

VE280 Recitation Class 1

Mao Junxiong

2016-5-30

Passing a Multidimensional Array

- Passing a one dimensional array: `void print(int matrix[], int size)`
- Passing a two dimensional array: `void print(int (*matrix)[10], int rowSize)`, it is equivalent to `void print(int matrix[][10], int rowSize)`

Question

What's the difference?

- `int *matrix[10]`
- `int (*matrix)[10]`
- How to pass a three-dimensional array: `cube[3][4][5]`?

Answer

- `int *matrix[10]` indicates an array of 10 pointers.
 - `int (*matrix)[10]` indicates a point to an array of 10 integers.
 - `void print(int (*cube)[3][4], int layerNum)`
-
- How to dynamically create a two-dimensional array?
 - Can be passed by: `void print(int **matrix, int row, int column)`
 - Don't forget to delete memory in case of memory leak.

Dynamically allocated 2D array

```
int **matrix = new int *[row];  
for (int i = 0; i < row; i++) {  
    matrix[i] = new int[column];  
}
```

Function that returns a reference

Returns a reference of the shorter string

```
const string &shorterString(const string &s1,  
const string &s2) {  
    return s1.size() <= s2.size() ? s1 : s2;  
}
```

- Never return a reference or a pointer to a local object.

What does this function do?

```
int &get(int *arr, int index) {return arr[index]; }  
int main() {  
    int arr[10];  
    for (int i = 0; i < 10; i++) { get(arr, i) = i; }  
}
```

Joke time

Q: What's a programmer's favorite hangout place?

A: Foo Bar.

File stream

- `fstream fs;;` Creates an unbound file stream.
- `fstream fs(s);;` Creates an `fstream` and opens the file named `s`, with default mode (For `ifstream` is `in`, for `ofstream` is `out`).
- `fstream fs(s, mode);;` Creates an `fstream` with mode `mode`.
- File modes:
 - `in`: Open for input.
 - `out`: Open for output.
 - `app`: Seek to the end before every write.
 - `ate`: Seek to the end immediately after the open.
 - `trunc`: Truncate the file (by default it automatically accompanies with `out` mode).
 - `binary`: Do IO operations in binary mode.
- Open a file with multiple modes: `ofstream out("file",
ofstream :: out | ofstream :: app);`.

Joke time

Q: What do computers and air-conditioners have in common?

A: They both become useless when you open windows.

Reference: C++ Primer 5th. edition.