

Brief Intro to C (II)

Array

- Can use stack memory or heap memory.
 - stack memory: `int a [5];`
 - access array elements by using array index: `a[i]`
 - heap memory: `int *b = malloc(5 * sizeof(int));`
 - access array element by using pointer: `*(b+i)`

```
#include <stdio.h>
#include <stdlib.h>

int main () {
    int i;

    // Way 1: create in stack
    int a[5];

    for (i = 0; i < 5; i++) {
        a[i] = i * 10;
    }

    for (i = 0; i < 5; i++) {
        printf("%d ", a[i]);
    }

    printf("\n");

    // Way 2: create in heap
    int *b;
    b = (int *)malloc(5 * sizeof(int));

    for (i = 0; i < 5; i++) {
        *(b+i) = i * 100;
    }

    for (i = 0; i < 5; i++) {
        printf("%d ", *(b+i));
    }

    free(b);

    printf("\n");

    return 0;
}
```

String

- There is no type “string” in C.
- To represent a string, we use a char array.
- Strings in C terminates with “\0”, so the size of a string is one more than the number of characters the string has.

```
#include <stdio.h>

int main (int argc, char *argv[]) {
    char string[] = "Hello world!";

    int i = sizeof(string)/sizeof(char);
    printf("size of the string: %d\n", i);

    for (int j = 0; string[j] != '\0'; j++) {
        printf("%d ", string[j]);
    }
    printf("\n");
}
```