Center of Information Technology and Scientific Computing

Department of Software Engineering

System Programming

Lab 6

Prepared by:

Hanan Mohsin

ATR/1489/09

Section-2

Date: 12/04/19

The program declares a structure type of w_type (to mean weather type), it also gives an alias to this structure type using typedef statement. The new alias is WeatherDay.

1.
```
  GNU nano 2.9.3                        weatherday.c

#include <stdio.h>
#include <stdlib.h>
#define SIZE 5
struct w_type{
        int highTemp;
        int lowTemp;
        double precipitation;
};
typedef struct w_type WeatherDay;

void printWD(WeatherDay *day){
        printf("\nDisplaying:\n");
        printf("highTemp: %d\n", day->highTemp);
        printf("lowTemp: %d\n", day->lowTemp);
        printf("precipitation: %lf", day->precipitation);
}
float avgTemp(WeatherDay *Day){
        double avg = 0.0;
        avg = (Day->highTemp + Day->lowTemp)/2.0;
        printf("\nAverage: %lf\n",avg);
        return 0.0;
}
```

2.
```
void intialize(WeatherDay *day){
        printf("Enter highTem: ");
        scanf("%d",&day->highTemp);

        printf("Enter lowTemp: ");
        scanf("%d",&day->lowTemp);

        printf("Enter precipitation: ");
        scanf("%lf",&day->precipitation);
}
```

3.
```c
int main(){
        WeatherDay *dayptr, day1, *ptr,*ptr3;
        dayptr = &day1;
        intialize(dayptr);
        printWD(dayptr);
        avgTemp(dayptr);

        ptr = (WeatherDay*) malloc(SIZE * sizeof(WeatherDay));
        ptr3 = ptr + 2;
        ptr3->highTemp = 90;
        ptr3->lowTemp = 20;
        ptr3->precipitation = 45.8;
        printf("\nFor the third element in the WeatherDay array");
        printWD(ptr3);
        avgTemp(ptr3);
        for(int i = 0; i < SIZE; i++){
                (ptr+i)->highTemp = 0;
                (ptr+i)->lowTemp = 0;
                (ptr+i)->precipitation = 0.0;
        }
        free(ptr);
        return 0;
}
```

Output

1.
```
hanan@ubuntu:~/lab6$ ./wday
Enter highTem: 100
Enter lowTemp: 0
Enter precipitation: 23.3

Displaying:
highTemp: 100
lowTemp: 0
precipitation: 23.300000
Average: 50.000000

For the third element in the WeatherDay array
Displaying:
highTemp: 90
lowTemp: 20
precipitation: 45.800000
Average: 55.000000
```

Write a program that can manipulate BOOKS, and perform operations such as adding a new book, to check out books to people, and display the books available in the library.

1.
```
  GNU nano 2.9.3                    librarySystem.c

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

struct Book{
        char Title[100];
        char Author[100];
        int Pages;
        struct Book *next;
};

struct Book *start = NULL;

void addBook(void);
void checkOutBook(void);
void displayReport(void);
void searchBook(void);
```

2.
```
void addBook(){
        struct Book *new_book;
        new_book = malloc(sizeof(struct Book));
        if(new_book == NULL){
                printf("Can't add more books.\n");
                return;
        }
        printf("\nEnter the title of the book: ");
        scanf("%s",new_book->Title);

        printf("Enter the Author of the book: ");
        scanf("%s",new_book->Author);

        printf("Enter the number of pages of the book: ");
        scanf("%d",&new_book->Pages);

        new_book->next = start;
        start = new_book;

}
```

3.

```
void checkOutBook(){
        struct Book *cur, *prev;
        char title[100];
        if(start == NULL){
                printf("\nNo books are available.\n");
                return;
        }else{
                printf("\nEnter the title of the book: ");
                scanf("%s",title);
                for(cur = start, prev = NULL; cur != NULL ;prev = cur, cur = c$
                        if(strcmp(cur->Title,title)==0){

                                if(prev == NULL){
                                        start = start->next;
                                }else{
                                        prev->next = cur->next;
                                }
                                free(cur);
                                return;
                        }
                }
        printf("\nCould not find the  book.\n");
        }
```

4.

```
void displayReport(){
        struct Book *temp1;
        if(start == NULL){
                printf("\nThere is no book in the library.\n");
        }else{
                printf("\nTitle     Author     Page Number\n");
                for (temp1 = start; temp1 != NULL; temp1 = temp1->next){
                        printf("%7s     %s%11d\n",temp1->Title, temp1->Author,$
                }
        }
}
```

5.

```
void searchBook(){
        char title[100];
        struct Book *cur,*prev;
        printf("\nEnter the title of the book you want: ");
        scanf("%s",title);
        for(cur = start;cur!=NULL;cur = cur->next){
                if(strcmp(cur->Title,title)==0){
                printf("\nTitle: %s\n",cur->Title);
                printf("Author: %s\n",cur->Author);
                printf("Number of pages: %d\n",cur->Pages);
                return;
                }



        }
        printf("\nBook not found.\n");
}
```

6.

```
int main(){
        printf("What service would you like.\n");
        int choice;
        for(;;){
                printf("1. Add a book\n");
                printf("2. Check out a book\n");
                printf("3. Display report\n");
                printf("4. Search for a particular book\n");
                printf("5. Exit\n");
                printf("Enter your choice: ");
                scanf("%d",&choice);

                switch(choice){
                        case 1:
                                addBook();
                                break;
                        case 2:
                                checkOutBook();
                                break;
                        case 3:
                                displayReport();
                                break;
```

7.

```
                        case 4:
                                searchBook();
                                break;
                        case 5:
                                exit(EXIT_SUCCESS);
                        default:
                                printf("Invalid input! Enter a valid input\n");
                }
                printf("\n");

        }
        return 0;
}
```

Output:

1.
```
hanan@ubuntu:~/lab6$ ./ls
What service would you like.
1. Add a book
2. Check out a book
3. Display report
4. Search for a particular book
5. Exit
Enter your choice: 1

Enter the title of the book: verity
Enter the Author of the book: collen
Enter the number of pages of the book: 234

1. Add a book
2. Check out a book
3. Display report
4. Search for a particular book
5. Exit
Enter your choice: 1

Enter the title of the book: star
Enter the Author of the book: stephene
Enter the number of pages of the book: 122
```

2.
```
1. Add a book
2. Check out a book
3. Display report
4. Search for a particular book
5. Exit
Enter your choice: 3

Title     Author     Page Number
   star     stephene        122
 verity     collen        234

1. Add a book
2. Check out a book
3. Display report
4. Search for a particular book
5. Exit
Enter your choice: 2

Enter the title of the book: verity
```

3.

```
1. Add a book
2. Check out a book
3. Display report
4. Search for a particular book
5. Exit
Enter your choice: 3

Title     Author     Page Number
   star     stephene        122

1. Add a book
2. Check out a book
3. Display report
4. Search for a particular book
5. Exit
Enter your choice: 4

Enter the title of the book you want: star

Title: star
Author: stephene
Number of pages: 122
```

4.

```
1. Add a book
2. Check out a book
3. Display report
4. Search for a particular book
5. Exit
Enter your choice: 5
hanan@ubuntu:~/lab6$
```