Programming Fundamentals (CS-1002)
Assignment 03
Deadline: May 05, 2023 (11:50 PM) (Submit on Google ClassRoom)

Points: 100 | Wtg: 03

Instructions:

1. Assignment submit only on GCR not via Email acceptable.
2. **ZIP all your codes in a folder with your Student ID like (21K-XXXX) where XXXX is your 4-digit student ID.**
3. Solve each problem in separate file, Name the code file with problem no (01.c, 02.c,…..)
4. Make sure your folder contains only .c file**. DON'T put the .EXE file in the .ZIP FOLDER**

Questions

1. Write a program to allocate memory dynamically for a dynamic array that resizes itself when needed. Implement insertion, deletion, and retrieval of elements in the array.
2. Write a program to allocate memory dynamically for a structure and initialize its members with values entered by the user.
3. Write a program to store a character string in a block of memory space created by malloc and then modify the same to store a larger string.
4. Write a program using pointers to determine the length of a character string.
5. Given an array of size n, the task is to sort this array using pointers in C
6. Write a program to declare a pointer variable and a 2D array. Initialize the pointer variable to point to the first element of the array. Print the elements of the array through the pointer.
7. Write a program to declare a pointer variable and a structure. Initialize the pointer variable to point to the structure. Access the members of the structure through the pointer.

---------- Table for Q8 and Q9 ----------

OrderDate	Region	Item	Units	Unit Cost	Total
1/6/21	East	Pencil	95	1.99	189.05
1/23/21	Central	Binder	50	19.99	999.50
2/9/21	Central	Pencil	36	4.99	179.64
2/26/21	Central	Pen	27	19.99	539.73
3/15/21	West	Pencil	56	2.99	167.44
4/1/21	East	Binder	60	4.99	299.40
4/18/21	Central	Pencil	75	1.99	149.25
5/5/21	Central	Pencil	90	4.99	449.10
5/22/21	West	Pencil	32	1.99	63.68
6/8/21	East	Binder	60	8.99	539.40
6/25/21	Central	Pencil	90	4.99	449.10
7/12/21	East	Binder	29	1.99	57.71
7/29/21	East	Binder	81	19.99	1,619.19
8/15/21	East	Pencil	35	4.99	174.65
9/1/21	Central	Desk	2	125.00	250.00
9/18/21	East	Pen Set	16	15.99	255.84
10/5/21	Central	Binder	28	8.99	251.72
10/22/21	East	Pen	64	8.99	575.36
11/8/21	East	Pen	15	19.99	299.85
11/25/21	Central	Pen Set	96	4.99	479.04

12/12/21	Central	Pencil	67	1.29	86.43
12/29/21	East	Pen Set	74	15.99	1,183.26
1/15/22	Central	Binder	46	8.99	413.54
2/1/22	Central	Binder	87	15.00	1,305.00
2/18/22	East	Binder	4	4.99	19.96
3/7/22	West	Binder	7	19.99	139.93
3/24/22	Central	Pen Set	50	4.99	249.50
4/10/22	Central	Pencil	66	1.99	131.34
4/27/22	East	Pen	96	4.99	479.04
5/14/22	Central	Pencil	53	1.29	68.37
5/31/22	Central	Binder	80	8.99	719.20
6/17/22	Central	Desk	5	125.00	625.00
7/4/22	East	Pen Set	62	4.99	309.38
7/21/22	Central	Pen Set	55	12.49	686.95
8/7/22	Central	Pen Set	42	23.95	1,005.90
8/24/22	West	Desk	3	275.00	825.00
9/10/22	Central	Pencil	7	1.29	9.03
9/27/22	West	Pen	76	1.99	151.24
10/14/22	West	Binder	57	19.99	1,139.43
10/31/22	Central	Pencil	14	1.29	18.06
11/17/22	Central	Binder	11	4.99	54.89
12/4/22	Central	Binder	94	19.99	1,879.06
12/21/22	Central	Binder	28	4.99	139.72

Q8. Assume that the above is the structure perform the following task on the above table using structure and functions.

1. Take **OrderDate** input from user and show all the sales on given date.

OrderDate	Region	Item	Units	Unit Cost	Total
2/9/21	Central	Pencil	36	4.99	179.64
2/26/21	Central	Pen	27	19.99	539.73

2. Take **Item** input from user and show all the sales on given item.

OrderDate	Region	Item	Units	Unit Cost	Total
9/1/21	Central	Desk	2	125.00	250.00
6/17/22	Central	Desk	5	125.00	625.00
8/24/22	West	Desk	3	275.00	825.00

3. Take **Region** input from user and show all the sales on given Region.

OrderDate	Region	Item	Units	Unit Cost	Total
3/15/21	West	Pencil	56	2.99	167.44
5/22/21	West	Pencil	32	1.99	63.68
3/7/22	West	Binder	7	19.99	139.93
8/24/22	West	Desk	3	275.00	825.00
9/27/22	West	Pen	76	1.99	151.24
10/14/22	West	Binder	57	19.99	1,139.43

Q9. Assume that the above is the structure perform the following task on the above table using structure and functions.

1. Show total sales summary of **item** on given item.

Row Labels	Sum of Total
Binder	9577.65
Desk	1700
Pen	2045.22
Pen Set	4169.87
Pencil	2135.14
Grand Total	**19627.88**

2. Show total sales summary of **Region** on given item

Row Labels	Sum of Total
Central	11139.07
East	6002.09
West	2486.72
Grand Total	**19627.88**

Q10. Assume that the below are two structures.

Structure 1 − CUSTOMERS Table

ID	NAME	AGE	ADDRESS	SALARY
1	Ramesh	32	Ahmedabad	2000.00
2	Khilan	25	Delhi	1500.00
3	kaushik	23	Kota	2000.00
4	Chaitali	25	Mumbai	6500.00
5	Hardik	27	Bhopal	8500.00
6	Komal	22	MP	4500.00
7	Muffy	24	Indore	10000.00

Structure 2 − ORDERS Table

OID	DATE	CUSTOMER_ID	AMOUNT
102	2009-10-08 00:00:00	3	3000
100	2009-10-08 00:00:00	3	1500
101	2009-11-20 00:00:00	2	1560
103	2008-05-20 00:00:00	4	2060

Take NAME input from user Find the record and combine both structure e.g. Name = kaushik

ID	NAME	AGE	AMOUNT
3	kaushik	23	3000
3	kaushik	23	1500