

Tutorial 5

Strings and debugging

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Define a string

1. Using an array

```
char str[20];  
scanf("%s", str);
```

2. Using a pointer

```
char *str;  
str = malloc(20*sizeof(char));  
scanf("%s", str);
```

3. const string

```
char *str = "This is a string";  
printf("%s", str);
```

String functions

1	strcpy(s1, s2); Copies string s2 into string s1.
2	strcat(s1, s2); Concatenates string s2 onto the end of string s1.
3	strlen(s1); Returns the length of string s1.
4	strcmp(s1, s2); Returns 0 if s1 and s2 are the same; less than 0 if s1<s2; greater than 0 if s1>s2.
5	strchr(s1, ch); Returns a pointer to the first occurrence of character ch in string s1.
6	strstr(s1, s2); Returns a pointer to the first occurrence of string s2 in string s1.

2D string and 2D array

- Define 2D string

```
char str[5][30];  
scanf("%s", str[0]);  
scanf("%s", str[1]);  
scanf("%c", &str[2][0]);  
printf("%c", str[2][0]);
```

- Passing a string to a function

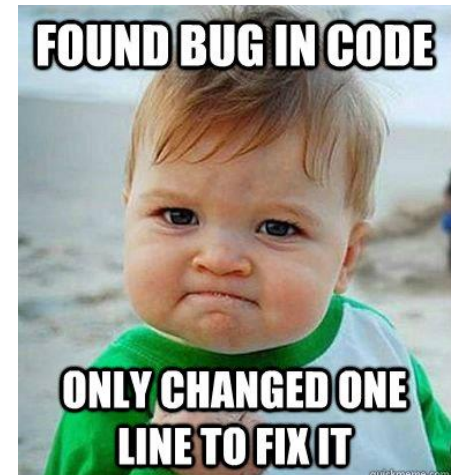
```
void func( char str* );
```

Debugging

- *Debugging is the process of finding and resolving of defects that prevent correct operation of computer software or a system. Debugging tends to be **harder** when various subsystems are tightly coupled, as changes in one may cause bugs to emerge in another.*
- When should we start debugging?

How to debug a program

- Know the meaning of compiler messages
- Print out states (values & addresses)
- Use test cases
- Divide and conquer



Exercise for you

A program with the name 'incorrect.c' is available on the Moodle page. Try to find out bugs in the program. The program first reads an array from user input, then sort the array to ascending and descending orders by calling two functions.