Jaypee University of Engineering and Technology, Guna

Department of Computer Science and Engineering

Object Oriented Programming Lab (18B17CI271)

Lab Exercise-2

(Revisiting C Programming)

Name:-Palash Mishra

Enroll no. :- 201B172

Question 1.

1. Write a function that will return the length of a character string using pointer. You are not allowed to use the strlen C library function.

```c
#include <stdio.h>
int len(char *len)
{
    int i;
    for ( i = 0; len[i] != '\0'; i++);

    return i;

}
int main()
{
    char str[100];
    printf("Enter your string \n");
    gets(str);
    printf("The Lenght of the string : %d\n",len(str));

    return 0;
}
```

Output:

Question 2.

```c
#include <stdio.h>
void minmax(int arr[], int length, int *min, int *max)
{
    int temp;
    for (int i = 0; i < length; i++)
    {
        for (int j = 0; j < length - 1; j++)
        {
            if (arr[j] < arr[j + 1])
            {
                temp = arr[j];
                arr[j] = arr[j + 1];
                arr[j + 1] = temp;
            }
        }
    }
    *min = arr[length-1];
    *max = arr[0];
}
int main()
{
    int len, max, min;
    printf("Enter the length : \n");
    scanf("%d", &len);
    int arr[len];
    for (int i = 0; i < len; i++)
    {
        scanf("%d", &arr[i]);
    }
    int *ptr = arr;
    minmax(ptr, len, &min, &max);
    printf("The Maximum Value is : %d \nThe Minimum Value is : %d",max,min);
    return 0;
}
```

Output:

```
PROBLEMS 1  OUTPUT  DEBUG CONSOLE  TERMINAL
Windows PowerShell
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Try the new cross-platform PowerShell https://aka.ms/pscore6

PS D:\college stuff\sem2\OOP\lab2> cd "d:\college stuff\sem2\OOP\lab2\" ; if ($?) { gcc que2.c -o que2 } ; if ($?) { .\que2 }
Enter the length :
10
1
2
4
8
9
6
5
7
3
5
The Maximum Value is : 9
The Minimum Value is : 1
PS D:\college stuff\sem2\OOP\lab2>
```
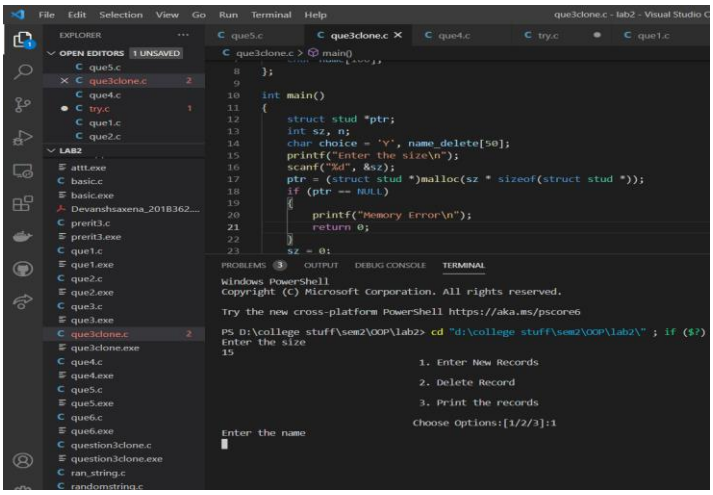

Question 3.

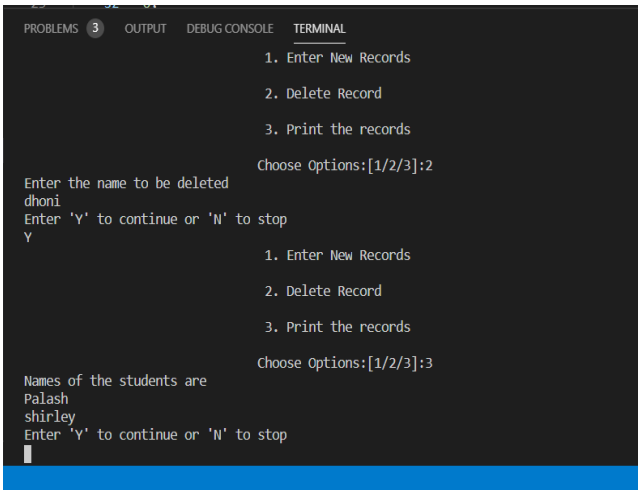
```c
#include <stdio.h>
#include <stdlib.h>
#include <conio.h>
#include <string.h>
struct stud
{
    char name[100];
};

int main()
{
    struct stud *ptr;
    int sz, n;
    char choice = 'Y', name_delete[50];
    printf("Enter the size\n");
    scanf("%d", &sz);
    ptr = (struct stud *)malloc(sz * sizeof(struct stud *));
    if (ptr == NULL)
    {
        printf("Memory Error\n");
        return 0;
    }
    sz = 0;
    while (choice != 'N')
    {
        printf("\t\t\t\t");
        printf(" 1. Enter New Records\n\n");
```

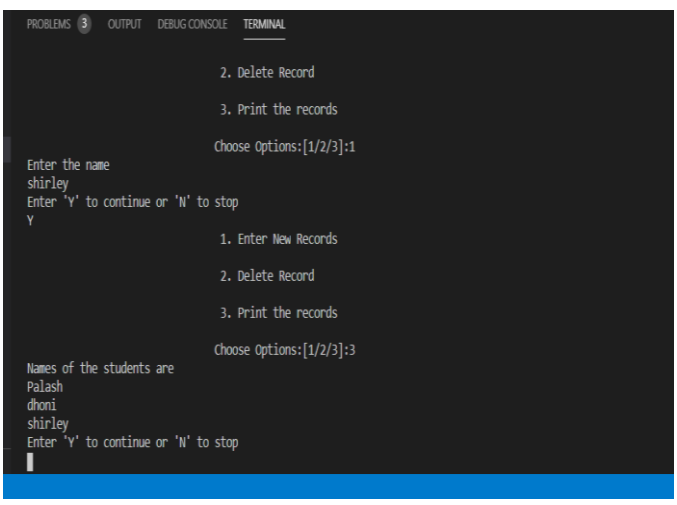
```
        printf("\t\t\t\t");
        printf(" 2. Delete Record\n\n");
        printf("\t\t\t\t");
        printf(" 3. Print the records\n\n");
        printf("\t\t\t\t");
        printf("Choose Options:[1/2/3]:");
        scanf("%d", &n);
        switch (n)
        {
        case 1:
        {
            printf("Enter the name\n");
            fflush(stdin);
            gets((ptr + sz)->name);
            sz++;
            break;
        }
        case 2:
        {
            printf("Enter the name to be deleted\n");
            fflush(stdin);
            gets(name_delete);
            int k = -1;
            for (int i = 0; i < sz; i++)
            {
                if (strcmp(name_delete, (ptr + i)->name) == 0)
                {
                    k = i;
                    break;
                }
            }
            if (k == -1)
            {
                printf("ERROR\n");
            }
            else
            {
                for (int j = k; j < sz - 1; j++)
                {
                    strcpy((ptr + j)->name, (ptr + j + 1)->name);
                }
                sz--;
                ptr = (struct stud *)realloc(ptr, sz * sizeof(struct stud *));
            }
            break;
        }
        case 3:
        {
            printf("Names of the students are\n");
            if (sz == 0)
                printf("ERROR\n");
            else
            {
                for (int i = 0; i < sz; i++)
```

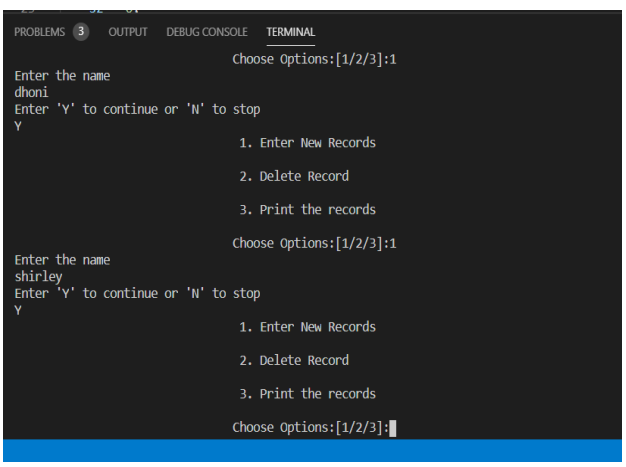
```
                    printf("%s\n", (ptr + i)->name);
                }
                break;
            }
            default:
                printf("ERROR-Invalid Input");
                return 0;
            }
            printf("Enter 'Y' to continue or 'N' to stop\n");
            fflush(stdin);
            scanf("%c", &choice);
        }
        free(ptr);
        ptr = NULL;
        return 0;
}
```

Output:









Question 4.

```c
#include <stdio.h>
#include <stdlib.h>
#include <time.h>

void printRandoms(int up , int down ,
                  int nums )
{
    int i;
    for (i = 0; i < nums; i++)
    {
        int num = (rand() %
                   (up - down + 1)) +
                  down;
        printf("%d ", num);
    }
}

int main()
{
    int m,n,num_s;

printf("Enter the upper bound : \n");
scanf("%d",&m);
printf("Enter the lower bound : \n");
scanf("%d",&n);
printf("Enter value that how many random numbers you want : \n");
scanf("%d",&num_s);
    srand(time(0));

    printRandoms(m,n,num_s);

    return 0;
}
```

Output:

```
PROBLEMS 1   OUTPUT   DEBUG CONSOLE   TERMINAL

Windows PowerShell
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Try the new cross-platform PowerShell https://aka.ms/pscore6

PS D:\college stuff\sem2\OOP\lab2> cd "d:\college stuff\sem2\OOP\lab2\" ; if ($?) { gcc que4.c -o que4 } ; if ($?) { .\que4 }
Enter the upper bound :
50
Enter the lower bound :
10
Enter value that how many random numbers you want :
1
39
PS D:\college stuff\sem2\OOP\lab2>
```
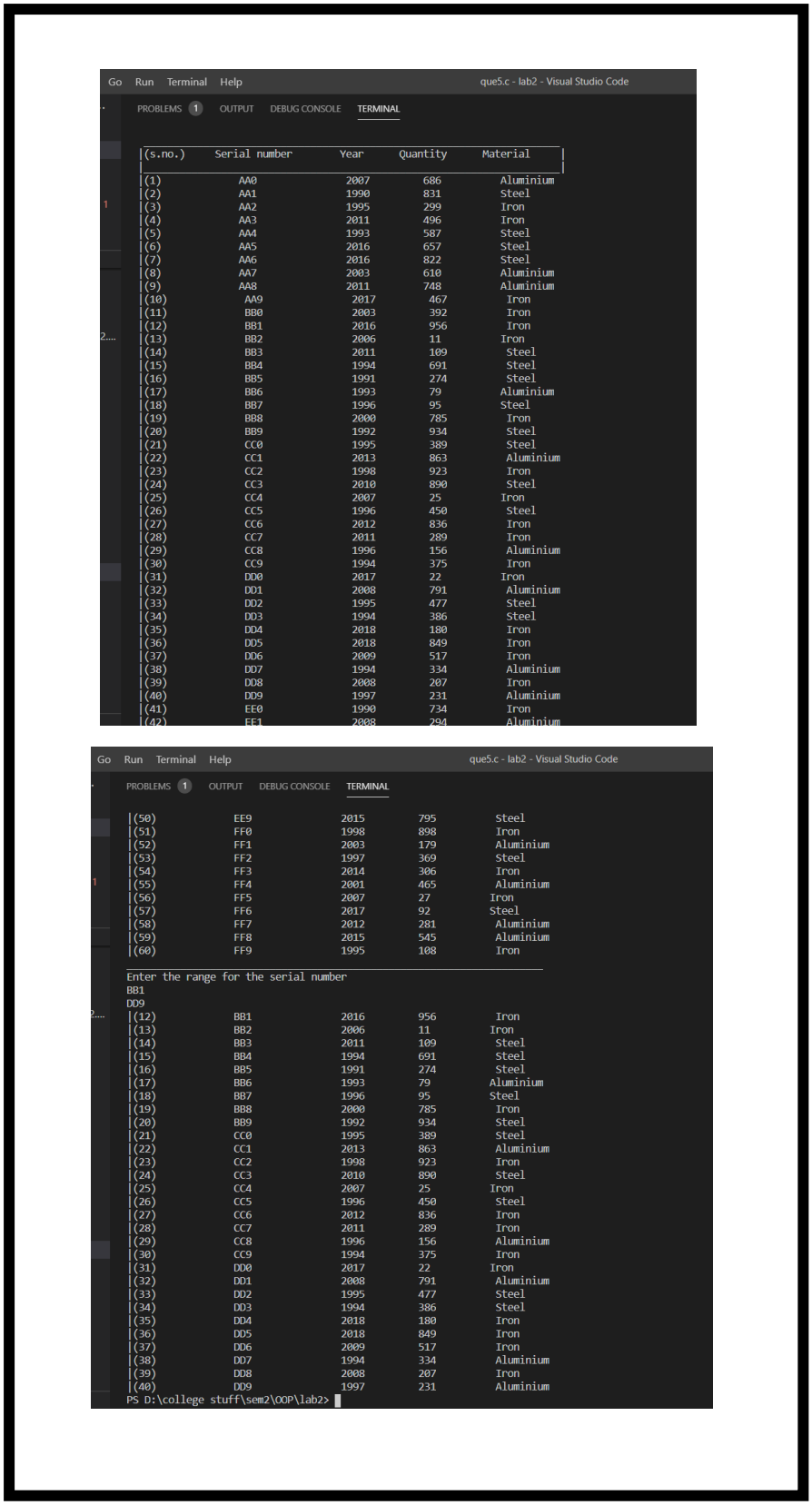

Question 5.

```c
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include <time.h>
char *random_ser();
char str[60][3];
char ch = 'A', ch2 = '0';
int n = 0, k;
typedef struct company
{  char ser_num[4];
    int year;
    char material[20];
    int qty;
} com;
int main()
{   int q;
    srand(time(0));
    int num;
    com arr[60];
    for (int i = 0; i < 60; i++)
    {
        q = rand() % 3;
        strcpy(arr[i].ser_num, random_ser());
        arr[i].year = (rand() % (2018 - 1990 + 1)) + 1990;
        if (q == 0)
            strcpy(arr[i].material, "Steel    ");
        else if (q == 1)
            strcpy(arr[i].material, "Aluminium");
        else
            strcpy(arr[i].material, "Iron     ");
        arr[i].qty = (rand() % (1000 - 1 + 1)) + 1;
    }
    printf(" _____________________________________________________________________\n");
    printf("|(s.no.)     Serial number        Year      Quantity      Material     |\n");
    printf("|_____________________________________________________________________|\n");
    for (int j = 0; j < 60; j++)
    {
        printf("|(%d)             %s               %d         %d          %s     \n", j +
1, arr[j].ser_num, arr[j].year, arr[j].qty, arr[j].material);
    }
    printf("_____________________________________________________________________\n");
    char ser1[3], ser2[3];
    printf("Enter the range for the serial number\n");
    gets(ser1);
    gets(ser2);
    int s, e;
    for (k = 0; 1; k++)
    {
    if (arr[k].ser_num[1] == ser1[1] && arr[k].ser_num[2] == ser1[2])
        {
```

```
            s = k;
        }
    if (arr[k].ser_num[1] == ser2[1] && arr[k].ser_num[2] == ser2[2])
        {
            e = k;
            break;
        }
    }
    for (int z = s; z <= e; z++)
    {
        printf("|(%d)             %s               %d         %d          %s     \n", z +
1, arr[z].ser_num, arr[z].year, arr[z].qty, arr[z].material);
    }
 return 0;
}
char *random_ser()
{
    char *ptr;
    int i, j;
    for (j = 0; j < 3; j++)
    {
        str[i][j] = ch2;
        if (j < 2)
        {
            str[i][j] = ch;
        }
    }
    ch2++;
    n++;
    while (n > 9)
    {
        n -= 10;
        ch++;
        ch2 = '0';
    }
    ptr = str;
    return ptr;
}
```

Output:



Go Run Terminal Help — que5.c - lab2 - Visual Studio Code

PROBLEMS 1 OUTPUT DEBUG CONSOLE TERMINAL

(s.no.)	Serial number	Year	Quantity	Material
(1)	AA0	2007	686	Aluminium
(2)	AA1	1990	831	Steel
(3)	AA2	1995	299	Iron
(4)	AA3	2011	496	Iron
(5)	AA4	1993	587	Steel
(6)	AA5	2016	657	Steel
(7)	AA6	2016	822	Steel
(8)	AA7	2003	610	Aluminium
(9)	AA8	2011	748	Aluminium
(10)	AA9	2017	467	Iron
(11)	BB0	2003	392	Iron
(12)	BB1	2016	956	Iron
(13)	BB2	2006	11	Iron
(14)	BB3	2011	109	Steel
(15)	BB4	1994	691	Steel
(16)	BB5	1991	274	Steel
(17)	BB6	1993	79	Aluminium
(18)	BB7	1996	95	Steel
(19)	BB8	2000	785	Iron
(20)	BB9	1992	934	Steel
(21)	CC0	1995	389	Steel
(22)	CC1	2013	863	Aluminium
(23)	CC2	1998	923	Iron
(24)	CC3	2010	890	Steel
(25)	CC4	2007	25	Iron
(26)	CC5	1996	450	Steel
(27)	CC6	2012	836	Iron
(28)	CC7	2011	289	Iron
(29)	CC8	1996	156	Aluminium
(30)	CC9	1994	375	Iron
(31)	DD0	2017	22	Iron
(32)	DD1	2008	791	Aluminium
(33)	DD2	1995	477	Steel
(34)	DD3	1994	386	Steel
(35)	DD4	2018	180	Iron
(36)	DD5	2018	849	Iron
(37)	DD6	2009	517	Iron
(38)	DD7	1994	334	Aluminium
(39)	DD8	2008	207	Iron
(40)	DD9	1997	231	Aluminium
(41)	EE0	1990	734	Iron
(42)	EE1	2008	294	Aluminium

Go Run Terminal Help — que5.c - lab2 - Visual Studio Code

PROBLEMS 1 OUTPUT DEBUG CONSOLE TERMINAL

(50)	EE9	2015	795	Steel
(51)	FF0	1998	898	Iron
(52)	FF1	2003	179	Aluminium
(53)	FF2	1997	369	Steel
(54)	FF3	2014	306	Iron
(55)	FF4	2001	465	Aluminium
(56)	FF5	2007	27	Iron
(57)	FF6	2017	92	Steel
(58)	FF7	2012	281	Aluminium
(59)	FF8	2015	545	Aluminium
(60)	FF9	1995	108	Iron

```
Enter the range for the serial number
BB1
DD9
```

(12)	BB1	2016	956	Iron
(13)	BB2	2006	11	Iron
(14)	BB3	2011	109	Steel
(15)	BB4	1994	691	Steel
(16)	BB5	1991	274	Steel
(17)	BB6	1993	79	Aluminium
(18)	BB7	1996	95	Steel
(19)	BB8	2000	785	Iron
(20)	BB9	1992	934	Steel
(21)	CC0	1995	389	Steel
(22)	CC1	2013	863	Aluminium
(23)	CC2	1998	923	Iron
(24)	CC3	2010	890	Steel
(25)	CC4	2007	25	Iron
(26)	CC5	1996	450	Steel
(27)	CC6	2012	836	Iron
(28)	CC7	2011	289	Iron
(29)	CC8	1996	156	Aluminium
(30)	CC9	1994	375	Iron
(31)	DD0	2017	22	Iron
(32)	DD1	2008	791	Aluminium
(33)	DD2	1995	477	Steel
(34)	DD3	1994	386	Steel
(35)	DD4	2018	180	Iron
(36)	DD5	2018	849	Iron
(37)	DD6	2009	517	Iron
(38)	DD7	1994	334	Aluminium
(39)	DD8	2008	207	Iron
(40)	DD9	1997	231	Aluminium

```
PS D:\college stuff\sem2\OOP\lab2>
```

Question 6.

```c
#include <stdio.h>

int main()
{
    int N, t_case, sum = 0;
    printf("Enter the number of test cases : \n");
    scanf("%d", &t_case);

    for (int i = 1; i <= t_case; i++)
    {
        printf("Enter the size \n");
        scanf("%d", &N);
        int arr[N];

        for (int j = 0; j < N; j++)
        {
            scanf("%d", &arr[j]);
        }
        sum = ((N + 1) * (N + 2)) / 2;
        for (int k = 0; k < N; k++)
        {
            printf("%d ", arr[k]);
            sum = sum - arr[k];
        }
        printf("Missing element is : %d", sum);
        printf("\n");
    }

    return 0;
}
```

Output:

```
PS D:\college stuff\sem2\OOP\lab2> cd "d:\college stuff\sem2\OOP\lab2\" ; if ($?) { gcc que6.c -o que6 } ; if ($?) { .\que6 }
Enter the number of test cases :
2
Enter the size
4
1
2
3
5
1 2 3 5 Missing element is : 4
Enter the size
9
1
2
3
4
5
6
7
8
10
1 2 3 4 5 6 7 8 10 Missing element is : 9
PS D:\college stuff\sem2\OOP\lab2>
```