Birla Institute of Technology & Science, Pilani
Computer Programming (CS F111)
Second Semester 2015-2016
Lab-11

Topics

Dynamic Memory Allocation and Structure

General Instructions:

- First create a directory with your full ID e.g. 2010A7PS111.
- Create a sub-directory (within the above directory) named Lab_No.
- Create all your files within the subdirectory.

Write a C program to maintain list of text book information for each class. The structure definition of text book and class/standard is as given below:

```
struct class
{
int no_books;
struct text_book *booklist;
};
typedef struct class std;
```

```
struct text_book
{
char name[10];
int bid;
float price;
int numaut;
char autlist[5][10];
};
```

Where, ***"no_books"*** refers the number of text books for the respective class and ***"booklist"*** stores the set of text books information of the respective class. The variable ***name, bid, price, numaut and autlist*** in the structure ***text_book*** refers name, identification number, price, number of author and list of authors of the text book respectively.

Write functions to perform the following:

1. void read_classInfobyRef(std *s,int cl_no,int nb)

This function takes a structure variable of type class by reference(***s***), class number(***cl_no***) and number of text books***(nb)*** for the class ***cl_no*** as arguments. This function reads the value of each variable in the structure class from the user.

Note1: Allocate memory dynamically for the variable ***booklist***.

Note2: To access member of the structure using pointer variable ***ptr***, either of following operators is used:

- ptr -> member
- (*ptr).member

2. void **print_classInfo**(std s,int cl_no)

This function takes a structure variable of type class by value(***s***) and class number(***cl_no)*** as arguments. This function prints the value of each variable in the structure class.

3. std read_classInfobyVal(std s,int cl_no,int nb)

This function takes a structure variable of type standard by value(***s***), class number(***cl_no)*** and number of text books***(nb)*** for the class ***cl_no*** as

arguments. This function reads the value of each variable in the structure standard from the user and returns the class s.

4. void **print_allInfo**(std *s, int nc)

This function takes array of structure of type class and number of classes in the school ***(nc)*** as arguments. This function prints the text book information of all classes in the school.

Template of Driver/Main function for calling the above mentioned functions is given below:

```
void main()
{
int nc,ns,i,j;
std *s;
printf("enter number of classes\n");
scanf("%d",&nc);
 // Allocate memory dynamically for the variable s using malloc()

for(i=1;i<=nc;i++)
{
 printf("enter number of text_books for %d standard\n",i);
 scanf("%d",&ns);
 // Call the function read_classInfobyRef() or read_classInfobyVal()

}
for(i=1;i<=nc;i++)
{
 // Call the function print_classInfo() appropriately

}
 // Call the function print_allInfo()
}
```

Exercises:

1. Modify the variable ***autlist[5][10]*** in the structure text_book into *****autlist*** and rewrite the function **read_classInfobyRef() and read_classInfobyVal**()by dynamically allocating memory for two dimensional array autlist[5][10].

2. Write a function to sort books ***in non-increasing order of*** book id "***bid"*.**