CS202 Discussion

Review Session 2

- [x] 0. Record
- [ ] 1. C Review (continued)
- [ ] 2. Lab 2 overview
- [ ] 3. Q & A

"There's no magic in systems"

"... except in baking" - Khanh

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1. String Concatenation

```
int snprintf(char * str, size_t size,
             const char * format, ...)
```

char * str: a buffer === destination of where to write

size_t size: maximum number of bytes that's written to the buffer

format: C string that contains format specifications like printf

... : optional argument

... Optional argument

%s %d.

man printf

man snprintf

snprintf(buffer, 20, "%s %s %s",
str1, str2, str3);

↳ buffer contains the formatted string.

Q: What should be SIZE_TO_WRITE?

-> 12.

- Struct

```
struct student{
    int age;
    char* name;
};
```

- Initialization

```
struct Student Alice;
Alice.age = 20;
Alice.name = "Alice";
```

Accessing members

"." : dot operator.


```
struct * pAlice = &Alice;
(*pAlia).age;
```

or

```
pAlice -> age;
```

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2. Lab 2 Overview

- Motivation

- What does "ls" do? ls -flag(s) [Arguments]

- File definition : test.txt, main.c, dir/

Pseudo files/dir: starts with .

.git ← git info is stored.

. : refers to current directory

.. : refers to parent directory.

./ls ./a.out → relative path:

../a.out: lives in the parent dir with repeat to ther current dir

- File permissions
- Flag / Options → rwx --- --- --- (usr group global)

dir/file

./ls -alR foo/

Exe. Flag Arguments

chmod 700 main.c.

700 → f: 111 rwx

1 1 usr group global

770 rwx for group.

- getopt & getopt_long

```
int getopt (int argc, char * const argv[],
            const char * optstring )
```

main (argc, argv)

argc : # of arguments
argv: the arguments themselves } obtained from main function

optstring: the parameter we want to parse

optind: a global variable specifying the index to use getopt next time. Initial value is 1

↳ man getopt

- if getopt() finds another option character, returns 0, getopt() returns -1. otherwise.

→ while (getopt_long (...) != -1) {

:

- if optind == argc then it means no arguments → optind = 2.

after the flags were given. ./ls =

- Otherwise, arguements indexed from optind to argc - 1 are all of the arguments after the flag.

./ls -i foo bar
↑
optind ⟶ argc

getopt_long: parse long option : --[Flag]
ls --help

- Directory-related functions

Opendir: opens a directory stream corresponding to the directory name & returns pointer to the stream — path/d_name

Readdir: returns a pointer to a dirent structure, representing the next directory entry in the stream.

Closedir: Closes the associated directory stream.

↳ man dirent

Logic ?

opendir ⟶ Readdir ⟶ Closedir

↳ More complicated :(

always call if you open.

- Helper functions :

3. Q & A

```c
#include <stdio.h>

struct student {
    char * name;
    int age;
};

int main()
{
    struct student alice;
    alice.name = "Alice";
    alice.age = 22;

    printf("name: %s. age: %d\n", alice.name, alice.age);

    struct student *pstudent = &alice;
    printf("name: %s. age: %d\n", pstudent->name, pstudent->age);

}

```

```c
#include <stdio.h>

int main()
{
    char buffer[50];
    char* first = "Hello"; // Length: 5 excluding null byte
    char* second = "World"; // Length: 5 excluding null byte
.
    // Counting the character and storing
    // in buffer using snprintf
    int i = snprintf(buffer, SIZE_TO_WRITE, "%s %s", first, second);
.
    printf("Result: %s\n", buffer);
.
    return 0;
}

```

Hello world

size_to_write =

len(first) + 1 + len(second)

= 11 + null byte = 12.