NATIONAL INSTITUTE OF TECHNOLOGY KURUKSHETRA

Programming Methodology(Pr.)

Lab Programs

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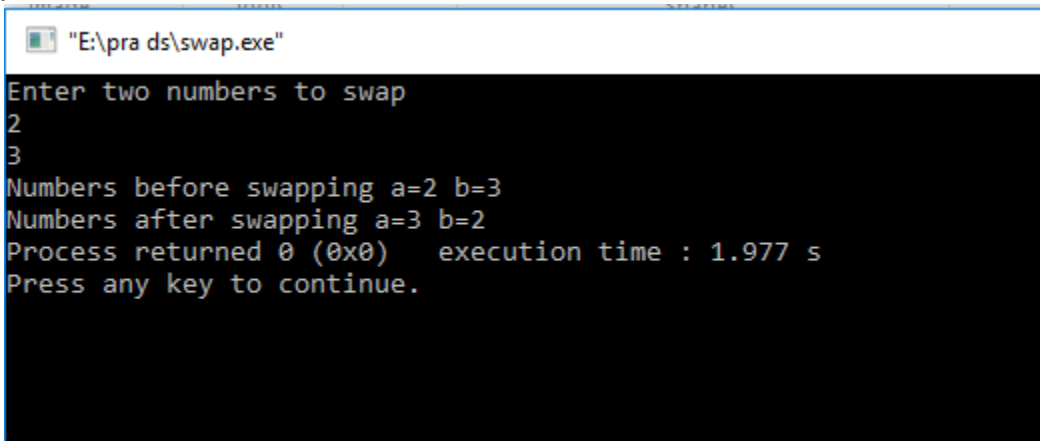
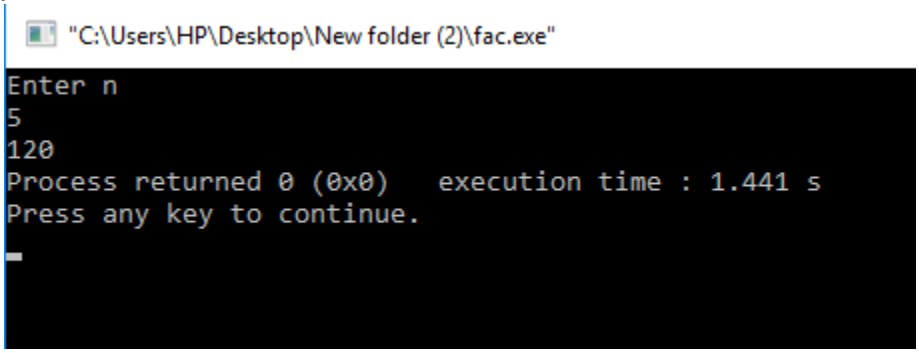
```
/*Swap to Two Numbers*/
#include<stdio.h>
```

```
void swap(int * ,int * );
int main()
{
int a,b;
printf("Enter two numbers to swap\n");
scanf("%d%d",&a,&b);
printf("Numbers before swapping a=%d b=%d\n",a,b);
a=a^b;
b=a^b;
a=a^b;
printf("Numbers after swapping a=%d b=%d",a,b);
return 0;
}
```

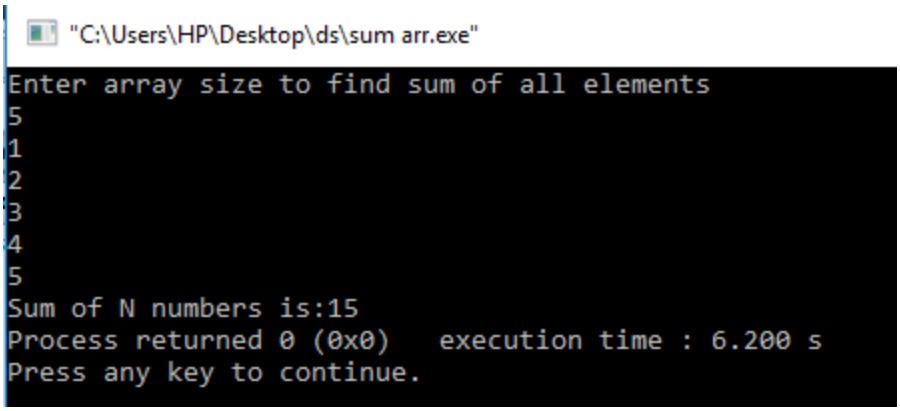



```
/*Program to calculate Factorial*/
#include<stdio.h>
```

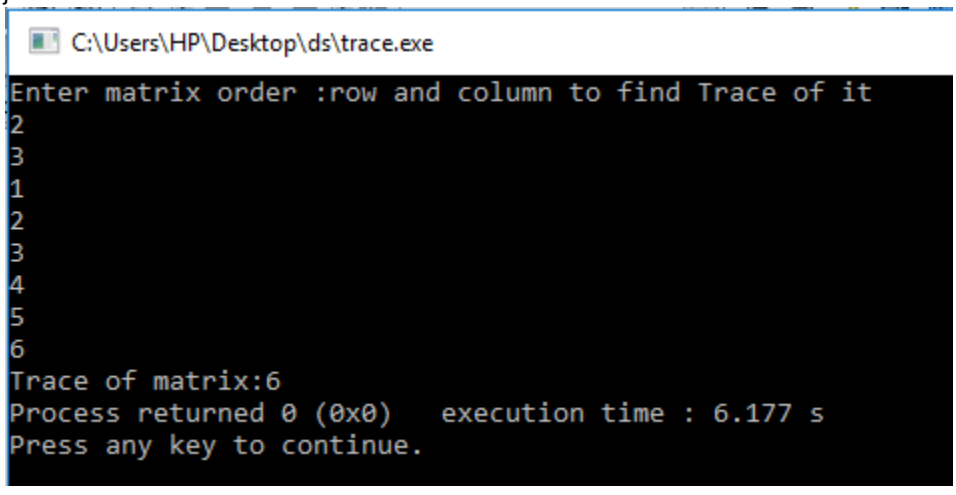
```
int main()
{int n;
printf("Enter n\n");
scanf("%d",&n);
printf("%d",fac(n));
return 0;
}
int fac(int a)
{static int b=1;
if(a==0)
return 1;
else
b=b*a;
if(a==2)
return b;
fac(a-1);

}
```



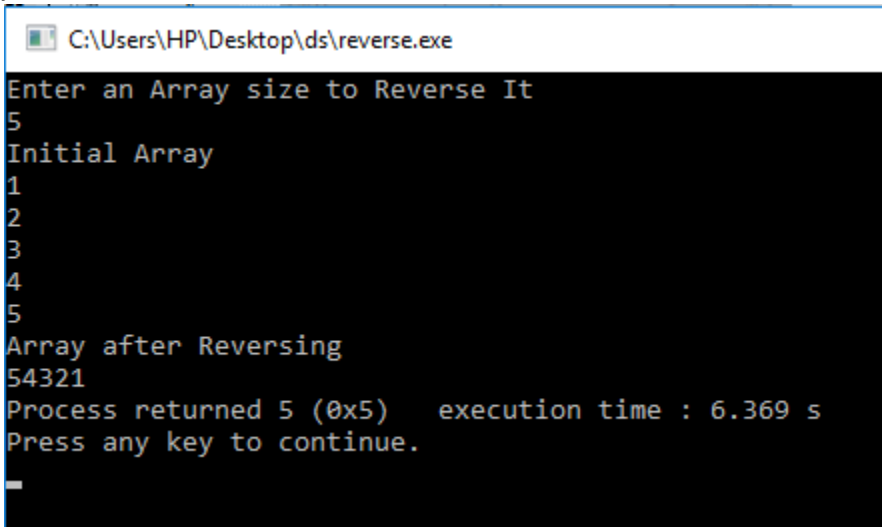

```
/*Here sum of n elements of array is find in O(1)space complexity*/
#include<stdio.h>
int main()
{printf("Enter array size to find sum of all elements\n");
int sz;
scanf("%d",&sz);
int a,b,sum=0;
for(a=0;a<sz;a++)
{
scanf("%d",&b);
sum+=b;
}
printf("Sum of N numbers is:%d",sum);
return 0;
}
```



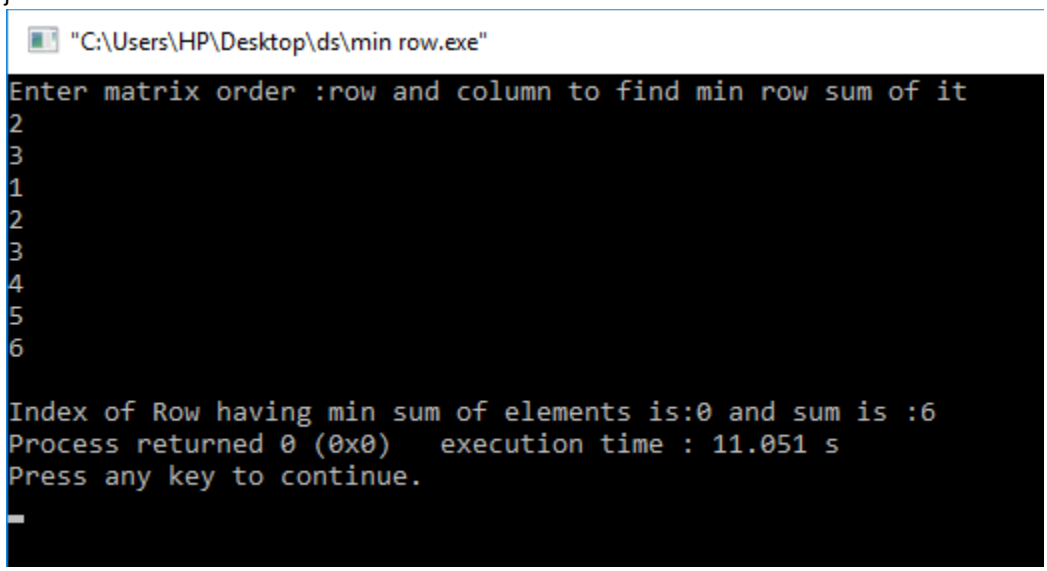

```
/*program to find the Trace of Matrix*/
#include<stdio.h>
int main()
{printf("Enter matrix order :row and column to find Trace of it\n");
int r,c;
scanf("%d%d",&r,&c);
int a,b,sum=0,matrix[r][c];
for(a=0;a<r;a++)
for(b=0;b<c;b++)
{scanf("%d",&matrix[a][b]);
if(a==b)
sum+=matrix[a][b];
}
printf("Trace of matrix:%d",sum);
return 0;
}
```



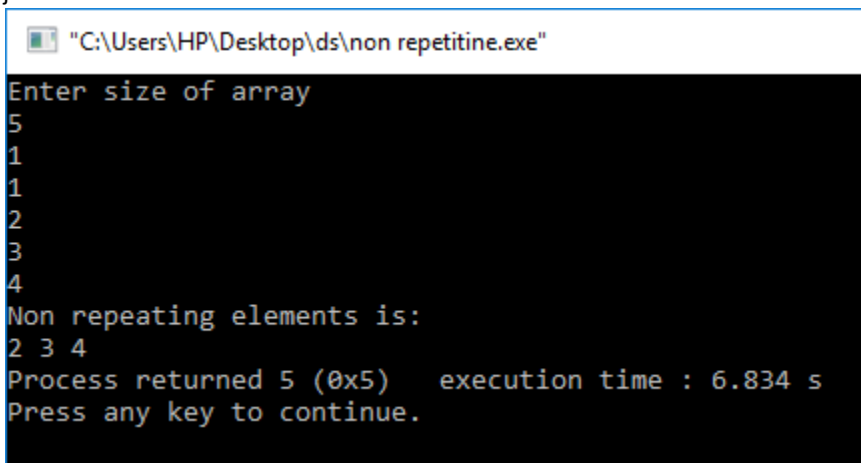
```
/*Program to Reverse an Array*/
#include<stdio.h>
int main()
{printf("Enter an Array size to Reverse It\n");
int sz;
scanf("%d",&sz);
int arr[sz],i,j;
printf("Initial Array\n");
for(i=0;i<sz;i++)
scanf("%d",&arr[i]);
int tmp;
for(i=0,j=sz-1;i<j;i++,j--)
{tmp=arr[i];
arr[i]=arr[j];
arr[j]=tmp;
}
printf("Array after Reversing\n");
for(i=0;i<sz;i++)
printf("%d",arr[i]);
}
```



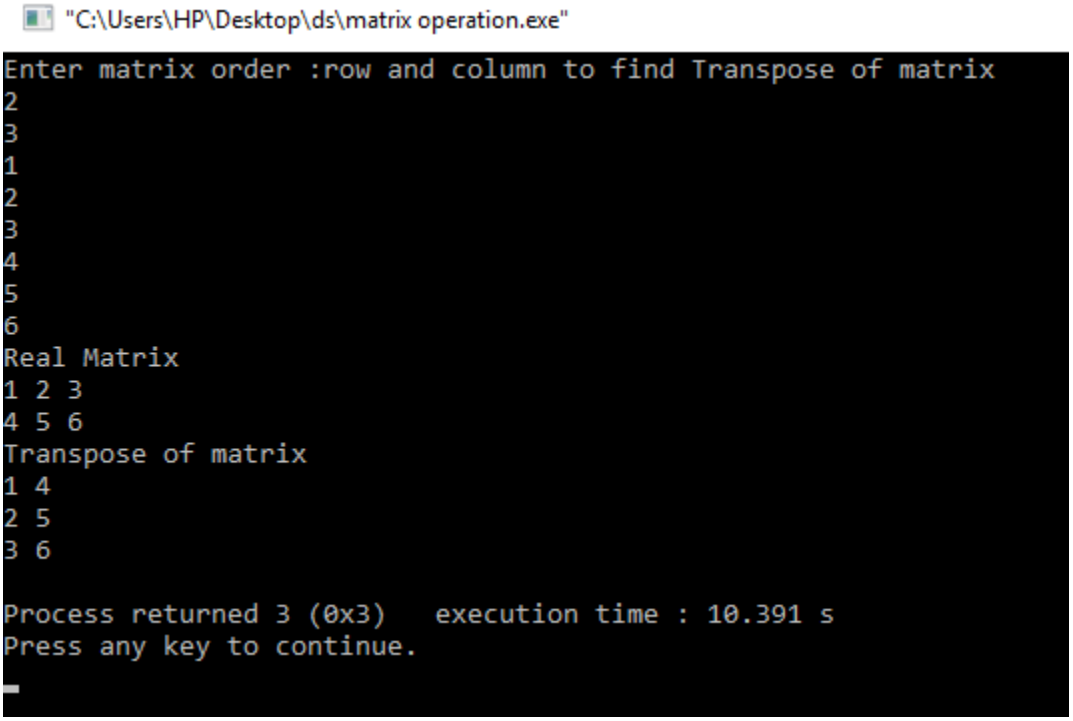
```
/*program to find the row having minimum sum of elements of a Matrix*/
#include<stdio.h>
int main()
{printf("Enter matrix order :row and column to find Trace of it\n");
int r,c,tmp=0;
scanf("%d%d",&r,&c);
int a,min_r=0,b,sum=0,matrix[r][c];
for(a=0;a<r;a++)
{for(b=0;b<c;b++)
{scanf("%d",&matrix[a][b]);
sum+=matrix[a][b];
}if(!a)
tmp=sum;
else
{tmp=tmp<sum?tmp:sum;
if(tmp==sum)
   min_r=a;
}}
printf("\nIndex of Row having min sum of elements is:%d and sum is :%d",min_r,tmp);
return 0;
}
```



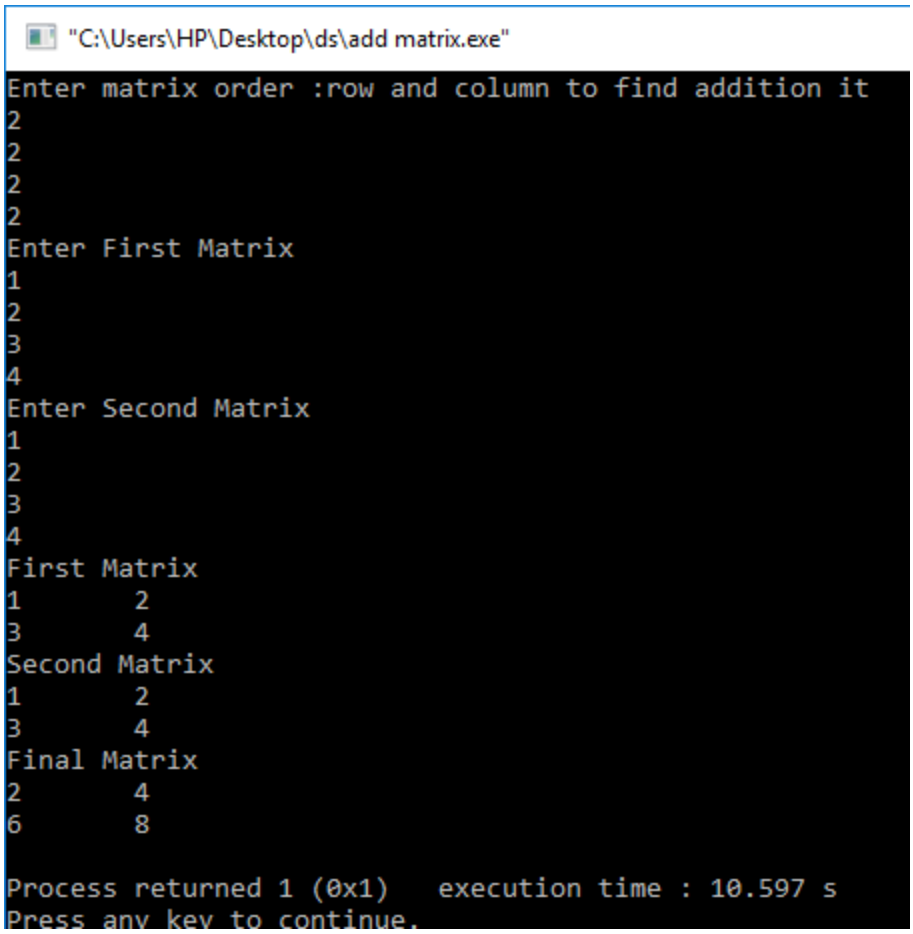
```
/*Program to Find the Non-Repeating Elements of Array*/
#include<stdio.h>
int main()
{printf("Enter size of array\n");
int sz,count=0;
scanf("%d",&sz);
int a,b,arr[sz];
for(a=0;a<sz;a++)
scanf("%d",&arr[a]);
printf("Non repeating elements is:\n");
for(a=0;a<sz;a++)
{for(b=0;b<sz;b++)
if( a!=b && arr[a]==arr[b])
++count;
if(!count)
printf("%d ",arr[a]);
count=0;
}
}
```



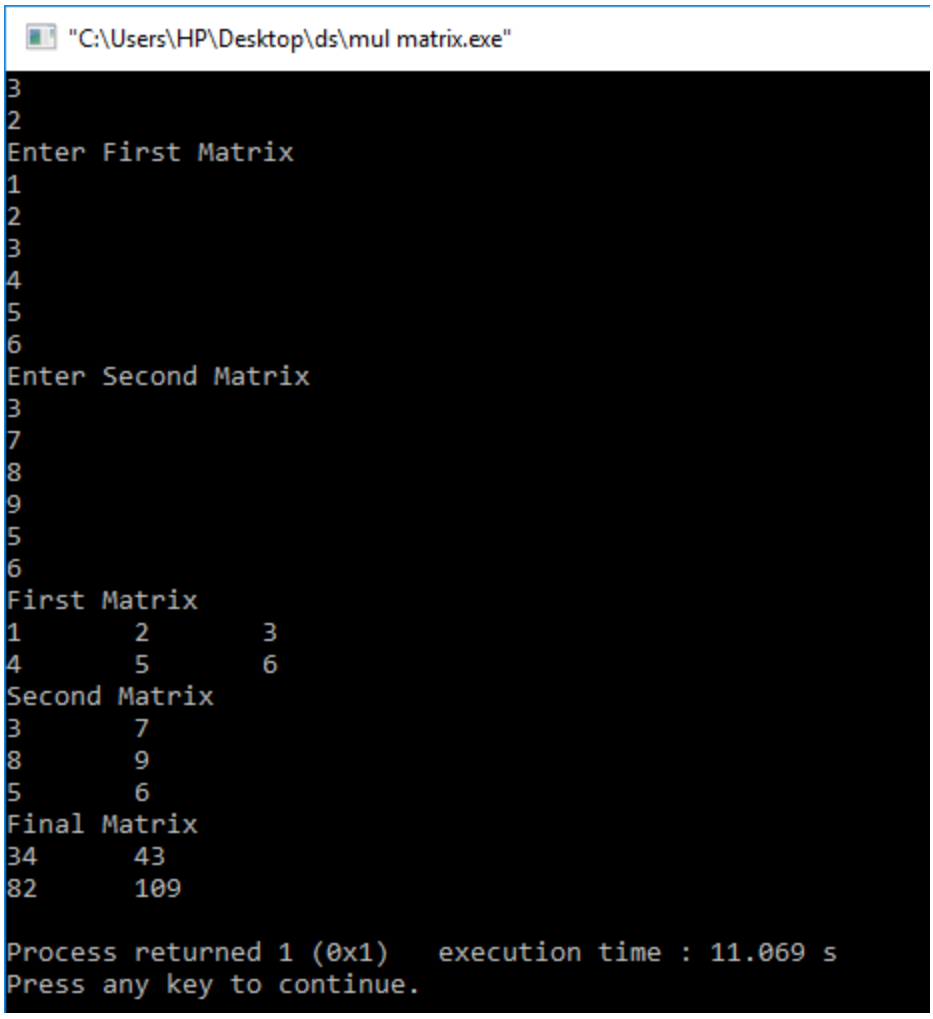
```
/*program to find the Transpose of Matrix*/
#include<stdio.h>
int main()
{printf("Enter matrix order :row and column to find Transpose of matrix\n");
int r,c;
scanf("%d%d",&r,&c);
int a,b,matrix[r][c];
for(a=0;a<r;a++)
for(b=0;b<c;b++)
scanf("%d",&matrix[a][b]);
printf("Real Matrix\n");
for(a=0;a<r;a++)
{for(b=0;b<c;b++)
printf("%d ",matrix[a][b]);
printf("\n");
}
printf("Transpose of matrix\n");
int transpose[c][r];
for(a=0;a<r;a++)
for(b=0;b<c;b++)
transpose[b][a]=matrix[a][b];
for(a=0;a<c;a++)
{for(b=0;b<r;b++)
printf("%d ",transpose[a][b]);
printf("\n");
}
}
```



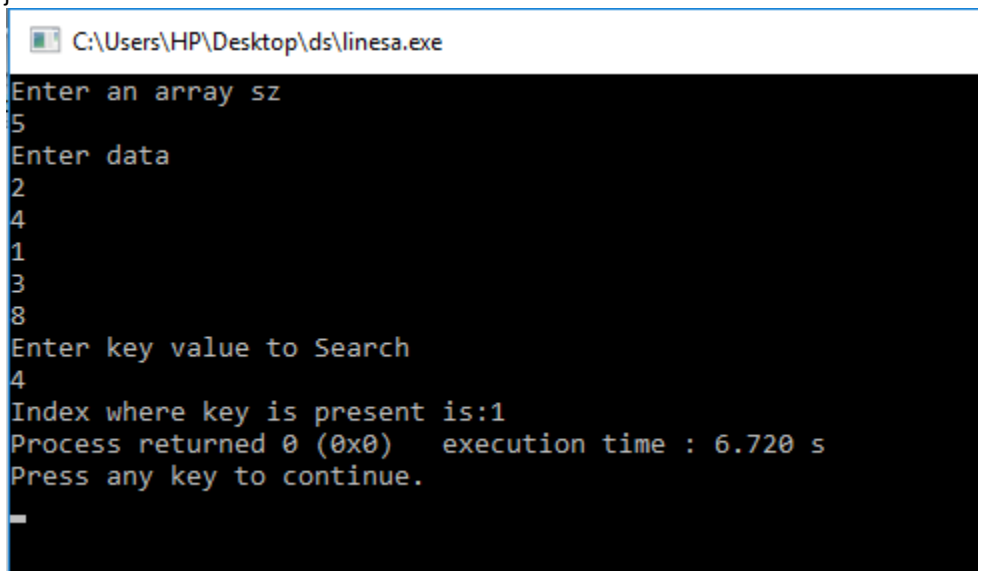
```
/*Program to do addition of Matrix*/
#include<stdio.h>
int main()
{printf("Enter matrix order :row and column to find addition it\n");
int r,c,r1,c1;
scanf("%d%d%d%d",&r,&c,&r1,&c1);
if(r!=r1 || c!=c1)
{
   printf("Matrix addition is not possible\n");
   return 0;
}
int a,b,mat1[r][c],mat2[r1][c1];
printf("Enter First Matrix\n");
for(a=0;a<r;a++)
for(b=0;b<c;b++)
scanf("%d",&mat1[a][b]);
printf("Enter Second Matrix\n");
for(a=0;a<r;a++)
for(b=0;b<c;b++)
scanf("%d",&mat2[a][b]);
int nmat[r][c];
for(a=0;a<r;a++)
for(b=0;b<c;b++)
nmat[a][b]=mat1[a][b]+mat2[a][b];
printf("First Matrix\n");
for(a=0;a<r;a++)
{for(b=0;b<c;b++)
printf("%d\t",mat1[a][b]);
printf("\n");
}
printf("Second Matrix\n");
for(a=0;a<r;a++)
{for(b=0;b<c;b++)
printf("%d\t",mat2[a][b]);
printf("\n");
}
printf("Final Matrix\n");
for(a=0;a<r;a++)
{for(b=0;b<c;b++)
printf("%d\t",nmat[a][b]);
printf("\n");
}
}
```


"C:\Users\HP\Desktop\ds\add matrix.exe"
Enter matrix order :row and column to find addition it
2
2
2
2
Enter First Matrix
1
2
3
4
Enter Second Matrix
1
2
3
4
First Matrix
1 2
3 4
Second Matrix
1 2
3 4
Final Matrix
2 4
6 8
Process returned 1 (0x1) execution time : 10.597 s
Press any key to continue.

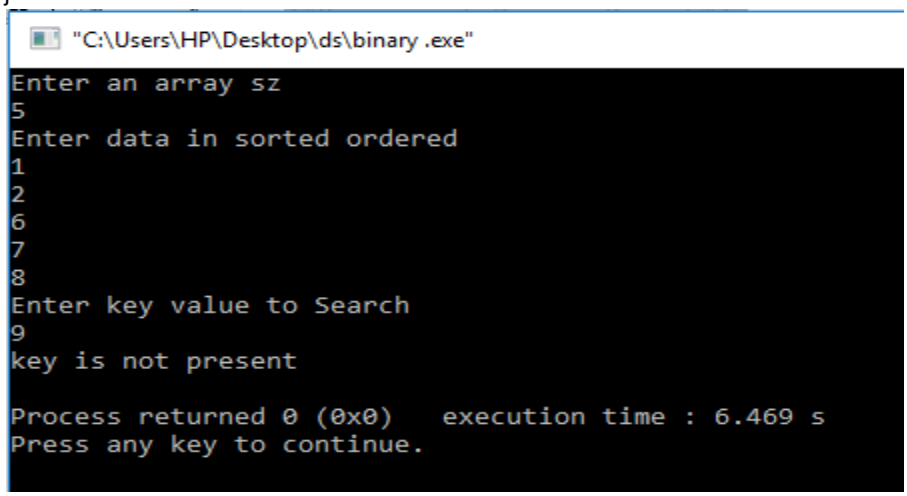
```
/*program to do matrix mul of Matrix*/
#include<stdio.h>
int main()
{printf("Enter matrix order :row and column to find mul of it\n");
int r,c,r1,c1;
scanf("%d%d%d%d",&r,&c,&r1,&c1);
if(c!=r1)
{
   printf("Matrix Multiplication is not possible\n");
   return 0;
}
int a,b,mat1[r][c],mat2[r1][c1];
printf("Enter First Matrix\n");
for(a=0;a<r;a++)
for(b=0;b<c;b++)
scanf("%d",&mat1[a][b]);
printf("Enter Second Matrix\n");
for(a=0;a<r1;a++)
for(b=0;b<c1;b++)
scanf("%d",&mat2[a][b]);
int nmat[r][c1],d;
for(a=0;a<r;a++)
{
   for(b=0;b<c1;b++)
   {nmat[a][b]=0;
      for(d=0;d<c;d++)
      nmat[a][b]+=mat1[a][d]*mat2[d][b];
      }}
printf("First Matrix\n");
for(a=0;a<r;a++)
{for(b=0;b<c;b++)
printf("%d\t",mat1[a][b]);
printf("\n");
}
printf("Second Matrix\n");
for(a=0;a<r1;a++)
{for(b=0;b<c1;b++)
printf("%d\t",mat2[a][b]);
printf("\n");
}
printf("Final Matrix\n");
for(a=0;a<r;a++)
{for(b=0;b<c1;b++)
printf("%d\t",nmat[a][b]);
printf("\n");
}
}
```


"C:\Users\HP\Desktop\ds\mul matrix.exe"
3
2
Enter First Matrix
1
2
3
4
5
6
Enter Second Matrix
3
7
8
9
5
6
First Matrix
1 2 3
4 5 6
Second Matrix
3 7
8 9
5 6
Final Matrix
34 43
82 109
Process returned 1 (0x1) execution time : 11.069 s
Press any key to continue.

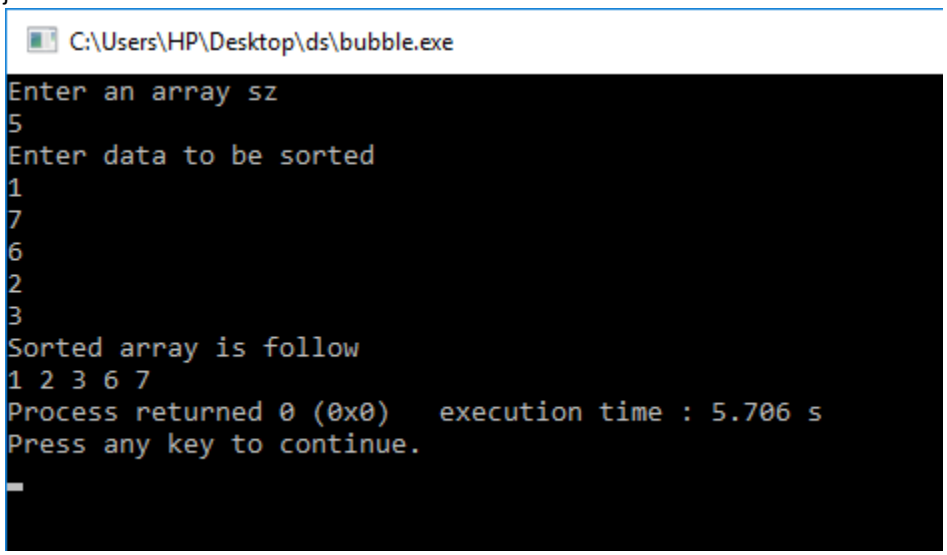
```
/*Program of Linear Search*/
#include<stdio.h>
int main()
{
printf("Enter an array sz\n");
int sz;
scanf("%d",&sz);
int a,arr[sz];
printf("Enter data\n");
for(a=0;a<sz;a++)
scanf("%d",&arr[a]);
printf("Enter key value to Search\n");
int key;
scanf("%d",&key);
for(a=0;a<sz;a++)
   if(arr[a]==key)
{printf("Index where key is present is:%d",a);
return 0;
}
printf("Key is Not Present\n")
return 0;
}
```



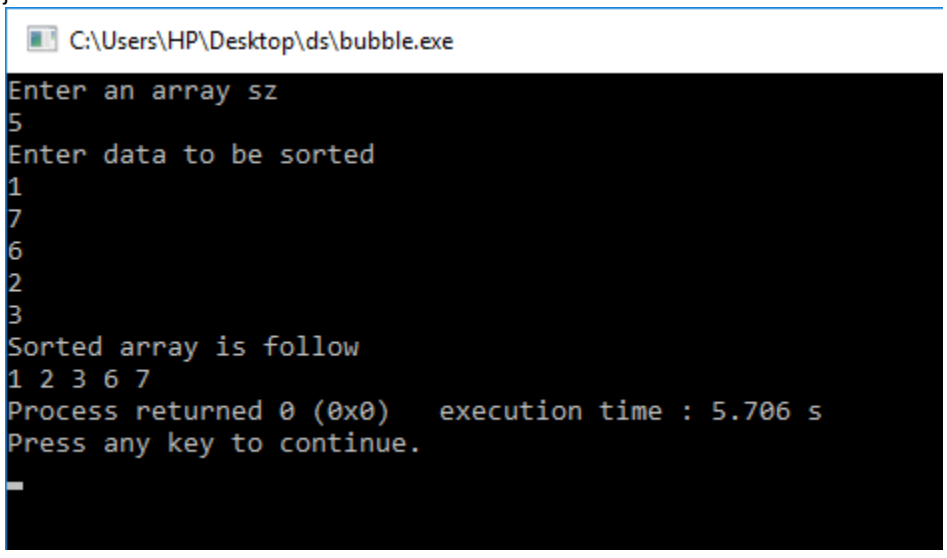
```
/*Program of Binary Search*/
#include<stdio.h>
int b_search(int,int*,int);
int main()
{printf("Enter an array sz\n");
int sz;
scanf("%d",&sz);
int a,arr[sz];
printf("Enter data in sorted ordered\n");
for(a=0;a<sz;a++)
scanf("%d",&arr[a]);
printf("Enter key value to Search\n");
int key;
scanf("%d",&key);
int value=b_search(key,arr,sz);
if(value!=-1)
printf("Index Where key is present is:%d",value);
else
printf("key is not present\n");
return 0;
}
int b_search(int key,int *a,int sz)
{int mid,l=0,r=sz-1;
while(l<=r)
{mid=(l+r)/2;
if(a[mid]==key)
return mid;
else if(a[mid]>key)
r=mid-1;
else
l=mid+1;
}
return -1;
}
```



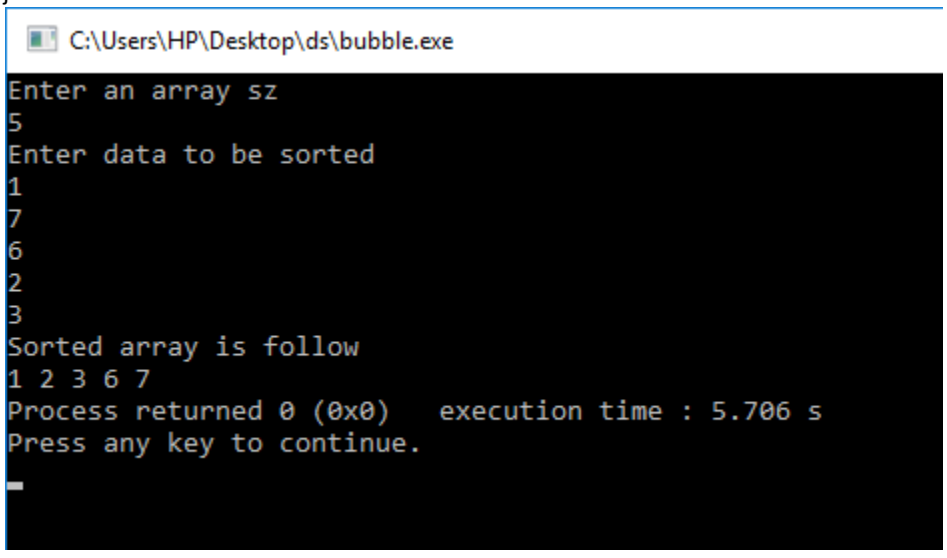
```
/*Program of selection sort*/
#include<stdio.h>
int main()
{printf("Enter an array sz\n");
int sz;
scanf("%d",&sz);
int a,b,tmp,arr[sz];
printf("Enter data to be sorted\n");
for(a=0;a<sz;a++)
scanf("%d",&arr[a]);
for(a=0;a<sz-1;a++)
   for(b=a+1;b<sz;b++)
   if(arr[a]>arr[b])
   tmp=arr[a],arr[a]=arr[b],arr[b]=tmp;
printf("Sorted array is follow\n");
for(a=0;a<sz;a++)
   printf("%d ",arr[a]);
return 0;
}
```



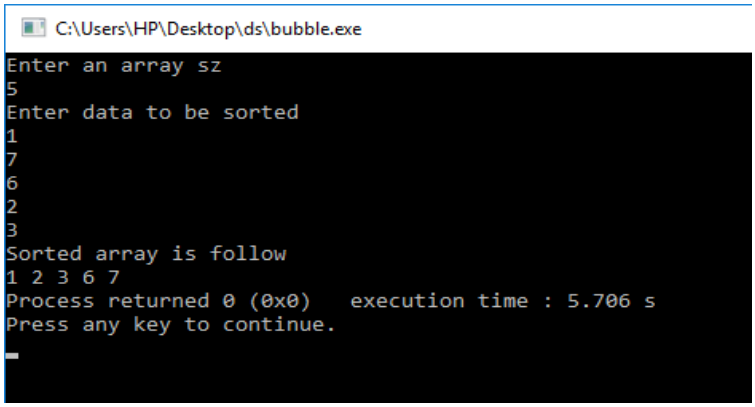
```
/*program of Bubble Sort*/
#include<stdio.h>
int main()
{printf("Enter an array sz\n");
int sz;
scanf("%d",&sz);
int a,b,tmp,arr[sz];
printf("Enter data in to be sorted\n");
for(a=0;a<sz;a++)
scanf("%d",&arr[a]);
int count =0;
for(a=0;a<sz-1;a++)
{
for(b=0;b<sz-a-1;b++)
{if(arr[b]>arr[b+1])
{tmp=arr[b],arr[b]=arr[b+1],arr[b+1]=tmp;
++count;
}}
if(!count)
   break;
count=0;
}
printf("Sorted array is as Follow\n");
for(a=0;a<sz;a++)
   printf("%d ",arr[a]);
return 0;
}
```



```
/*Program of Insert Sort*/
#include<stdio.h>
int main()
{printf("Enter an array sz\n");
int sz;
scanf("%d",&sz);
int a,b,tmp,arr[sz];
printf("Enter data in to be sorted\n");
for(a=0;a<sz;a++)
scanf("%d",&arr[a]);
for(a=0;a<sz-1;a++)
{
   tmp=arr[a+1];
   for(b=a+1;b>0;b--)
   {
      if(arr[b]<arr[b-1])
         tmp=arr[b-1],arr[b-1]=arr[b],arr[b]=tmp;
      else break;
   }

}
printf("Sorted array is as Follow\n");
for(a=0;a<sz;a++)
   printf("%d ",arr[a]);
return 0;
}
```

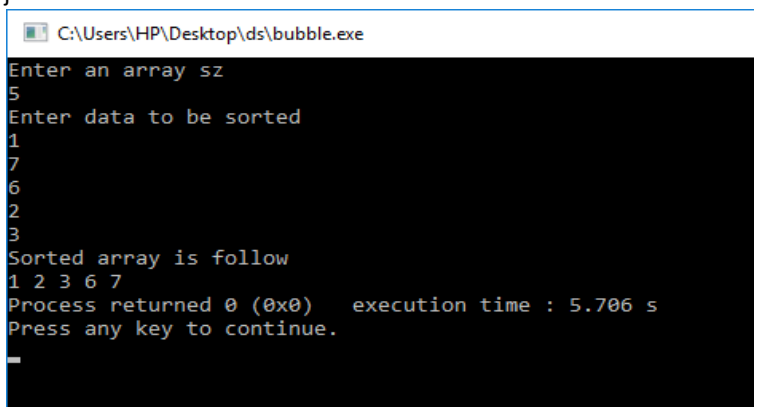


```
/*Program to sort a array using Quick Sort*/
#include<stdio.h>
void quick(int *,int ,int );
int partition(int *,int ,int );
int main()
{printf("Enter Size of Array\n");
int s;
scanf("%d",&s);
int a,arr[s];
for(a=0;a<s;a++)
scanf("%d",&arr[a]);
quick(arr,0,s-1);
for(a=0;a<s;a++)
   printf("%d ",arr[a]);
return 0;
}
void quick(int *a,int first,int last)
{int q;
   if(first<last)
   {
      q=partition(a,first,last);
      quick(a,first,q-1);
      quick(a,q+1,last);
   }
}
int partition(int *a,int f,int l)
{
   int b,tmp,i=f-1,j;
for(j=f;j<l;j++)
{
  if(a[j]<=a[l])
{++i;
   tmp=a[i],a[i]=a[j],a[j]=tmp;

}}
tmp=a[i+1],a[i+1]=a[l],a[l]=tmp;
return i+1;
}
```

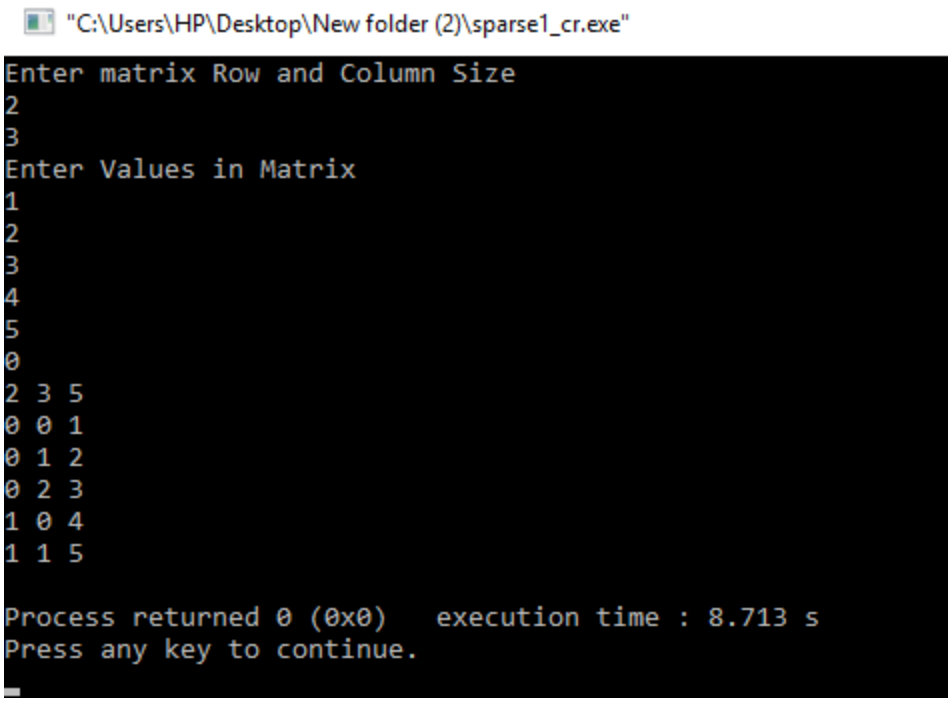



```
/*Program to sort a array using merge sort*/
#include<stdio.h>
void merge(int * ,int,int ,int *);
void mrg(int *,int,int,int,int *);
void copy(int *,int,int ,int *);
int main()
{
printf("Enter size\n");
int s,q;
scanf("%d",&s);
int arr[s],ar[s];
for(q=0;q<s;q++)
scanf("%d",&arr[q]);
merge(arr,0,s-1,ar);
for(q=0;q<s;q++)
   printf("%d ",arr[q]);
}
void merge(int *a,int s,int l,int *ar)
{int mid;
if(s<l)
{mid=(s+l)/2;
merge(a,s,mid,ar);
merge(a,mid+1,l,ar);
mrg(a,s,mid,l,ar);
}
}
void mrg(int *a,int s,int mid,int l,int *ar)
{int i=s,j=mid+1,n=s;
   while(i<=mid && j<=l)
   {
      if(a[i]<=a[j])
         ar[n++]=a[i++];
```

```
      else if(a[i]>=a[j])
         ar[n++]=a[j++];
}
while(i<=mid)
   ar[n++]=a[i++];
while(j<=l)
   ar[n++]=a[j++];
copy(a,s,l,ar);
}
void copy(int *a,int s,int l,int *ar)
{int x;
   for(x=s;x<=l;x++)
      a[x]=ar[x];
}
```

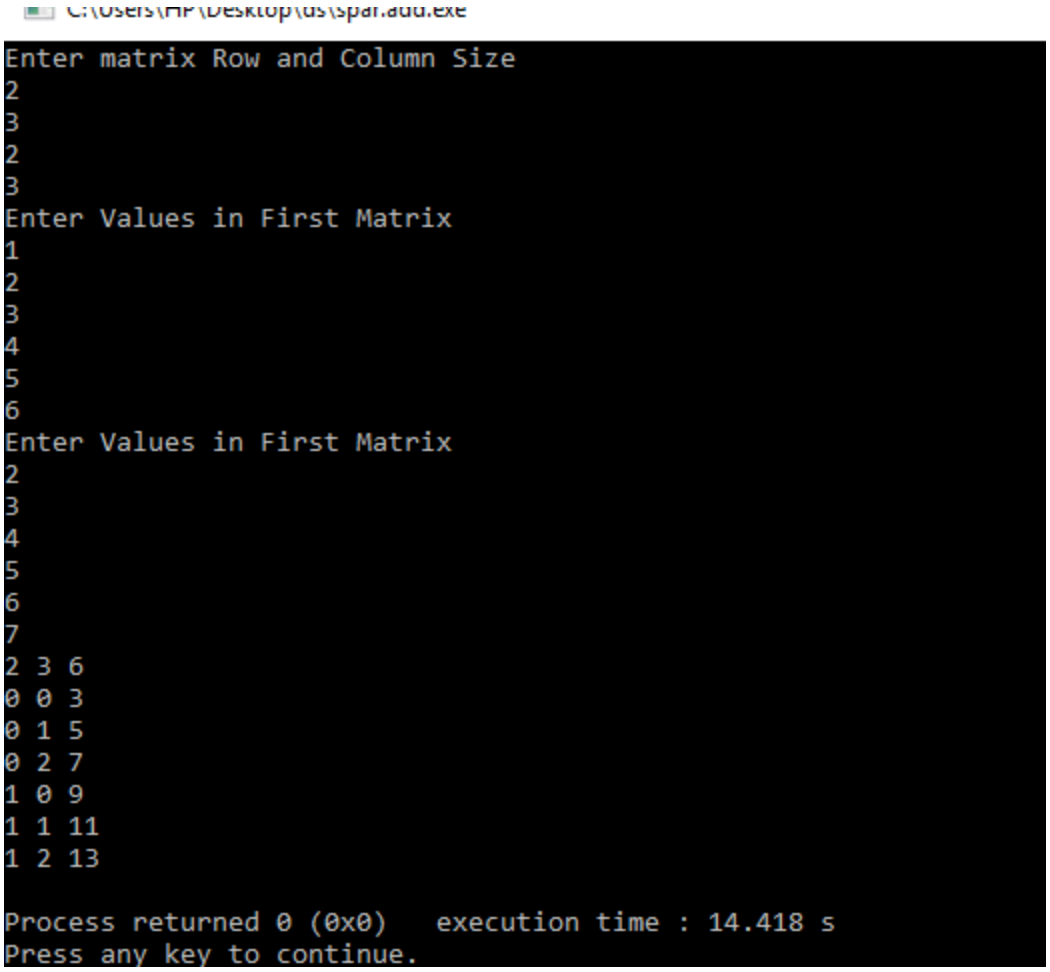


```
/*Creation of Sparse Matrix*/
#include<stdio.h>
#include<stdlib.h>
struct matrix* create(int (*)[],int ,int);
struct matrix{
int row;
int col;
int value;
};
int c;
int main()
{printf("Enter matrix Row and Column Size\n");
int r;
scanf("%d%d",&r,&c);
int arr[r][c],i,j,tmp;
printf("Enter Values in Matrix\n");
for(i=0;i<r;i++)
   for(j=0;j<c;j++)
{scanf("%d",&tmp);
   arr[i][j]=tmp;
}
struct matrix *t=create(arr,r,c);
for(i=0;i<=t[0].value;i++)
   printf("%d %d %d\n",t[i].row,t[i].col,t[i].value);
   free(t);
return 0;
}
struct matrix *create(int (*a)[c],int r,int c)
{int sz=1;
   struct matrix *t=(struct matrix *)malloc(sz*sizeof(struct matrix));
   int i,j,n=0;
for(i=0;i<r;i++)
   for(j=0;j<c;j++)
   if(a[i][j])
  {t=realloc(t,++sz*sizeof(struct matrix));
   t[++n].row=i,t[n].col=j,t[n].value=a[i][j];
}t[0].value=n,t[0].row=r,t[0].col=c;
return t;
}
```




```
/*Addition of Sparses Matrix*/
#include<stdio.h>
#include<stdlib.h>
struct matrix{
int row;
int col;
int value;
};
int c;
struct matrix* create(int (*)[],int ,int );
struct matrix*add(struct matrix *,struct matrix *);
int main()
{printf("Enter matrix Row and Column Size\n");
int r,r1,c1;
scanf("%d%d%d%d",&r,&c,&r1,&c1);
if(r1!=r || c1!=c)
{
   printf("Matrix addition is not valid\n");    return 0;

}
int arr[r][c],arr1[r1][c1],i,j,tmp;
printf("Enter Values in First Matrix\n");
for(i=0;i<r;i++)
   for(j=0;j<c;j++)
scanf("%d",&arr[i][j]);
```

```
struct matrix *t=create(arr,r,c);
printf("Enter Values in First Matrix\n");
for(i=0;i<r1;i++)
   for(j=0;j<c1;j++)
scanf("%d",&arr1[i][j]);
struct matrix *t2=create(arr1,r1,c1);
struct matrix *t3=add(t,t2);
for(i=0;i<=t[0].value;i++)
   printf("%d %d %d\n",t3[i].row,t3[i].col,t3[i].value);
   free(t);
return 0;
}
struct matrix *create(int (*a)[c],int r,int c)
{int sz=1;
   struct matrix *t=(struct matrix *)malloc(sz*sizeof(struct matrix));
   int i,j,n=0;
for(i=0;i<r;i++)
   for(j=0;j<c;j++)
   if(a[i][j])
  {t=realloc(t,++sz*sizeof(struct matrix));
   t[++n].row=i,t[n].col=j,t[n].value=a[i][j];
}t[0].value=n,t[0].row=r,t[0].col=c;
return t;
}
struct matrix *add(struct matrix *t1,struct matrix *t2)
{int s=1,r=1,n=0;
struct matrix *t=(struct matrix *)malloc((t1[0].value+t2[0].value)*sizeof(struct matrix));
   while(s<=t1[0].value && r<=t2[0].value)
   if(t1[s].row>t2[r].row)
      t[++n].row=t2[r].row,t[n].col=t2[r].col,t[n].value=t2[r++].value;
   else if(t1[s].row<t2[r].row)
   t[++n].row=t1[s].row,t[n].col=t1[s].col,t[n].value=t1[s++].value;
else{
   if(t1[s].col<t2[r].col)
      t[++n].row=t1[s].row,t[n].col=t1[s].col,t[n].value=t1[s++].value;
else if(t1[s].col>t2[r].col)
t[++n].row=t2[r].row,t[n].col=t2[r].col,t[n].value=t2[r++].value;
else
t[++n].row=t1[s].row,t[n].col=t1[r].col,t[n].value=t1[s++].value+t2[r++].value;
}
while(s<=t1[0].value)
   t[++n].row=t1[s].row,t[n].col=t1[s].col,t[n].value=t1[s++].value;
while(r<=t2[0].value)
t[++n].row=t2[r].row,t[n].col=t2[r].col,t[n].value=t2[r++].value;
t[0].value=n;t[0].row=t1[0].row;t[0].col=t1[0].col;
return t;}
```




```
/*Program to add sparse polynomial*/
#include<stdio.h>
struct poly{
int  cof;
int expo;
};
void add(struct poly*,struct poly *,struct poly *,int ,int, int *);
int main()
{
printf("Enter sz of polynomials");
int s1,s2,n=0;
scanf("%d%d",&s1,&s2);
printf("Enter first Polynomial: cof and expo\n");
struct poly p1[s1];
struct poly pp1[s1];
int a;
for(a=0;a<s1;a++)
```

```
{scanf("%d%d",&p1[a].cof,&p1[a].expo);
if(p1[a].cof)
{pp1[n].expo=p1[a].expo;
pp1[n++].cof=p1[a].cof;
}}
s1=n;n=0;
printf("Enter 2nd Polynomial:cof and expo\n");
struct poly p2[s2];
struct poly pp2[s2];
for(a=0;a<s2;a++)
{scanf("%d%d",&p2[a].cof,&p2[a].expo);
if(p2[a].cof)
{pp2[n].expo=p2[a].expo;
pp2[n++].cof=p2[a].cof;
}}s2=n;
struct poly pp3[s1+s2];int s3;
add(pp1,pp2,pp3,s1,s2,&s3);
printf("First poly as Follow:Expo and cof\n");
for(a=0;a<s1;a++)
   printf("%d  %d\n",pp1[a].expo,pp1[a].cof);
printf("2nd poly as Follow:Expo and cof\n");
for(a=0;a<s2;a++)
   printf("%d  %d\n",pp2[a].expo,pp2[a].cof);
printf("Added poly as Follow:Expo and cof\n");
for(a=0;a<s3;a++)
   printf("%d  %d\n",pp3[a].expo,pp3[a].cof);

return 0;
}
void add(struct poly *p1,struct poly *p2,struct poly *p3,int s1,int s2,int *s3)
{int s=0,r=0,n=0;
while(s<s1 && r<s2)
{
if(p1[s].expo>p2[r].expo)
p3[n].expo=p1[s].expo,p3[n++].cof=p1[s++].cof;
else if(p1[s].expo<p2[r].expo)
p3[n].expo=p2[s].expo,p3[n++].cof=p2[r++].cof;
else
if(p1[s].cof+p2[r].cof)
{
   p3[n].expo=p1[s].expo;p3[n++].cof=p1[s++].cof+p2[r++].cof;
}
else
{++s;++r;
}
}
while(s<s1)
p3[n].expo=p1[s].expo,p3[n++].cof=p1[s++].cof;
```

```
while(r<s2)
p3[n].expo=p2[s].expo,p3[n++].cof=p2[r++].cof;
*s3=n;
}
```

"C:\Users\HP\Desktop\ds\poly add.exe"

```
1
2
0
0
Enter 2nd Polynomial:cof and expo
2
5
4
6
6
7
First poly as Follow:Expo and cof
4  1
3  1
2  1
2nd poly as Follow:Expo and cof
5  2
6  4
7  6
Added poly as Follow:Expo and cof
5  2
5  4
5  6
4  1
3  1
2  1

Process returned 0 (0x0)   execution time : 22.695 s
Press any key to continue.
```

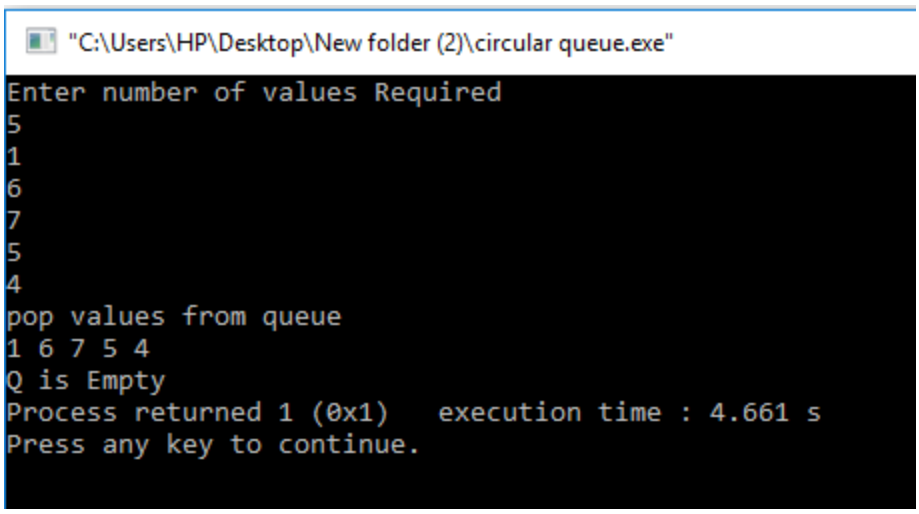
```
/*postfix Evaluation*/
#include<stdio.h>
#include<string.h>
void check(char);
int stack[30];
void push(int );
int pop();
int top=-1;
int main()
{printf("Enter Expression to evaluate in postfix\n");
char postfix[26];
gets(postfix);
int a;
for(a=0;a<strlen(postfix);a++)
check(postfix[a]);
printf("value is:%d",pop());
return 0;
}
void check(char a)
{int n,z;
switch(a)
{
case '+':
n=pop();z=pop();
push(z+n);
break;
case '-':
n=pop();z=pop();
push(z-n);
break;
case '*':
n=pop();z=pop();
push(z*n);
break;
case '/':
n=pop();z=pop();
push(z/n);
break;
case '%':
n=pop();z=pop();
push(z%n);
break;
default:push(a-'0');
}

}
void push(int key)
{
```

```
  if(top==30)
  {
     printf("Stack full");
     exit(1);
  }
  stack[++top]=key;
  }
  int pop()
  {

     if(top==-1)
     {
        printf("Stack is empty");
        return -1;
     }
     return stack[top--];
  }
```

```
C:\Users\HP\Desktop\ds\postdix.exe
Enter Expression to evaluate in postfix
23+5+6*
value is:60
Process returned 0 (0x0)   execution time : 9.239 s
Press any key to continue.
```

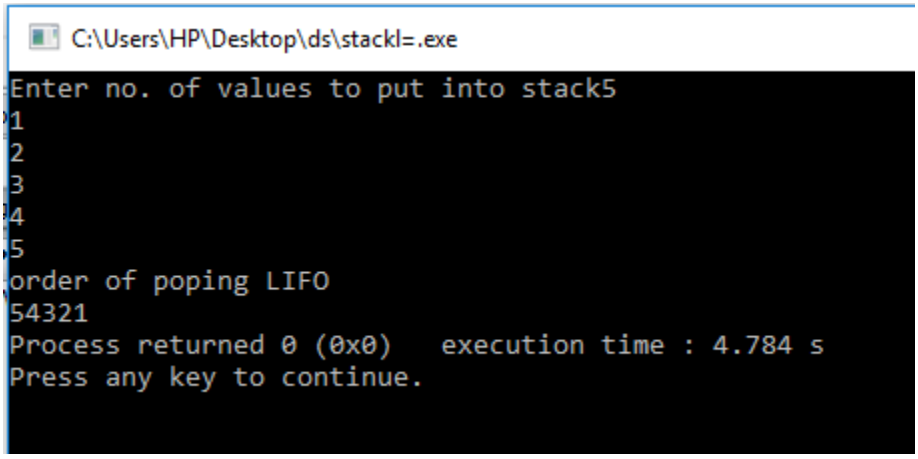
```
/*Program of Circular Queue*/
#include<stdio.h>
#include<stdlib.h>
void isempty();
void isfull();
static int x;
int pop();
void push(int);
int front,rear;
int *queue,capacity=1;
int main()
{queue=(int *)malloc(sizeof(int));
   int a,n;
   printf("Enter number of values Required\n");
   int sz;
   scanf("%d",&sz);
   for(a=0;a<sz;a++)
   {scanf("%d",&n);
      push(n);
```

```
   }
   printf("pop values from queue\n");
   for(a=0;a<=sz;a++)
   printf("%d ",pop());

return 0;
}
void push(int value)
{
if(front==rear && x==capacity)
isfull();
rear=(rear+1)%capacity;  //********************
++x;
queue[rear]=value;
}
void isfull()
{
capacity*=2;
int *tmp,*que=(int *)malloc(sizeof(int)*capacity);
int a,n=1;
for(a=front+1;a<capacity/2;a++)
que[n++]=queue[a];
for(a=0;a<=rear;a++)
que[n++]=queue[a];
front=0;
rear=n-1;
tmp=queue;
queue=que;
free(tmp);
tmp=NULL;
que=NULL;
}
int pop()
{if(rear==front && x==0)
      isempty();
 front=(front+1)%capacity;     //*************
      --x;
   return queue[front];
}
void isempty()
{
   printf("\nQ is Empty");
   exit(1);
}
```




```
/*program of stack*/
#include<stdio.h>
#include<string.h>
int stack[30];void push(int );
int pop();
int top=-1;
int main()
{int v;
printf("Enter no. of values to put into stack");
int a,value;
scanf("%d",&a);
for(v=0;v<a;v++)
{scanf("%d",&value);
push(value);
}
printf("order of poping LIFO\n");
for(v=0;v<a;v++)
printf("%d",pop());
return 0;
}
void push(int key)
{
   if(top==30)
   {
      printf("Stack full");
      exit(1);
   }
   stack[++top]=key;
   }
   int pop()
   {
```

```
    if(top==-1)
    {
       printf("Stack is empty");
       return -1;
    }
    return stack[top--];
}
```




```
/*Creation and Transversal of Linked list*/
#include<stdio.h>
#include<stdlib.h>
struct ll{
int info;
struct ll *next;
};
struct ll*create(int );
void transverse(struct ll*);
int main()
{printf("Enter sz of ll to create it");
int sz;
scanf("%d",&sz);
struct ll*l=create(sz);
transverse(l);
return 0;
}
struct ll *create(int sz)
{if(!sz)
return NULL;
struct ll *tmp,*tmp2,*q=(struct ll *)malloc(sizeof(struct ll));
int value;
printf("Enter key value\n");
```

```
scanf("%d",&value);
q->info=value;
if(!q)
{printf("No mm");return NULL;}
tmp2=q;
while(sz-1)
{tmp=(struct ll *)malloc(sizeof(struct ll));
if(!tmp){printf("No mm");return NULL;}
tmp2->next=tmp;
printf("Enter key value\n");
scanf("%d",&value);
tmp->info=value;
tmp2=tmp;
--sz;
}
tmp2->next=NULL;
return q;
}
void transverse(struct ll*p)
{if(!p)
return ;
struct ll*tmp=p;
while(tmp)
  {
     printf("\n%d",tmp->info);
     tmp=tmp->next;
  }
  }
```

C:\Users\HP\Desktop\ds\Untitled7.exe

```
Enter sz of ll to create it5
Enter key value
1
Enter key value
3
Enter key value
2
Enter key value
5
Enter key value
4

1
3
2
5
4
Process returned 0 (0x0)   execution time : 3.553 s
Press any key to continue.
```

```
/*Creation , Transversal ,Inserton and Deletion of LLS*/
#include<stdio.h>
#include<stdlib.h>
struct ll{
int info;
struct ll *next;
};
struct ll*create(int );
void transverse(struct ll*);
struct ll*delete(struct ll*);
struct ll*insert_b(struct ll*,struct ll*,int );
int main()
{printf("Enter sz of ll to create it\n");
int sz;
scanf("%d",&sz);
struct ll*l=create(sz);
printf("Before Insertion\n");
transverse(l);
printf("\nEnter a key value to insert and node no,\n");
int value,n;
scanf("%d%d",&value,&n);
struct ll*tmp=l;
int a;
for(a=0;a<n-1;a++)
   tmp=tmp->next;
l=insert_b(tmp,l,value);
printf("After Insertion\n");
transverse(l);
printf("\nif Wanted to deltte LL press 1\n");
scanf("%d",&a);
if(a==1)
  {
  l=delete(l);
   transverse(l);
}
return 0;
}
struct ll *create(int sz)
{if(!sz)
return NULL;
struct ll *tmp,*tmp2,*q=(struct ll *)malloc(sizeof(struct ll));
int value;
printf("Enter key value\n");
scanf("%d",&value);
q->info=value;
if(!q)
{printf("No mm");return NULL;}
tmp2=q;
```

```
while(sz-1)
{tmp=(struct ll *)malloc(sizeof(struct ll));
if(!tmp){printf("No mm");return NULL;}
tmp2->next=tmp;
printf("Enter key value\n");
scanf("%d",&value);
tmp->info=value;
tmp2=tmp;
--sz;
}
tmp2->next=NULL;
return q;
}
void transverse(struct ll*p)
{if(!p)
{
   printf("LL is Empty\n");
return ;
}struct ll*tmp=p;
while(tmp)
   {
      printf("\n%d",tmp->info);
      tmp=tmp->next;
   }
   }
   struct ll* insert_b(struct ll*x,struct ll*p,int key)
{if(!x) //Necessary*
return p ;
   struct ll*tmp2=(struct ll*)malloc(sizeof(struct ll));
   if(!tmp2)
   return NULL;
if(x==p)
{tmp2->next=x;
tmp2->info=key;
p=tmp2;
return p;
}
struct ll*tmp=p;
while(tmp &&tmp->next!=x)
 tmp=tmp->next;
 if(!tmp)
 {
    printf("\nNode is not present after which we have to insert");
 return p;
 }
tmp2->next=x;
tmp->next=tmp2;
tmp2->info=key;
```

```
 return p;
}
struct ll*delete(struct ll*q)
{struct ll*tmp;
   while(q)
    {tmp=q;
   q=q->next;
   free(tmp);
   }
return q;
}
```

```
Enter sz of ll to create it
5
Enter key value
1
Enter key value
2
Enter key value
5
Enter key value
4
Enter key value
3
Before Insertion

1
2
5
4
3
Enter a key value to insert and node no,
10
1
After Insertion

10
1
2
5
4
3
if Wanted to deltte LL press 1
1
LL is Empty
```