

C Programming Language

JANUARY 2, 2015

Today's task

- C FILE I/O
- Command line arguments
- Make a simple encryption/decryption program

File I/O ---Open a file

```
FILE *file4read    = fopen("test.txt","r");  
FILE *file4write   = fopen("out.txt","w");
```

r - open for reading

w - open for writing (file need not exist)

a - open for appending (file need not exist)

r+ - open for reading and writing, start at beginning

w+ - open for reading and writing (overwrite file)

a+ - open for reading and writing (append if file exists)

File I/O ---Read a file

- fscanf()
 - read a string from file
 - similar to scanf()
- fgetc()
 - read a character one by one in the file
 - return an int in range of 0~255
 - when at the end of the file, return EOF

```
fscanf(file4read,"%s %d%s",str,&x,str2)
```

```
x = fgetc(file4read)
```

File I/O ---Write a file

- `fprintf`
 - write a string to the file
 - similar to `printf`
- `fputc`
 - write a character to the file
 - `x1` should be in range 0~255

```
fputc(x1,file4write);
```

Task

- Open a file (plaintext), read content one by one
- Encrypt the content
- Write in another file (ciphertext)

Command Line Argument

```
int main(int argc, char *argv[])
```

- argc: the **argument count**
- argv: a list of the **argument variables**

Specify the plaintext file and output file

```
int main(int argc, char* argv[])
{
    if(argc != 3)
    {
        printf("usage: %s plaintext outfile",argv[0]);
    }
    else
    {
        FILE *plaintext    = fopen(argv[1],"r");
        FILE *ciphertext   = fopen(argv[2],"w");
        ...
    }
    return 0;
}
```


Homework

- ★ We' ve already make a program to encrypt message, make another program to decrypt the code text to plaintext , also the program should support command line argument
- ★ ★ The encryption method we just used is called Caesar cipher(http://en.wikipedia.org/wiki/Caesar_cipher), it is old and easy to hack. Think about it, how to hack Caesar cipher?
- ★ ★ ★ Caesar cipher is not safe, but another cipher called Vigenère cipher(http://en.wikipedia.org/wiki/Vigen%C3%A8re_cipher) based on Caesar cipher is more complex and hard to hack. If you are interested, program it.

Next time

- We make the encryption program in GUI with gtk