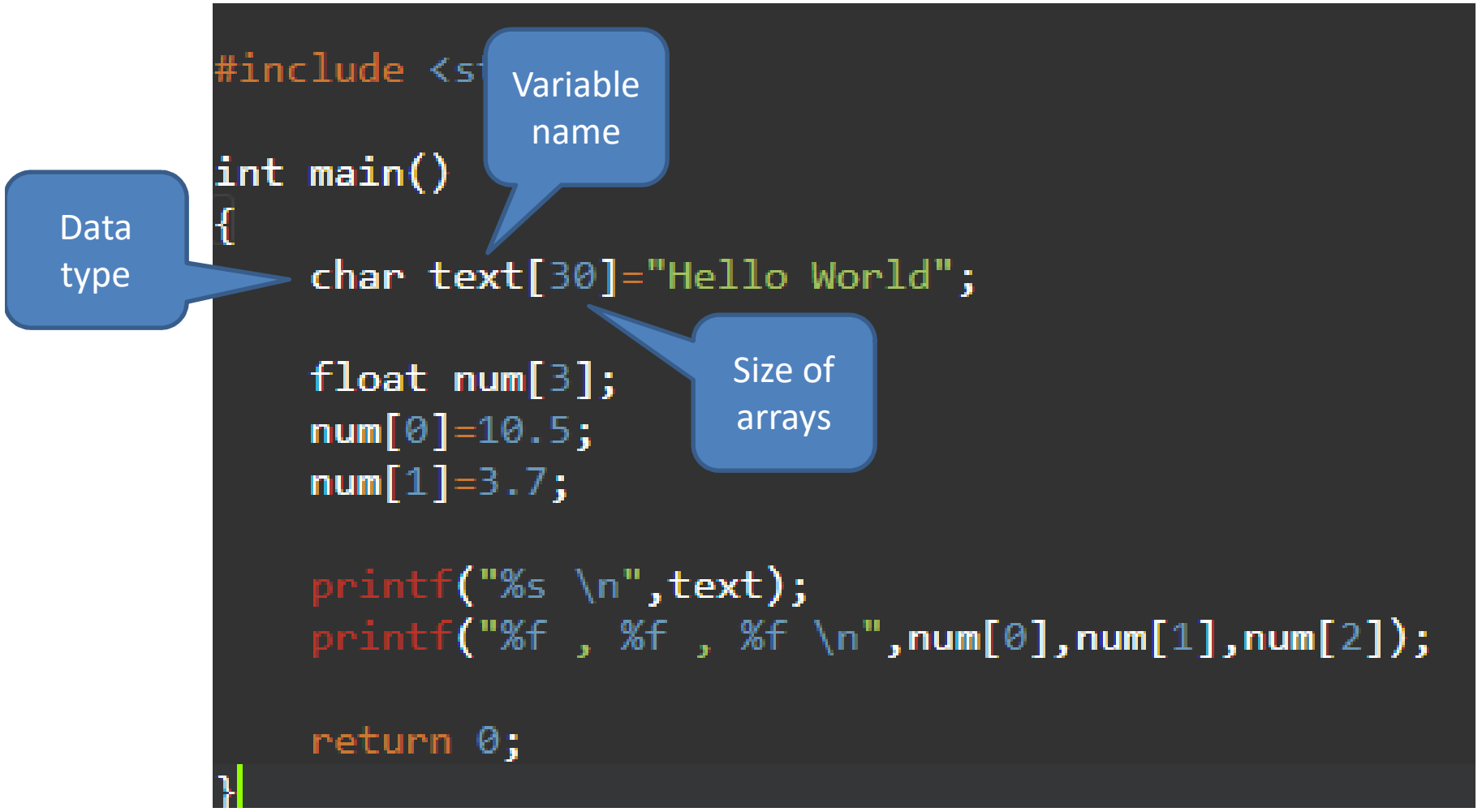
```
char letter[5];
letter[0]= 'C';
letter[1] = 'O';
letter[2]=  'M';
letter[3] = 'P';
letter[4] = 'R';
```

letter (char)

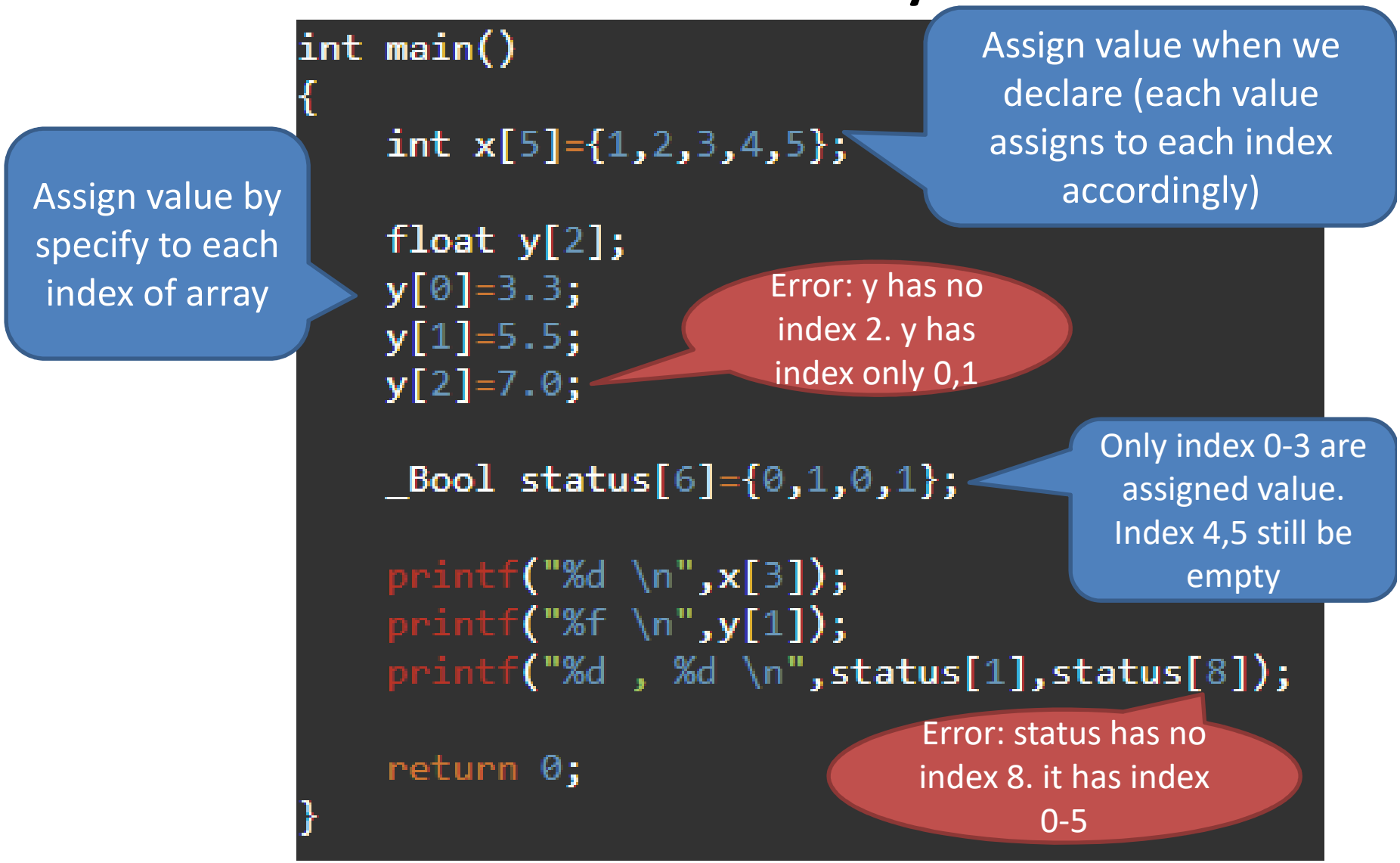


letter (char)

How to declare arrays?



How to use arrays?



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

```c
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

```
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;
}
```

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

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