DSA FILE

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DSA

PART-1

Questions on array (1-D, 2-D):

1. Insert data in an array by taking size of array from user and display the data (using C compiler).

```c
#include<stdio.h>
int main()
{
    int size,i,a[' '];
    printf("enter size of array: ");
    scanf("%d",&size);
    for(i=0;i<=size-1;i++)
    {
        printf ("\nenter the data of array: ");
        scanf("%d",&a[i]);
    }
    printf("your array is: ");
    for(i=0;i<=size-1;i++)
    {
        printf("%3d",a[i]);
    }
    return 0;
}
```

2. Insert data in an array by taking size of array from user and display the data reversely (using C compiler).

```c
#include<stdio.h>
int main()
{
    int size,i,a[' '];
    printf("enter size of array: ");
    scanf("%d",&size);
    for(i=0;i<=size-1;i++)
    {
        printf ("\nenter the data of array: ");
        scanf("%d",&a[i]);
    }
    printf("your array is: ");
    for(i=size-1;i>=0;i--)
```

```
    {
        printf("%3d",a[i]);
    }
    return 0;
}
```

3.insert data at last position in an array and display it.

```
#include<stdio.h>
int main()
{
    int size,i,a[' '],data;
    printf("enter size of array: ");
    scanf("%d",&size);
    for(i=0;i<=size-1;i++)
    {
        printf ("\nenter the data of array: ");
        scanf("%d",&a[i]);
    }
    printf("your array is: ");
    for(i=0;i<=size-1;i++)
    {
        printf("%3d",a[i]);
    }
    printf("\nenter data to insert: ");
    scanf("%d",&data);
    a[size]=data;
    size++;
    printf("your final array is:");
     for(i=0;i<=size-1;i++)
    {
        printf("%3d",a[i]);
    }
    return 0;
}
```

4.insert data at begin position in an array and display it.

```
#include<stdio.h>
int main()
{
    int size,i,a[' '],data;
    printf("enter size of array: ");
    scanf("%d",&size);
    for(i=0;i<=size-1;i++)
    {
        printf ("\nenter the data of array: ");
        scanf("%d",&a[i]);
```

```
    }
    printf("your array is: ");
    for(i=0;i<=size-1;i++)
    {
        printf("%3d",a[i]);
    }
    printf("\nenter data to insert: ");
    scanf("%d",&data);
    for(i=size-1;i>=0;i--)
    {
        a[i+1]=a[i];
    }
    a[0]=data;
    size++;
    printf("your final array is:");
     for(i=0;i<=size-1;i++)
    {
        printf("%3d",a[i]);
    }
    return 0;
}
```

5.insert data at any position in an array and display it.

```
#include<stdio.h>
int main()
{
    int size,i,a[' '],data,p;
    printf("enter size of array: ");
    scanf("%d",&size);
    for(i=0;i<=size-1;i++)
    {
        printf ("\nenter the data of array: ");
        scanf("%d",&a[i]);
    }
    printf("your array is: ");
    for(i=0;i<=size-1;i++)
    {
        printf("%3d",a[i]);
    }
    printf("\nenter data to insert: ");
    scanf("%d",&data);
    printf("enter the insertion position:");
    scanf("%d",&p);
    for(i=size-1;i>=p-1;i--)
    {
        a[i+1]=a[i];
    }
```

```
   a[p-1]=data;
    printf("your final array is:");
     for(i=0;i<=size;i++)
    {
        printf("%3d",a[i]);
    }
    return 0;
}
```

6. Create an array & search a data is found or not in that array

```
#include<stdio.h>
int main()
{
    int size,i,a[' '],p,data;
    printf("enter size of array: ");
    scanf("%d",&size);
    for(i=0;i<=size-1;i++)
    {
        printf ("\nenter the data of array: ");
        scanf("%d",&a[i]);
    }
    printf("your array is: ");
    for(i=0;i<=size-1;i++)
    {
        printf("%3d",a[i]);
    }
    printf("\nenter data to search:");
    scanf("%d",&data);
    for(i=0;i<size;i++)
    {
        if(a[i]==data)
        {
            p=1;
            break;
        }
    }
    if(p==0)
    {
        printf("data not found");
    }
    else
    {
        printf("data found");
    }
    return 0;
}
```

7.Create an array and delete any data from that array.

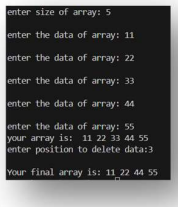
```c
#include<stdio.h>
int main()
{
    int size,i,a[' '],p,data,j;
    printf("enter size of array: ");
    scanf("%d",&size);
    for(i=0;i<=size-1;i++)
    {
        printf ("\nenter the data of array: ");
        scanf("%d",&a[i]);
    }
    printf("your array is: ");
    for(i=0;i<=size-1;i++)
    {
        printf("%3d",a[i]);
    }
    printf("\nenter data to search:");
    scanf("%d",&data);
    for(i=0;i<size;i++)
    {
        if(a[i]==data)
        {
            p=1;
            for(j=i+1;j<size;j++)
            {
                a[j-1]=a[j];

            }
        }
    }
    size--;
    if(p==0)
    {
        printf("data not found");
        size++;
    }
    else
    {
        printf("data found");
    }
    printf("\nYour final array is:");
    for(i=0;i<size;i++)
    {
        printf("%3d",a[i]);
    }
    return 0;
}
```

8.Create an array and delete data from any position of that array.

CODE:

```c
#include<stdio.h>
int main()
{
    int size,i,a[' '],p,data,j;
    printf("enter size of array: ");
    scanf("%d",&size);
    for(i=0;i<=size-1;i++)
    {
        printf ("\nenter the data of array: ");
        scanf("%d",&a[i]);
    }
    printf("your array is: ");
    for(i=0;i<=size-1;i++)
    {
        printf("%3d",a[i]);
    }
    printf("\nenter position to delete data:");
    scanf("%d",&p);
    for(i=p;i<=size-1;i++)
    {
        a[i-1]=a[i];
    }
    size--;
    printf("\nYour final array is:");
    for(i=0;i<size;i++)
    {
        printf("%3d",a[i]);
    }
    return 0;
}
```

RESULT:

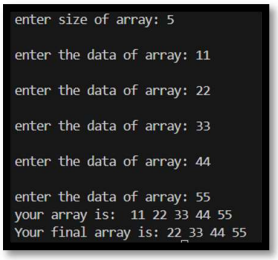


9.Create an array and delete data from 1st position of that array.

CODE:

```c
#include<stdio.h>
int main()
{
    int size,i,a[' '];
    printf("enter size of array: ");
    scanf("%d",&size);
    for(i=0;i<=size-1;i++)
    {
        printf ("\nenter the data of array: ");
        scanf("%d",&a[i]);
    }
    printf("your array is: ");
    for(i=0;i<=size-1;i++)
    {
        printf("%3d",a[i]);
    }
    for(i=1;i<=size-1;i++)
    {
        a[i-1]=a[i];
    }
    size--;
    printf("\nYour final array is:");
    for(i=0;i<size;i++)
    {
        printf("%3d",a[i]);
    }
    return 0;
}
```

RESULT:



10.Create an array and delete data from last position of that array.

CODE:

```c
#include<stdio.h>
int main()
{
    int size,i,a[' '];
    printf("enter size of array: ");
    scanf("%d",&size);
    for(i=0;i<=size-1;i++)
```

```
    {
        printf ("\nenter the data of array: ");
        scanf("%d",&a[i]);
    }
    printf("your array is: ");
  for(i=0;i<size;i++)
  {
    printf("%3d",a[i]);
  }
    size--;
    printf("\nYour final array is:");
    for(i=0;i<size;i++)
    {
        printf("%3d",a[i]);
    }
    return 0;
}
```

RESULT:

```
enter size of array: 5

enter the data of array: 11

enter the data of array: 22

enter the data of array: 33

enter the data of array: 44

enter the data of array: 55
your array is:  11 22 33 44 55
Your final array is: 11 22 33 44
```

11.Create an matrix using 2-D array

CODE:

```
#include<stdio.h>

int main()
{
    int a[' '][' '],r,c,i,j;
    printf("enter order of matrix:");
    scanf("%d%d",&r,&c);
    for(i=0;i<r;i++)
    {
    for(j=0;j<c;j++)
    {
    printf("\nenter data:");
    scanf("%d",&a[i][j]);
    }
    }
```

```
    printf("your matrix is: \n");
    for(i=0;i<r;i++)
    {
    for(j=0;j<c;j++)
    {
    printf("%3d",a[i][j]);
    }
    printf("\n");
    }
    return 0;
}
```

RESULT:

```
enter order of matrix:3 3

enter data:1

enter data:2

enter data:3

enter data:4

enter data:5

enter data:6

enter data:7

enter data:8

enter data:9
your matrix is:
  1  2  3
  4  5  6
  7  8  9
```

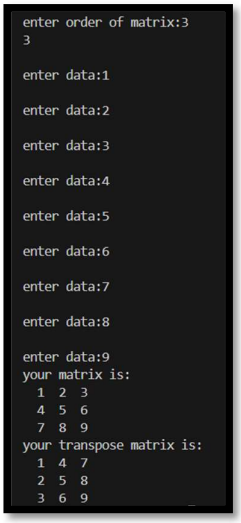
12.Create an matrix and its transpose matrix using 2-D array

CODE:

```
#include<stdio.h>

int main()
{
    int a[' '][' '],r,c,i,j;
    printf("enter order of matrix:");
    scanf("%d%d",&r,&c);
    for(i=0;i<r;i++)
    {
    for(j=0;j<c;j++)
    {
    printf("\nenter data:");
    scanf("%d",&a[i][j]);
```

```
    }
    }
    printf("your matrix is: \n");
    for(i=0;i<r;i++)
    {
    for(j=0;j<c;j++)
    {
    printf("%3d",a[i][j]);
    }
    printf("\n");
    }
    printf("your transpose matrix is: \n");
    for(j=0;j<c;j++)
    {
    for(i=0;i<r;i++)
    {
    printf("%3d",a[i][j]);
    }
    printf("\n");
    }
    return 0;
}
```

RESULT:



13.Write an code matrix addition using 2-D array

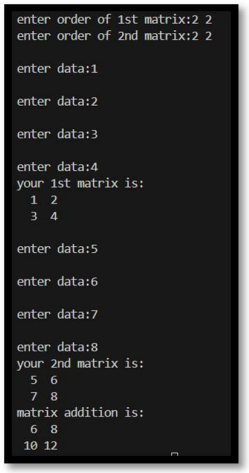
CODE:

```
#include<stdio.h>

int main()
{
    int a[' '][' '],r1,c1,i,j,r2,c2,b[' '][' '],c[' '][' '];
```

```
  printf("enter order of 1st matrix:");
  scanf("%d%d",&r1,&c1);
  printf("enter order of 2nd matrix:");
  scanf("%d%d",&r2,&c2);
  if(r1==r2 && c1==c2)
  {
  for(i=0; i<r1; i++)
  {
      for(j=0; j<c1; j++)
      {
          printf("\nenter data:");
          scanf("%d",&a[i][j]);
      }
  }
  printf("your 1st matrix is: \n");
  for(i=0; i<r1; i++)
  {
      for(j=0; j<c1; j++)
      {
          printf("%3d",a[i][j]);
      }
      printf("\n");
  }

  for(i=0; i<r2; i++)
  {
      for(j=0; j<c2; j++)
      {
          printf("\nenter data:");
          scanf("%d",&b[i][j]);
      }
  }
  printf("your 2nd matrix is: \n");
  for(i=0; i<r2; i++)
  {
      for(j=0; j<c2; j++)
      {
          printf("%3d",b[i][j]);
      }
      printf("\n");
  }
  printf("matrix addition is:\n");
for(i=0;i<r1;i++)
  {
  for(j=0;j<c1;j++)
  {
  c[i][j]=a[i][j]+b[i][j];
  printf("%3d",c[i][j]);
```

```
    }
    printf("\n");
    }
    }
      else
    {
    printf("order doesn't not satisfy the matrix addition");
    }
    return 0;
}
```

RESULT:



14.Write an code matrix substraction using 2-D array

CODE:

```
#include<stdio.h>

int main()
{
    int a[' '][' '],r1,c1,i,j,r2,c2,b[' '][' '],c[' '][' '];
    printf("enter order of 1st matrix:");
    scanf("%d%d",&r1,&c1);
    printf("enter order of 2nd matrix:");
    scanf("%d%d",&r2,&c2);
    if(r1==r2 && c1==c2)
    {
    for(i=0; i<r1; i++)
    {
        for(j=0; j<c1; j++)
        {
            printf("\nenter data:");
            scanf("%d",&a[i][j]);
        }
    }
```

```
    printf("your 1st matrix is: \n");
    for(i=0; i<r1; i++)
    {
        for(j=0; j<c1; j++)
        {
            printf("%3d",a[i][j]);
        }
        printf("\n");
    }

    for(i=0; i<r2; i++)
    {
        for(j=0; j<c2; j++)
        {
            printf("\nenter data:");
            scanf("%d",&b[i][j]);
        }
    }
    printf("your 2nd matrix is: \n");
    for(i=0; i<r2; i++)
    {
        for(j=0; j<c2; j++)
        {
            printf("%3d",b[i][j]);
        }
        printf("\n");
    }
    printf("matrix substraction of 2nd-1st matrix is:\n");
  for(i=0;i<r1;i++)
    {
    for(j=0;j<c1;j++)
    {
    c[i][j]=b[i][j]-a[i][j];
    printf("%3d",c[i][j]);
    }
    printf("\n");
    }
    }
      else
    {
    printf("order doesn't not satisfy the matrix addition");
    }
    return 0;
}
```

RESULT:

```
enter order of 1st matrix:2 2
enter order of 2nd matrix:2 2

enter data:5

enter data:3

enter data:6

enter data:4
your 1st matrix is:
  5  3
  6  4

enter data:5

enter data:3

enter data:8

enter data:7
your 2nd matrix is:
  5  3
  8  7
matrix substraction of 2nd-1st matrix is:
  0  0
  2  3
```

15.Write an code matrix multiplication using 2-D array

CODE:

```c
#include<stdio.h>

int main()
{
    int a[' '][' '],r1,c1,i,j,r2,c2,b[' '][' '],c[' '][' '],k;
    printf("enter order of 1st matrix:");
    scanf("%d%d",&r1,&c1);
    printf("enter order of 2nd matrix:");
    scanf("%d%d",&r2,&c2);
    if(c1==r2)
    {
        for(i=0; i<r1; i++)
        {
            for(j=0; j<c1; j++)
            {
                printf("\nenter data:");
                scanf("%d",&a[i][j]);
            }
        }
        printf("your 1st matrix is: \n");
        for(i=0; i<r1; i++)
        {
            for(j=0; j<c1; j++)
            {
                printf("%3d",a[i][j]);
            }
            printf("\n");
        }
```

```
        for(i=0; i<r2; i++)
        {
            for(j=0; j<c2; j++)
            {
                printf("\nenter data:");
                scanf("%d",&b[i][j]);
            }
        }
        printf("your 2nd matrix is: \n");
        for(i=0; i<r2; i++)
        {
            for(j=0; j<c2; j++)
            {
                printf("%3d",b[i][j]);
            }
            printf("\n");
        }
        printf("matrix multiplication is:\n");
        for(i=0; i<r1; i++)
        {
            for(j=0; j<c2; j++)
            {
            c[i][j]=0;
            for(k=0;k<c1;k++)
                c[i][j]=a[i][k]*b[k][j]+c[i][j];
                printf("%3d",c[i][j]);
            }
            printf("\n");
        }
    }
    else
    {
        printf("order doesn't not satisfy the matrix addition");
    }
    return 0;
}
```

```
enter order of 1st matrix:2 3
enter order of 2nd matrix:3 2

enter data:1

enter data:2

enter data:3

enter data:4

enter data:5

enter data:6
your 1st matrix is:
  1  2  3
  4  5  6

enter data:7

enter data:8

enter data:9

enter data:3

enter data:2

enter data:2
your 2nd matrix is:
  7  8
  9  3
  2  2
matrix multiplication is:
 31 20
 85 59
```

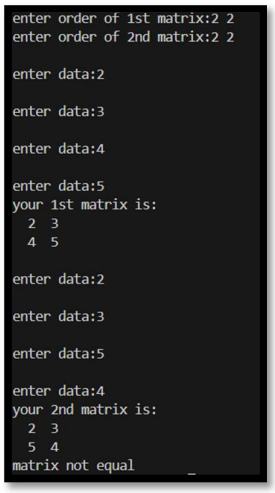
16.Write an code matrix equality check using 2-D array

CODE:

```
#include<stdio.h>

int main()
{
    int a[' '][' '],r1,c1,i,j,r2,c2,b[' '][' '],c[' '][' '],k,p=0;
    printf("enter order of 1st matrix:");
    scanf("%d%d",&r1,&c1);
    printf("enter order of 2nd matrix:");
    scanf("%d%d",&r2,&c2);
    {
        for(i=0; i<r1; i++)
        {
            for(j=0; j<c1; j++)
            {
                printf("\nenter data:");
                scanf("%d",&a[i][j]);
            }
        }
        printf("your 1st matrix is: \n");
        for(i=0; i<r1; i++)
        {
            for(j=0; j<c1; j++)
            {
                printf("%3d",a[i][j]);
            }
            printf("\n");
        }

        for(i=0; i<r2; i++)
        {
            for(j=0; j<c2; j++)
            {
                printf("\nenter data:");
                scanf("%d",&b[i][j]);
            }
        }
        printf("your 2nd matrix is: \n");
        for(i=0; i<r2; i++)
        {
            for(j=0; j<c2; j++)
            {
                printf("%3d",b[i][j]);
            }
            printf("\n");
        }
        for(i=0; i<r2; i++)
        {
```

```
            for(j=0; j<c2; j++)
            {
                if(a[i][j]!=b[i][j])
                {
                    p=1;
                    break;
                }
            }
        }
        if(p==0)
        {
            printf("matrix are equal");
        }
        else
        {
            printf("matrix not equal");
        }

        return 0;
    }
}
```

RESULT:



17. Write a code for identity matrix using 2-D array

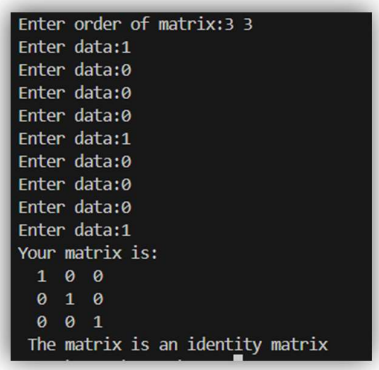
CODE:

```
#include<stdio.h>

int main()
{
    int a[' '][' '],r,c,i,j,p=1;
    printf("Enter order of matrix:");
    scanf("%d%d",&r,&c);
```

```
if(r==c)
{
    for(i=0; i<r; i++)
    {
        for(j=0; j<c; j++)
        {
            printf("Enter data:");
            scanf("%d",&a[i][j]);
        }
    }
    printf("Your matrix is: \n");
    for(i=0; i<r; i++)
    {
        for(j=0; j<c; j++)
        {
            printf("%3d",a[i][j]);
        }
        printf("\n");
    }

    for(i = 0; i < r; i++)
    {
        for(j = 0; j < c; j++)
        {
            if ((i == j && a[i][j] != 1) || (i != j && a[i][j] != 0))
            {
                p= 0;
                break;
            }
        }
        if (p == 0)
        {
            break;
        }
    }
    if(p== 1)
    {
        printf(" The matrix is an identity matrix\n");
    }
    else
    {
        printf(" The matrix is not an identity matrix\n");
    }
}
else
{
    printf("Not acceptable");
```

```
    }
    return 0;
}
```

RESULT:



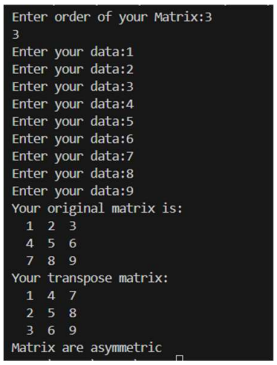
18. Write a code to check if a matrix is symmetric or asymmetric using 2-D array

CODE:

```
#include<stdio.h>

int main()
{
    int a[' '][' '],b[' '][' '],r,c,i,j,p;
    printf("Enter order of your Matrix:");
    scanf("%d%d",&r,&c);
    for (i=0; i<=r-1; i++)
    {
        for (j=0; j<=c-1; j++)
        {
            printf("Enter your data:");
            scanf("%d",&a[i][j]);
        }
    }
    printf("Your original matrix is:\n");
    for (i=0; i<=r-1; i++)
    {
        for (j=0; j<=c-1; j++)
        {
            printf("%3d",a[i][j]);
        }
        printf("\n");
    }
    for (i=0; i<=r-1; i++)
    {
```

```
        for (j=0; j<=c-1; j++)
        {
            b[j][i]=a[i][j];
        }
    }
    printf("Your transpose matrix: \n");
    for (i=0; i<=c-1; i++)
    {
        for (j=0; j<=r-1; j++)
        {
            printf("%3d",b[i][j]);
        }
        printf("\n");
    }
    for(i=0; i<c; i++)
    {
        for(j=0; j<r; j++)
        {
            if(a[i][j]!=b[i][j])
            {
                p=1;
                break;
            }
        }
    }
    if(p==0)
    {
        printf("Matrix are symmetric");
    }
    else
    {
        printf("Matrix are asymmetric");
    }
    return 0;
}
```

RESULT:



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B.SC IN COMPUTER SCIENCE

Now I am a 1st year student .

My linkdIn profile link: https://www.linkedin.com/in/kumar-roy-1422022a6 for more pdf.☺✓

01/05/24