SSN COLLEGE OF ENGINEERING (Autonomous)
(Affiliated to Anna University, Chennai)
DEPARTMENT OF CSE
UCS 1211 PROGRAMMING IN C LABORATORY
A3: Array handling in C

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1.Program Name: To find well ordered numbers

Program:

```
#include<stdio.h>
int ord(int num)
{
int r,temp=num;
do
{
 r=num%10;
 num/=10;
 if(r<=num%10)
  return 0;
}while(num!=0);
return temp;
}

void main()
{
int a[200],c=0,x;
for(int i=100;i<=999;++i)
{
 x=ord(i);
```

```
 if(x!=0)
  {a[c]=x;
   c++;
  }
}
for(int j=0;j<c;++j)
 printf("%d\n",a[j]);
printf("The total number of well ordered numbers are: %d",c);
}
```

Output:

```
csea50@jtl-13:~/assignment3$ ./order
123
124
125
126
127
128
129
134
135
136
137
138
139
145
146
147
148
149
156
157
158
```

159
167
168
169
178
179
189
234
235
236
237
238
239
245
246
247
248
249
256
257
258
259
267
268
269
278
279
289
345
346
347
348
349
356

357
358
359
367
368
369
378
379
389
456
457
458
459
467
468
469
478
479
489
567
568
569
578
579
589
678
679
689
789
The total number of well ordered numbers are: 84

2. Program Name: Vertical histogram of numbers

Program:

```
#include<stdio.h>
void main()
{
int a[10]={0},n,k,i,j,max;

printf("enter the no of digits:");
scanf("%d",&n);
for(i=0;i<n;i++)
        {
        printf("enter the digits:");
        scanf("%d",&k);
        a[k]+=1;
        }
max=a[0];
for(i=1;i<10;i++)
        if(a[i]>max)
                max=a[i];
printf("\n");
for(i=max;i>=1;i--)
        {
        for(j=0;j<10;j++)
                if(a[j]>=i)
                        printf("*  ");
                else
                        printf("   ");
        printf("\n");
        }
for(i=0;i<=9;i++)
        printf("%d  ",i);
printf("\n");
}
```

Output:

```
csea50@jtl-13:~/assignment3$ ./histo
enter the no of digits:12
enter the digits:0
enter the digits:3
enter the digits:1
enter the digits:8
enter the digits:5
enter the digits:0
enter the digits:0
enter the digits:1
enter the digits:0
enter the digits:8
enter the digits:4
enter the digits:6

*
*
*  *                 *
*  *     * *  * *     *
0  1  2  3  4  5  6  7  8  9
```

3. Program Name: Push zeroes to end of an array

Program:

```
#include<stdio.h>
void pushzeroestoend(int arr[],int n);
void main()
{
int n,i,a[10]={0};
printf("Enter the no of elements:");
scanf("%d",&n);
```

```
for(i=0;i<n;i++)
        {
        printf("Enter the element:");
        scanf("%d",&a[i]);
        }
pushzeroestoend(a,n);
printf("\n The altered array is :");
for(i=0;i<n;i++)
        {
        printf("%d",a[i]);
        if(i!=n-1)
                printf(",");
        }
printf("\n");
}
void pushzeroestoend(int a[],int n)
{
int i,j;
for(i=0;i<n;i++)
        {
        if(a[i]==0)
        {     i=i-1;
                for(j=i+1;j<n-1;j++)
                        a[j]=a[j+1];

                a[n-1]=0;
                n--;
        }
        }
}
```

Output:

```
csea50@jtl-13:~/assignment3$ ./push
```

Enter the no of elements:6
Enter the element:0
Enter the element:3
Enter the element:2
Enter the element:0
Enter the element:0
Enter the element:1

The altered array is :3,2,1,0,0,0

4. Program Name: To display marklist of students

Program:

```
#include<stdio.h>
float average(float mark[10][10],int n, int c)
{
float sum,classavg;
for(int i=0;i<n;i++)
        {
        sum=0;
        for(int j=0;j<c;j++)
                sum+=mark[i][j];

        mark[i][c]=sum/c;
        }
sum=0;
for(int i=0;i<n;i++)
        sum+=mark[i][c];

return sum/n;
}
```

```
void main()
{
char name[10][80];
float mark[10][10],clsavg;                                  ;
int c,n,i,j;
printf("\nEnter the no of students:");
scanf("%d",&n);
printf("\nEnter the no of courses:");
scanf("%d",&c);
for(i=0;i<n;i++)
        {
        printf("enter your name:");
        scanf("%s",name[i]);
        for(j=0;j<c;j++)
                {
                printf("Enter mark %d:",j+1);
                scanf("%f",&mark[i][j]);
                }
        }
clsavg=average(mark,n,c);
printf("\n\nthe class average is %.2f \n",clsavg);
printf("\n\nmarklist::\n\n");

for(i=0;i<n;i++)
        {
        printf("\nNAME:");
        puts(name[i]);
        for(j=0;j<c;j++)
                printf("MARK %d:%.2f   ",j+1,mark[i][j]);
        printf("  AVG:%.2f",mark[i][c]);
        }
printf("\n");
}
```

Output:

```
csea50@jtl-13:~/assignment3$ ./exam
Enter the no of students:3

Enter the no of courses:3
enter your name:Abc
Enter mark 1:89
Enter mark 2:75
Enter mark 3:85
enter your name:Pqr
Enter mark 1:82
Enter mark 2:90
Enter mark 3:70
enter your name:Xyz
Enter mark 1:78
Enter mark 2:65
Enter mark 3:88


the class average is 80.22

marklist::

NAME:Abc
MARK 1:89.00   MARK 2:75.00   MARK 3:85.00    AVG:83.00
NAME:Pqr
MARK 1:82.00   MARK 2:90.00   MARK 3:70.00    AVG:80.67
NAME:Xyz
MARK 1:78.00   MARK 2:65.00   MARK 3:88.00    AVG:77.00
```

4.a. Program Name: To get the weightage of each subject and determine the marklist

Program:

```
#include<stdio.h>
float average(float mark[10][10],float weight[10],int n, int c)
{
float sum;
for(int i=0;i<n;i++)
        {
        sum=0;
        for(int j=0;j<c;j++)
                sum+=(weight[j]*(mark[i][j]/100));

        mark[i][c]=sum;
        }
sum=0;
for(int i=0;i<n;i++)
        sum+=mark[i][c];

return sum/n;
}




void main()
{
char name[10][80];
float mark[10][10],weight[10];
int c,n,i,j;
printf("\nEnter the no of students:");
scanf("%d",&n);
printf("\nEnter the no of courses:");
scanf("%d",&c);
for(j=0;j<c;j++)
```

```
{
printf("Enter mark%d weightage:",j+1);
scanf("%f",&weight[j]);
}
for(i=0;i<n;i++)
        {
        printf("enter your name:");
        scanf("%s",name[i]);
        for(j=0;j<c;j++)
                {
                printf("Enter mark%d:",j+1);
                scanf("%f",&mark[i][j]);
                }
        }

printf("\n\nthe class average is %.2f \n",average(mark,weight,n,c));
printf("\n\nmarklist::\n\n");

for(i=0;i<n;i++)
        {
        printf("\n name:");
        puts(name[i]);
        for(j=0;j<c;j++)
                printf("mark%d:%.2f   ",j+1,mark[i][j]);
        printf("  average:%.2f",mark[i][c]);
        }
printf("\n");
}
```

Output:

```
csea50@jtl-13:~/assignment3$ ./exam4a
Enter the no of students:3
```

Enter the no of courses:3
Enter mark1 weightage:50
Enter mark2 weightage:25
Enter mark3 weightage:25
enter your name:Abc
Enter mark1:85
Enter mark2:80
Enter mark3:75
enter your name:Pqr
Enter mark1:90
Enter mark2:88
Enter mark3:85
enter your name:Xyz
Enter mark1:75
Enter mark2:80
Enter mark3:86

the class average is 82.83

marklist::

name:Abc
mark1:85.00 mark2:80.00 mark3:75.00 average:81.25
name:Pqr
mark1:90.00 mark2:88.00 mark3:85.00 average:88.25
name:Xyz
mark1:75.00 mark2:80.00 mark3:86.00 average:79.00

4.b. Program Name: To determine the marklist along with deviation of each students' marks

Program:

```
#include<stdio.h>
float average(float mark[10][10],float weight[10],int n, int c)
{
float sum,classavg;
for(int i=0;i<n;i++)
        {
        sum=0;
        for(int j=0;j<c;j++)
                sum+=(weight[j]*(mark[i][j]/100));

        mark[i][c]=sum;
        }
sum=0;
for(int i=0;i<n;i++)
        sum+=mark[i][c];

classavg=sum/n;
for(int i=0;i<n;i++)
        mark[i][c+1]=mark[i][c]-classavg;
return classavg;
}


void main()
{
char name[10][80];
float mark[10][10],weight[10];
int c,n,i,j;
printf("\nEnter the no of students:");
scanf("%d",&n);
printf("\nEnter the no of courses:");
scanf("%d",&c);
```

```
for(j=0;j<c;j++)
{
printf("Enter mark%d weightage:",j+1);
scanf("%f",&weight[j]);
}
for(i=0;i<n;i++)
        {
        printf("enter your name:");
        scanf("%s",name[i]);
        for(j=0;j<c;j++)
                {
                printf("Enter mark%d:",j+1);
                scanf("%f",&mark[i][j]);
                }
        }


printf("\n\nthe class average is %.2f \n",average(mark,weight,n,c));
printf("\n\nmarklist::\n\n");

for(i=0;i<n;i++)
        {
        printf("\n name:");
        puts(name[i]);
        for(j=0;j<c;j++)
                printf("mark%d:%.2f   ",j+1,mark[i][j]);
        printf("  average:%.2f  deviation:%.2f",mark[i][c],mark[i][c+1]);

        }
printf("\n");
}
```

Output:

```
csea50@jtl-13:~/assignment3$ ./exam4b
Enter the no of students:3

Enter the no of courses:3
Enter mark1 weightage:50
Enter mark2 weightage:25
Enter mark3 weightage:25
enter your name:Abc
Enter mark1:84
Enter mark2:92
Enter mark3:76
enter your name:Pqr
Enter mark1:96
Enter mark2:78
Enter mark3:89
enter your name:Xyz
Enter mark1:75
Enter mark2:70
Enter mark3:95


the class average is 84.17


marklist::


 name:Abc
mark1:84.00   mark2:92.00   mark3:76.00    average:84.00  deviation:-0.17
 name:Pqr
mark1:96.00   mark2:78.00   mark3:89.00    average:89.75  deviation:5.58
 name:Xyz
mark1:75.00   mark2:70.00   mark3:95.00    average:78.75  deviation:-5.42
```

6. Program Name: Rock-paper-scissors Game

Program:

```
#include<stdio.h>
#include<stdlib.h>
void main()
{
char ch1,ch2,op[3]={'R','P','S'};
int i=0,point[2]={0,0},r;
printf("'\n\nR-Rock  P-Paper  S-Scissors");
for(;i<10;++i)
        {
        ch1=ch2='\0';
        printf("\n**************************\n\nEnter(R/P/S): ");
        scanf(" %c",&ch1);
        r=rand()%3;
        ch2=op[r];
        printf("Your Choice: %c \nComputer's Choice: %c",ch1,ch2);

        if (ch1=='R' && ch2=='S')
                {
                printf("\nYOU WIN");
                point[0]+=1;
                }
        else if (ch1=='S' && ch2=='P')
                {
                printf("\nYOU WIN");
                point[0]+=1;
                }
        else if (ch1=='P' && ch2=='R')
                {
                printf("\nYOU WIN");
                point[0]+=1;
```

```
                }
        else if (ch1==ch2)
                printf("\nDRAW");
        else
                {
                printf("\nCOMPUTER WINS");
                point[1]+=1;
                }
        }
printf("\nSCOREBOARD\n~~~~~~~~~~");
printf("\nYOU: %d",point[0]);
printf("\nCOMPUTER: %d",point[1]);

if(point[0]>point[1])
        printf("\nYOU WON THE SERIES!!!");
else if(point[0]<point[1])
        printf("\nCOMPUTER WON THE SERIES!!!");
else
        printf("\nIT'S A DRAW");
}
```

Output:

```
csea50@jtl-13:~/assignment3$ ./rps
R-Rock  P-Paper  S-Scissors
**************************

Enter(R/P/S): R
Your Choice: R
Computer's Choice: S
YOU WIN
**************************
```

Enter(R/P/S): S
Your Choice: S
Computer's Choice: S
DRAW
****

Enter(R/P/S): S
Your Choice: S
Computer's Choice: P
YOU WIN
****

Enter(R/P/S): S
Your Choice: S
Computer's Choice: P
YOU WIN
****

Enter(R/P/S): R
Your Choice: R
Computer's Choice: S
YOU WIN
****

Enter(R/P/S): P
Your Choice: P
Computer's Choice: P
DRAW
****

Enter(R/P/S): R
Your Choice: R
Computer's Choice: R
DRAW

****

Enter(R/P/S): S
Your Choice: S
Computer's Choice: R
COMPUTER WINS
****

Enter(R/P/S): R
Your Choice: R
Computer's Choice: P
COMPUTER WINS
****

Enter(R/P/S): P
Your Choice: P
Computer's Choice: S
COMPUTER WINS

SCOREBOARD
~~~~~~~~~~
YOU: 4
COMPUTER: 3
YOU WON THE SERIES!!!
~~~~~~~~~~