

HW7: Function pointer and void pointer

Class number: 060

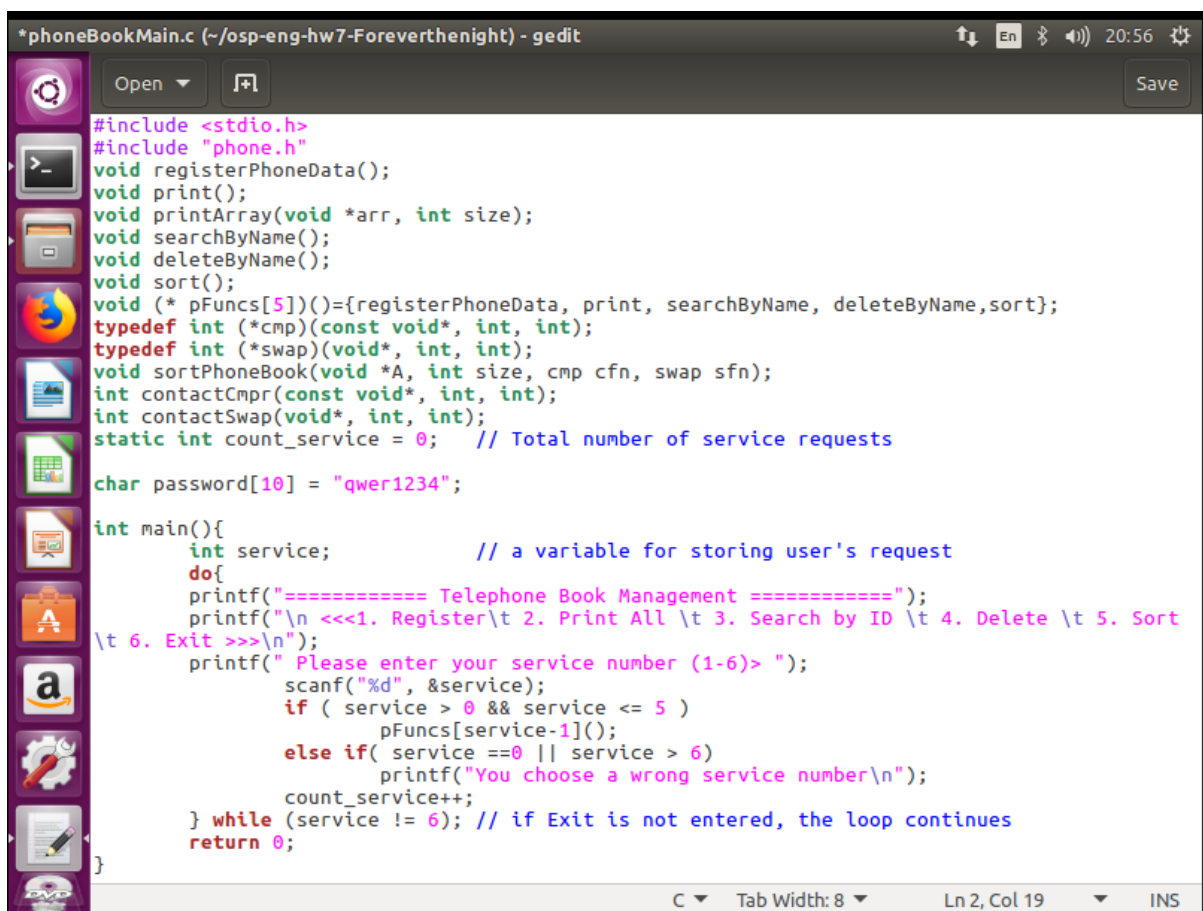
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1. Explanation for your codes (60 Points)



```
*phoneBookMain.c (~/osp-eng-hw7-Foreverthenight) - gedit
#include <stdio.h>
#include "phone.h"
void registerPhoneData();
void print();
void printArray(void *arr, int size);
void searchByName();
void deleteByName();
void sort();
void (* pFuncs[5])()={registerPhoneData, print, searchByName, deleteByName,sort};
typedef int (*cmp)(const void*, int, int);
typedef int (*swap)(void*, int, int);
void sortPhoneBook(void *A, int size, cmp cfn, swap sfn);
int contactCmpr(const void*, int, int);
int contactSwap(void*, int, int);
static int count_service = 0; // Total number of service requests

char password[10] = "qwer1234";

int main(){
    int service; // a variable for storing user's request
    do{
        printf("===== Telephone Book Management =====");
        printf("\n <<<1. Register\t 2. Print All \t 3. Search by ID \t 4. Delete \t 5. Sort\n\t 6. Exit >>>\n");
        printf(" Please enter your service number (1-6)> ");
        scanf("%d", &service);
        if ( service > 0 && service <= 5 )
            pFuncs[service-1]();
        else if( service ==0 || service > 6)
            printf("You choose a wrong service number\n");
        count_service++;
    } while (service != 6); // if Exit is not entered, the loop continues
    return 0;
}
```

phoneBookMain.c runs mostly by invoking functions of other .c files, so it contains extern to use registerPhoneData(), printAll(), searchByName(), deleteByName() of other files.

In the main function of phoneBookMain.c, I is used of storing user's request. Here is a do-while circulation to make sure it running until users make it stop.

```

*register.c (~/.hw-test-Foreverthenight/hw6) - gedit
#include <stdio.h>
#include <string.h>
#include "phone.h"

extern struct Contact PhoneBook[MAX];
extern char password[10];

void registerPhoneData(){
    char inputPassword[100];
    int wrongCount = 0;
    do{
        printf("Password: ");
        scanf("%s", inputPassword);

        if (strcmp(password, inputPassword) != 0){
            wrongCount++;
            switch(wrongCount){
                case 1: printf(">>Not Matched !!!\n"); break;
                case 2: printf(">>Not Matched (twice) !!!\n"); break;
                case 3: printf(">>Not Matched (3 times) !!!\n"); break;
            }
        }

        if (wrongCount == 3){
            printf(">>You are not allowed to access PhoneBook.\n");
            return ;
        }
    } while (strcmp(password, inputPassword) != 0);

    printf("New User Name: ");
    scanf("%s", PhoneBook[size].Name);
    printf("PhoneNumber: ");
    scanf("%s", PhoneBook[size].PhoneNumber);
    printf("Registered...\n");
    size++;

    return ;
}

```

There is two parts in register.c, firstly determine if input password is true, and then register user information if password is true.

Inputpassword[100] stores the password inputted by user, wrongCount stores times that password wrong.

```

print.c (~/.osp-eng-hw7-Foreverthenight) - gedit
#include <stdio.h>
#include "phone.h"

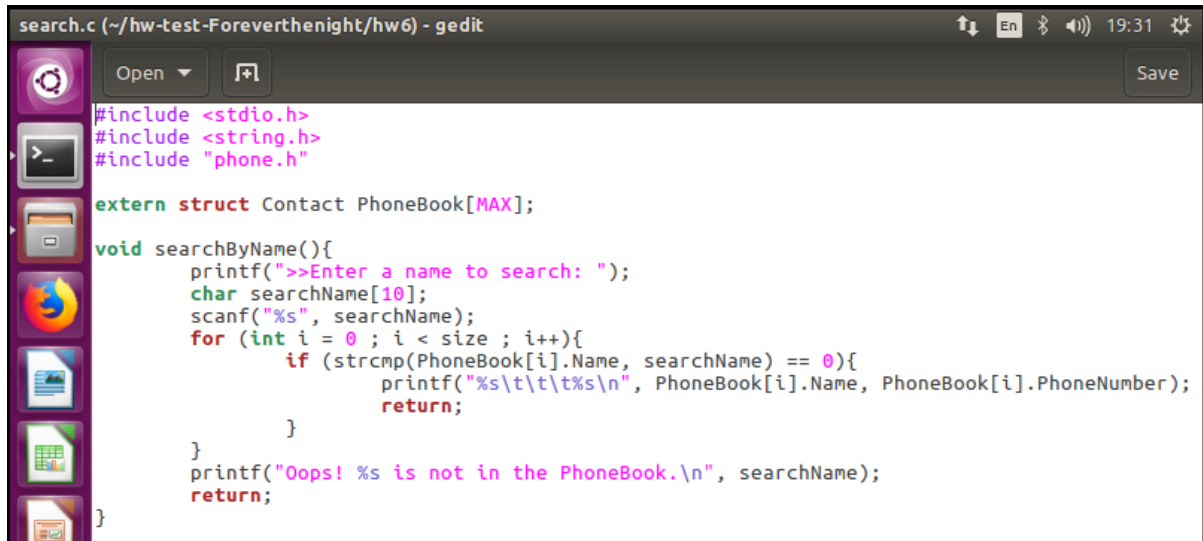
extern struct Contact PhoneBook[MAX];

void print(){
    printf("Print all contents in the PhoneBook\n");
    printArray(PhoneBook, count_service);
}

void printArray(void *arr, int size){
    int i;
    void *p;
    p = arr;
    for(i=0; i<size; i++){
        printf("Addr vp:%p\t", (Contact*)p+i);
        printf("name:%s\t phone:%s\n", ((Contact*)p+i)->Name, ((Contact*)p+i)->PhoneNumber);
    }
    printf("\n");
}

```

Calling printArray to print all the contacts.

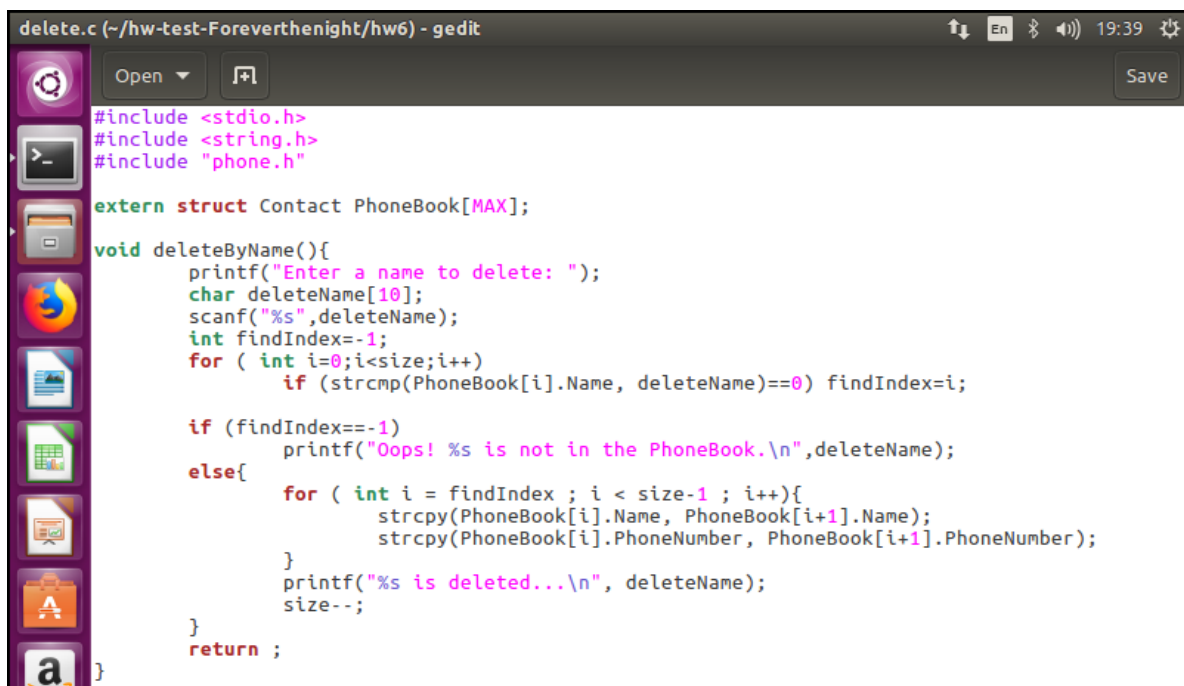


```
search.c (~/.hw-test-Foreverthenight/hw6) - gedit
#include <stdio.h>
#include <string.h>
#include "phone.h"

extern struct Contact PhoneBook[MAX];

void searchByName(){
    printf(">>Enter a name to search: ");
    char searchName[10];
    scanf("%s", searchName);
    for (int i = 0 ; i < size ; i++){
        if (strcmp(PhoneBook[i].Name, searchName) == 0){
            printf("%s\t\t\t%s\n", PhoneBook[i].Name, PhoneBook[i].PhoneNumber);
            return;
        }
    }
    printf("Oops! %s is not in the PhoneBook.\n", searchName);
    return;
}
```

In the searchByName(), for circulation let the name compared one by one, and then print the matched name.



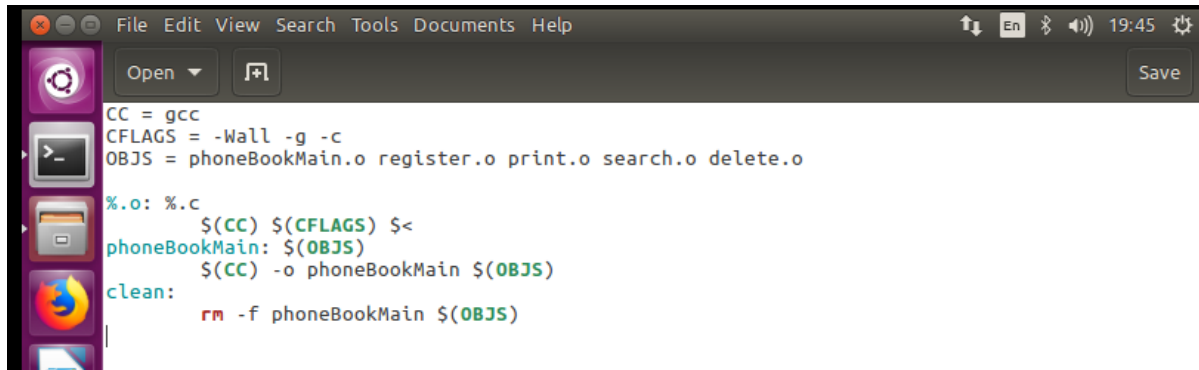
```
delete.c (~/.hw-test-Foreverthenight/hw6) - gedit
#include <stdio.h>
#include <string.h>
#include "phone.h"

extern struct Contact PhoneBook[MAX];

void deleteByName(){
    printf("Enter a name to delete: ");
    char deleteName[10];
    scanf("%s", deleteName);
    int findIndex=-1;
    for ( int i=0;i<size;i++)
        if (strcmp(PhoneBook[i].Name, deleteName)==0) findIndex=i;

    if (findIndex==-1)
        printf("Oops! %s is not in the PhoneBook.\n", deleteName);
    else{
        for ( int i = findIndex ; i < size-1 ; i++){
            strcpy(PhoneBook[i].Name, PhoneBook[i+1].Name);
            strcpy(PhoneBook[i].PhoneNumber, PhoneBook[i+1].PhoneNumber);
        }
        printf("%s is deleted...\n", deleteName);
        size--;
    }
    return ;
}
```

First of all, search if there exist a matched name, and delete the matched information, print out error message if not.



```
File Edit View Search Tools Documents Help
Open [icon] Save

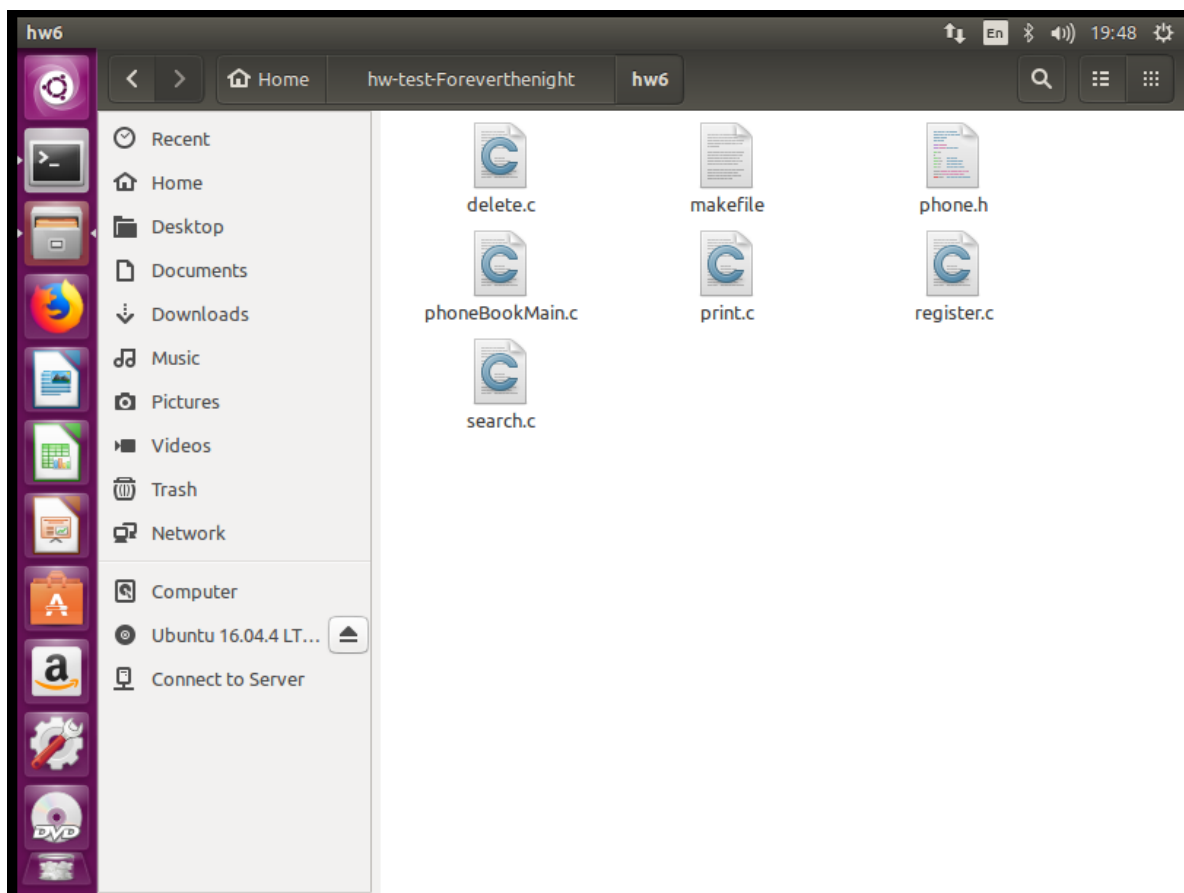
CC = gcc
CFLAGS = -Wall -g -c
OBJS = phoneBookMain.o register.o print.o search.o delete.o

%.o: %.c
$(CC) $(CFLAGS) $<
phoneBookMain: $(OBJS)
$(CC) -o phoneBookMain $(OBJS)
clean:
rm -f phoneBookMain $(OBJS)
```

In the first two lines, using macro the replays some long options.

%o:%c means all the .c files is prerequisite of the corresponding .o files.

2. Program Execution (10 points)



```
Terminal
hufq@hufq-virtual-machine: ~/hw-test-Foreverthenight/hw6

hufq@hufq-virtual-machine:~/hw-test-Foreverthenight/hw6$ make
gcc -Wall -g -c phoneBookMain.c
gcc -Wall -g -c register.c
gcc -Wall -g -c print.c
gcc -Wall -g -c search.c
gcc -Wall -g -c delete.c
gcc -o phoneBookMain phoneBookMain.o register.o print.o search.o delete.o
hufq@hufq-virtual-machine:~/hw-test-Foreverthenight/hw6$ ./phoneBookMain

===== Telephone Book Management =====
<<<1.Register 2.Print All 3.Search by ID 4.Delete 5.Exit >>>
Please enter your service number (1-5)> ^C
hufq@hufq-virtual-machine:~/hw-test-Foreverthenight/hw6$
```

3. Github repository(20 points)

```
hufq@hufq-virtual-machine: ~/osp-eng-hw7-Foreverthenight

hufq@hufq-virtual-machine:~/osp-eng-hw7-Foreverthenight$ touch sort.c
hufq@hufq-virtual-machine:~/osp-eng-hw7-Foreverthenight$ gedit sort.c
hufq@hufq-virtual-machine:~/osp-eng-hw7-Foreverthenight$ git add *.c
hufq@hufq-virtual-machine:~/osp-eng-hw7-Foreverthenight$ git add *.h
hufq@hufq-virtual-machine:~/osp-eng-hw7-Foreverthenight$ git add makefile
hufq@hufq-virtual-machine:~/osp-eng-hw7-Foreverthenight$ git status
On branch master
Your branch is up-to-date with 'origin/master'.
Changes to be committed:
  (use "git reset HEAD <file>..." to unstage)

    new file:   delete.c
    new file:   makefile
    new file:   phoneBookMain.c
    new file:   print.c
    new file:   register.c
    new file:   search.c
    new file:   sort.c

Changes not staged for commit:
  (use "git add/rm <file>..." to update what will be committed)
```

```

hufq@hufq-virtual-machine:~/osp-eng-hw7-Foreverthenight$ git commit -m "c source
file"
[master da00a1a] c source file
7 files changed, 178 insertions(+)
create mode 100644 delete.c
create mode 100644 makefile
create mode 100644 phoneBookMain.c
create mode 100644 print.c
create mode 100644 register.c
create mode 100644 search.c
create mode 100644 sort.c
hufq@hufq-virtual-machine:~/osp-eng-hw7-Foreverthenight$ git push -f pb master
fatal: 'pb' does not appear to be a git repository
fatal: Could not read from remote repository.

Please make sure you have the correct access rights
and the repository exists.
hufq@hufq-virtual-machine:~/osp-eng-hw7-Foreverthenight$ git push -f origin mast
er
Username for 'https://github.com': Foreverthenight
Password for 'https://Foreverthenight@github.com':
Counting objects: 9, done.
Compressing objects: 100% (9/9), done.
Writing objects: 100% (9/9), 2.79 KiB | 0 bytes/s, done.
Total 9 (delta 0), reused 0 (delta 0)
To https://github.com/pnssystemprog/osp-eng-hw7-Foreverthenight.git
dc54092..da00a1a master -> master
hufq@hufq-virtual-machine:~/osp-eng-hw7-Foreverthenight$

```

4. Discussion (10 points)

```

hufq@hufq-virtual-machine:~/hw-test-Foreverthenight
hufq@hufq-virtual-machine:~/hw-test-Foreverthenight$ git config --global user.name "hufq"
hufq@hufq-virtual-machine:~/hw-test-Foreverthenight$ git commit -m "Add a source codes"
[master (root-commit) 9173603] Add a source codes
warning: CRLF will be replaced by LF in delete.c.
The file will have its original line endings in your working directory.
warning: CRLF will be replaced by LF in hw6/phone.h.
The file will have its original line endings in your working directory.
warning: CRLF will be replaced by LF in manual_list.c.
The file will have its original line endings in your working directory.
warning: CRLF will be replaced by LF in phone.h.
The file will have its original line endings in your working directory.
warning: CRLF will be replaced by LF in phoneBookMain.c.
The file will have its original line endings in your working directory.
warning: CRLF will be replaced by LF in print.c.
The file will have its original line endings in your working directory.
warning: CRLF will be replaced by LF in push_double_list.c.
The file will have its original line endings in your working directory.
warning: CRLF will be replaced by LF in push_list.c.
The file will have its original line endings in your working directory.
warning: CRLF will be replaced by LF in register.c.
The file will have its original line endings in your working directory.
warning: CRLF will be replaced by LF in search.c.
The file will have its original line endings in your working directory.
11 files changed, 286 insertions(+)
create mode 100644 delete.c

```

Reason:

CRLF : linebreak of windows

LF : linebreak of linux

Solution:

Using command `git config core.autocrlf false` to make it work.