

C Programming

(Problem & Solution)

- Md Ashraf-ul Asad

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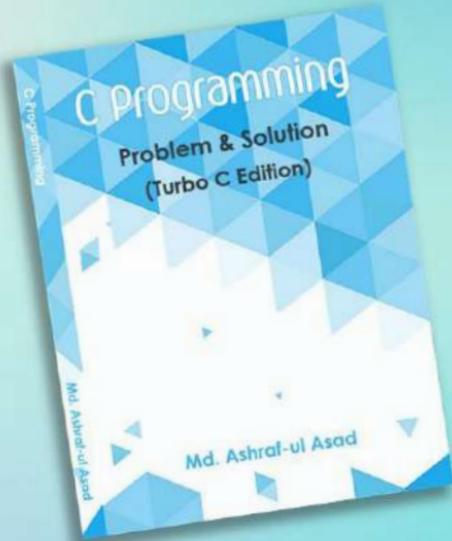
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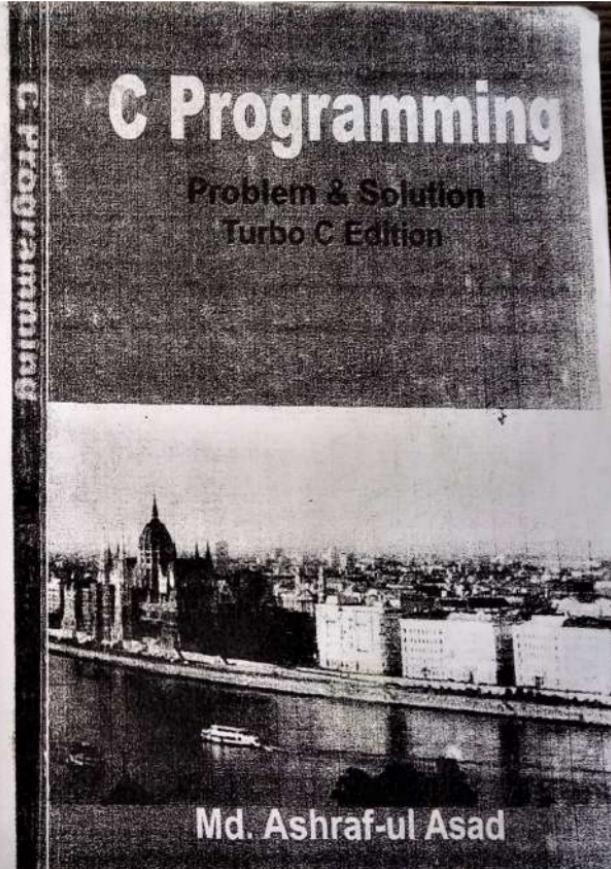




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C Programming

(Problem & Solution)
(Turbo C Edition)

Md. Ashraf-ul Asad

Dept. of Computer Science &
Engineering
University of Rajshahi
Mobile: 01716884504
E-mail: acm_ashraf@yahoo.com



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string.	Ashraf
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1. Input Output

1.1. Write a program that prints your name.

```
#include<stdio.h>
#include<conio.h>

void main()
{
    clrscr();
    printf("Ashraf");
    getch();
}
```

1.2. An integer variable n contains 5. Write a program that print the value of n.

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int n;

    clrscr();
    n=5;
    printf("%d", n);
    getch();
}
```

1.3. Write a program that read and display an integer number.

```
#include<stdio.h>
#include<conio.h>
```

```
void main()
{
    int n;

    clrscr();
    scanf("%d", &n);
    printf("%d", n);
    getch();
}
```

1.4. Write a program that read and display an integer number.

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int n;

    clrscr();
    printf("Enter any integer number: ");
    scanf("%d", &n);

    printf("%d", n);
    getch();
}
```

1.5. Write a program that read and display floating point number.

```
#include<stdio.h>
#include<conio.h>

void main()
{
    float n;

    clrscr();
```

```

printf("Enter any floating point number: ");
scanf("%f",&n);
printf("%f",n);
getch();
}

```

1.6. Write a program that read and display long number.

```

#include<stdio.h>
#include<conio.h>

void main()
{
    long n;

    clrscr();
    printf("Enter any long number: ");
    scanf("%ld",&n);

    printf("%ld",n);
    getch();
}

```

1.7. Write a program that read and display double number.

```

#include<stdio.h>
#include<conio.h>

void main()
{
    double n;

    clrscr();
    printf("Enter any double number: ");
    scanf("%lf",&n);

    printf("%lf",n);
    getch();
}

```

1.8. Write a program that read and display any character.

```

#include<stdio.h>
#include<conio.h>

void main()
{
    char n;

    clrscr();
    printf("Enter any character: ");
    scanf("%c",&n);

    printf("%c",n);
    getch();
}

```

1.9. Write a program that read ASCII value and display equivalent character.

```

#include<stdio.h>
#include<conio.h>

void main()
{
    char n;

    clrscr();
    printf("Enter any ASCII value: ");
    scanf("%d",&n);

    printf("%c",n);
    getch();
}

```

1.10. Write a program that read any character and display ASCII value.

```
#include<stdio.h>
#include<conio.h>

void main()
{
    char n;

    clrscr();
    printf("Enter any character: ");
    scanf("%c", &n);

    printf("%d", n);
    getch();
}
```

1.11. Write a program that read any lower case character and display in upper case.

```
#include<stdio.h>
#include<conio.h>

void main()
{
    char n;

    clrscr();
    printf("Enter any lower case character: ");
    scanf("%c", &n);

    printf("%c", n+32);
    getch();
}
```

1.12. Write a program that read any upper case character and display in lower case.

```
#include<stdio.h>
#include<conio.h>

void main()
{
    char n;

    clrscr();
    printf("Enter any upper case character: ");
    scanf("%c", &n);

    printf("%c", n-32);
    getch();
}
```

1.13. Write a program that read any decimal number and display equivalent octal number.

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int n;

    clrscr();
    printf("Enter any decimal number: ");
    scanf("%d", &n);

    printf("Equivalent octal number is %o.", n);
    getch();
}
```

- 1.14. Write a program that read any decimal number and display equivalent hexadecimal number.

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int n;

    clrscr();
    printf("Enter any decimal number: ");
    scanf("%d",&n);

    printf("Equivalent hexadecimal number is
%X.",n);
    getch();
}
```

- 1.15. Write a program that read any decimal number and display equivalent hexadecimal number.

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int n;

    clrscr();
    printf("Enter any decimal number: ");
    scanf("%d",&n);

    printf("Equivalent hexadecimal number is
%X.",n);
    getch();
}
```

- 1.16. Write a program that read any octal number and display equivalent decimal number.

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int n;

    clrscr();
    printf("Enter any octal number: ");
    scanf("%o",&n);

    printf("Equivalent decimal number is %d.",n);
    getch();
}
```

- 1.17. Write a program that read any hexadecimal number and display equivalent decimal number.

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int n;

    clrscr();
    printf("Enter any hexadecimal number: ");
    scanf("%x",&n);

    printf("Equivalent decimal number is %d.",n);
    getch();
}
```

1.18. Write a program that read and display your name.

```
#include<stdio.h>
#include<conio.h>

void main()
{
    char st[30];

    clrscr();
    printf("Enter your name: ");
    scanf("%s",st);

    printf("Your name is %s.",st);
    getch();
}
```

1.19. Write a program that read and display a line of text.

```
#include<stdio.h>
#include<conio.h>

void main()
{
    char st[100];

    clrscr();
    printf("Enter any line of text: ");
    gets(st);

    printf("%s",st);
    getch();
}
```

1.20. Write a program that read any date in the format DD/MM/YYYY and displays day, month and year separately.

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int d,m,y;

    clrscr();
    printf("Enter any date in format(DD/MM/YYYY):");
    scanf("%d/%d/%d",&d,&m,&y);

    printf("\nDay= %d\nMonth= %d\nYear= %d",d,m,y);
    getch();
}
```

1.21. Write a program that read any date in the format DD-MM-YYYY and display day, month and year separately.

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int d,m,y;

    clrscr();
    printf("Enter any date in format(DD-MM-YYYY):");
    scanf("%d-%d-%d",&d,&m,&y);

    printf("\nDay= %d\nMonth= %d\nYear= %d",d,m,y);
    getch();
}
```

1.22. Write a program that read any date in the entire following format

- i) DD-MM-YYYY
- ii) DD/MM/YYYY
- iii) DD MM YYYY
- iv) DD,MM,YYYY

and displays day, month and year separately.

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int d,m,y;

    clrscr();
    printf("Enter any date(DD MM YYYY): ");
    scanf("%d%c%d%c%d", &d, &m, &y);

    printf("\nDay= %d\nMonth= %d\nYear= %d", d, m, y);
    getch();
}
```

2. Operator

2.1. Write a program that read two integer and display sum.

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int a,b;

    clrscr();
    printf("a= ");
    scanf("%d", &a);
    printf("b= ");
    scanf("%d", &b);

    printf("Sum= %d", a+b);
    getch();
}
```

2.2. Write a program that subtracts two integers.

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int a,b;

    clrscr();
    printf("a= ");
    scanf("%d", &a);
    printf("b= ");
    scanf("%d", &b);

    printf("Subtraction= %d", a-b);
}
```

```
    getch();
}
```

2.3. Write a program that read two integer and display product.

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int a,b;

    clrscr();
    printf("a= ");
    scanf("%d",&a);
    printf("b= ");
    scanf("%d",&b);

    printf("Product= %d",a*b);
    getch();
}
```

2.4. Write a program that divide two integer.

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int a,b;

    clrscr();
    printf("a= ");
    scanf("%d",&a);
    printf("b= ");
    scanf("%d",&b);

    printf("Division= %d",a/b);
    getch();
}
```

2.5. Write a program that read and divide two floating point numbers.

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int a,b;

    clrscr();
    printf("a= ");
    scanf("%f",&a);
    printf("b= ");
    scanf("%f",&b);

    printf("Division= %f", (float)a/b);
    getch();
}
```

2.6. Write a program that read two integer and display remainder.

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int a,b;

    clrscr();
    printf("a= ");
    scanf("%d",&a);
    printf("b= ");
    scanf("%d",&b);

    printf("Mod= %d",a%b);
    getch();
}
```

2.7. Write a program that read radius of a circle and display area.

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int r;
    float area;

    clrscr();
    printf("Radius: ");
    scanf("%d",&r);

    area=3.142*r*r;

    printf("Area= %f",area);
    getch();
}
```

2.8. Write a program that read radius of a circle and display area.

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int r;
    float area,pi=3.142;

    clrscr();
    printf("Radius: ");
    scanf("%d",&r);

    area=pi*r*r;
```

```
    printf("Area= %f",area);
    getch();
}
```

2.9. Write a program that read radius of a circle and display area.

```
#include<stdio.h>
#include<conio.h>

#define pi 3.142

void main()
{
    int r;
    float area;

    clrscr();
    printf("Radius: ");
    scanf("%d",&r);

    area=pi*r*r;

    printf("Area= %f",area);
    getch();
}
```

2.10. Write a program that read radius of a circle and display area.

```
#include<stdio.h>
#include<conio.h>
#include<math.h>

void main()
{
    int r;
    float area;

    clrscr();
```

```

printf("Radius: ");
scanf("%d",&r);

area=M_PI*r*r;

printf("Area= %f",area);
getch();
}

```

2.11. Write a program that read temperature in Celsius and display in Fahrenheit.

```

#include<stdio.h>
#include<conio.h>

void main()
{
    float c,f;

    clrscr();
    printf("C= ");
    scanf("%f",&c);

    f=(float)9/5*c+32;

    printf("F= %f",f);
    getch();
}

```

2.12. Write a program that read temperature in Fahrenheit and display in Celsius.

```

#include<stdio.h>
#include<conio.h>

void main()
{
    float c,f;

```

```

clrscr();
printf("F= ");
scanf("%f",&f);

c=(float)5/9*(f-32);

printf("C= %f",c);
getch();
}

```

2.13. Write a program that read two numbers and display bitwise AND.

```

#include<stdio.h>
#include<conio.h>

void main()
{
    int a,b,c;

    clrscr();
    printf("a= ");
    scanf("%d",&a);
    printf("b= ");
    scanf("%d",&b);

    c=a&b;

    printf("%d & %d = %d",a,b,c);
    getch();
}

```

2.14. Write a program that read two numbers and display bitwise OR.

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int a,b,c;

    clrscr();
    printf("a= ");
    scanf("%d",&a);
    printf("b= ");
    scanf("%d",&b);

    c=a|b;

    printf("%d | %d = %d",a,b,c);
    getch();
}
```

2.15. Write a program that read two numbers and display bitwise Exclusive OR.

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int a,b,c;

    clrscr();
    printf("a= ");
    scanf("%d",&a);
    printf("b= ");
    scanf("%d",&b);

    c=a^b;

    printf("%d ^ %d = %d",a,b,c);
    getch();
}
```

2.16. Write a program that read a number and divide by two using shift operator.

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int n;

    clrscr();
    printf("n= ");
    scanf("%d",&n);

    n=(n>>1);

    printf("%d",n);
    getch();
}
```

2.17. Write a program that read a number and multiply by two using shift operator.

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int n;

    clrscr();
    printf("n= ");
    scanf("%d",&n);

    n=(n<<1);

    printf("%d",n);
    getch();
}
```

2.18. Write a program that read a number and multiply by five using shift operator.

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int n;

    clrscr();
    printf("n= ");
    scanf("%d", &n);

    n=(n<<2)+n;
    printf("%d", n);
    getch();
}
```

2.19. Write a program that read a number and mod by 4 using bitwise AND.

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int n;

    clrscr();
    printf("n= ");
    scanf("%d", &n);

    printf("%d", n&3);
    getch();
}
```

2.20. Write a program that read a number and mod by 8 using bitwise AND.

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int n;

    clrscr();
    printf("n= ");
    scanf("%d", &n);

    printf("%d", n&7);
    getch();
}
```

3. Math.h

3.1. Write a program that read any integer number and display absolute value.

```
#include<stdio.h>
#include<conio.h>
#include<math.h>

void main()
{
    int n;

    clrscr();
    printf("Enter any integer: ");
    scanf("%d",&n);

    printf("abs(%d)= %d",n, abs(n));
    getch();
}
```

3.2. Write a program that read any angle t and display sin(t).

```
#include<stdio.h>
#include<conio.h>
#include<math.h>

void main()
{
    int t;

    clrscr();
    printf("Enter any angle: ");
    scanf("%d",&t);

    printf("Sin(%d)= %.2f",t,sin(t*M_PI/180));
    getch();
}
```

3.3. Write a program that read any angle t and display cos(t).

```
#include<stdio.h>
#include<conio.h>
#include<math.h>

void main()
{
    int t;

    clrscr();
    printf("Enter any angle: ");
    scanf("%d",&t);

    printf("Cos(%d)= %.2f",t,cos(t*M_PI/180));
    getch();
}
```

3.4. Write a program that read any angle t and display tan(t).

```
#include<stdio.h>
#include<conio.h>
#include<math.h>

void main()
{
    int t;

    clrscr();
    printf("Enter any angle: ");
    scanf("%d",&t);

    printf("Tan(%d)= %.2f",t,tan(t*M_PI/180));
    getch();
}
```

3.5. Write a program that read any angle t and display cot(t).

```
#include<stdio.h>
#include<conio.h>
#include<math.h>

void main()
{
    int t;

    clrscr();
    printf("Enter any angle: ");
    scanf("%d",&t);

    printf("Cot(%d) = %.2f",t,1/tan(t*M_PI/180));
    getch();
}
```

3.6. Write a program that read any angle t and display sec(t).

```
#include<stdio.h>
#include<conio.h>
#include<math.h>

void main()
{
    int t;

    clrscr();
    printf("Enter any angle: ");
    scanf("%d",&t);

    printf("Sec(%d) = %.2f",t,1/cos(t*M_PI/180));
    getch();
}
```

3.7. Write a program that read any angle t and display cosec(t).

```
#include<stdio.h>
#include<conio.h>
#include<math.h>

void main()
{
    int t;

    clrscr();
    printf("Enter any angle: ");
    scanf("%d",&t);

    printf("Cosec(%d) = %.2f",t,1/sin(t*M_PI/180));
    getch();
}
```

3.8. Write a program that read a value n and display sin inverse(n).

```
#include<stdio.h>
#include<conio.h>
#include<math.h>

void main()
{
    float n;

    clrscr();
    printf("Enter any value: ");
    scanf("%f",&n);

    printf("Sin inverse(%.2f) =\n%.2f",n,asin(n)*180/M_PI);
    getch();
}
```

3.9. Write a program that read a value n and display cos inverse(n).

```
#include<stdio.h>
#include<conio.h>
#include<math.h>

void main()
{
    float n;

    clrscr();
    printf("Enter any value: ");
    scanf("%f",&n);

    printf("Cos inverse(%.2f)=
%.2f",n,acos(n)*180/M_PI);
    getch();
}
```

3.10. Write a program that read a value n and display tan inverse(n).

```
#include<stdio.h>
#include<conio.h>
#include<math.h>

void main()
{
    float n;

    clrscr();
    printf("Enter any value: ");
    scanf("%f",&n);

    printf("Tan inverse(%.2f)=
%.2f",n,atan(n)*180/M_PI);
    getch();
}
```

3.11. Write a program that read a value n and display cot inverse(n).

```
#include<stdio.h>
#include<conio.h>
#include<math.h>

void main()
{
    float n;

    clrscr();
    printf("Enter any value: ");
    scanf("%f",&n);

    printf("Cot inverse(%.2f)=
%.2f",n,atan(1.0/n)*180/M_PI);
    getch();
}
```

3.12. Write a program that read a value n and display sec inverse(n).

```
#include<stdio.h>
#include<conio.h>
#include<math.h>

void main()
{
    float n;

    clrscr();
    printf("Enter any value: ");
    scanf("%f",&n);

    printf("Sec inverse(%.2f)=
%.2f",n,acos(1.0/n)*180/M_PI);
    getch();
}
```

3.13. Write a program that read a value n and display cosec inverse(n).

```
#include<stdio.h>
#include<conio.h>
#include<math.h>

void main()
{
    float n;

    clrscr();
    printf("Enter any value: ");
    scanf("%f",&n);

    printf("Cosec inverse(%.2f)=
%.2f",n,asin(1.0/n)*180/M_PI);
    getch();
}
```

3.14. Write a program that read two numbers(x,y) and display the value of x^y .

```
#include<stdio.h>
#include<conio.h>
#include<math.h>

void main()
{
    int x,y;

    clrscr();
    printf("x= ");
    scanf("%d",&x);
    printf("y= ");
    scanf("%d",&y);

    printf("%d to the power %d=
%.0lf",x,y,pow(x,y));
    getch();
}
```

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3.15. Write a program that read any numbers and display its square root.

```
#include<stdio.h>
#include<conio.h>
#include<math.h>

void main()
{
    long n;

    clrscr();
    printf("Enter any number: ");
    scanf("%ld",&n);

    printf("Square root of %ld=
%ld",n,(long)sqrt(n));
    getch();
}
```

3.16. Write a program that read any number x and display e to the power x.

```
#include<stdio.h>
#include<conio.h>
#include<math.h>

void main()
{
    float x;

    clrscr();
    printf("Enter any number: ");
    scanf("%f",&x);

    printf("e to the power %.2f= %.2lf",x,exp(x));
    getch();
}
```

3.17. Write a program that read any number x and display $\log(x)$.

```
#include<stdio.h>
#include<conio.h>
#include<math.h>

void main()
{
    double x;

    clrscr();
    printf("x= ");
    scanf("%lf",&x);

    printf("log(%lf) = %.2lf",x,log(x));
    getch();
}
```

3.18. Write a program that read any number x and display $\log_{10}(x)$.

```
#include<stdio.h>
#include<conio.h>
#include<math.h>

void main()
{
    double x;

    clrscr();
    printf("x= ");
    scanf("%lf",&x);

    printf("log10(%lf) = %.2lf",x,log10(x));
    getch();
}
```

4. If, If ... else

4.1. Write a program that read an integer and print odd or even.

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int n;

    clrscr();
    printf("Enter any number: ");
    scanf("%d",&n);

    if (n%2==0)
        printf("Even number.");
    else
        printf("Odd number.");
    getch();
}
```

4.2. Write a program that read two numbers and display maximum.

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int a,b,max;

    clrscr();
    printf("a= ");
    scanf("%d",&a);
    printf("b= ");
    scanf("%d",&b);
```

```

if (a>b)
max=a;
else
max=b;

printf("Maximum= %d",max);
getch();
}

```

4.3. Write a program that read two numbers and display maximum.

```

#include<stdio.h>
#include<conio.h>

void main()
{
    int a,b;

    clrscr();
    printf("a= ");
    scanf("%d",&a);
    printf("b= ");
    scanf("%d",&b);

    if (a>b)
    printf("Maximum= %d",a);
    else
    printf("Maximum= %d",b);

    getch();
}

```

4.4. Write a program that read two numbers and display minimum.

```

#include<stdio.h>
#include<conio.h>

void main()

```

```

int a,b,min;

clrscr();
printf("a= ");
scanf("%d",&a);
printf("b= ");
scanf("%d",&b);

if (a<b)
min=a;
else
min=b;

printf("Minimum= %d",min);
getch();
}

```

4.5. Write a program that read two numbers and display minimum.

```

#include<stdio.h>
#include<conio.h>

void main()
{
    int a,b;

    clrscr();
    printf("a= ");
    scanf("%d",&a);
    printf("b= ");
    scanf("%d",&b);

    if (a<b)
    printf("Minimum= %d",a);
    else
    printf("Minimum= %d",b);

    getch();
}

```

4.6. Write a program that read three numbers and display maximum.

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int a,b,c,max;

    clrscr();
    printf("a= ");
    scanf("%d",&a);
    printf("b= ");
    scanf("%d",&b);
    printf("c= ");
    scanf("%d",&c);

    if (a>b)
    {
        if (a>c)
            max=a;
        else
            max=c;
    }
    else
    {
        if (b>c)
            max=b;
        else
            max=c;
    }

    printf("Maximum= %d",max);
    getch();
}
```

4.7. Write a program that read three numbers and display minimum.

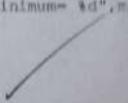
```
#include<stdio.h>
#include<conio.h>

void main()
{
    int a,b,c,min;

    clrscr();
    printf("a= ");
    scanf("%d",&a);
    printf("b= ");
    scanf("%d",&b);
    printf("c= ");
    scanf("%d",&c);

    if (a<b)
    {
        if (a<c)
            min=a;
        else
            min=c;
    }
    else
    {
        if (b<c)
            min=b;
        else
            min=c;
    }

    printf("Minimum= %d",min);
    getch();
}
```



4.8. Write a program that read three numbers and display medium.

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int a,b,c,mid;

    clrscr();
    printf("a= ");
    scanf("%d",&a);
    printf("b= ");
    scanf("%d",&b);
    printf("c= ");
    scanf("%d",&c);

    if (a>b)
    {
        if (a>c)          // a>b a>c
        {
            if (b>c)    // a>b a>c b>c
                mid=b;
            else
                mid=c;
        }
        else           // a>b c>a
        mid=a;
    }
    else           // b>a
    {
        if (b>c)
        {
            if (a>c)
                mid=a;
            else
                mid=c;
        }
        else           // b>a c>b
        mid=b;
    }
}
```

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```
)
printf("Midium= %d",mid);
getch();
}
```

4.9. Write a program that read mark and display pass or fail.

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int mark;

    clrscr();
    printf("Mark= ");
    scanf("%d",&mark);

    if (mark>=33)
        printf("Pass");
    else
        printf("Fail");
    getch();
}
```

4.10. Write a program that read mark and display result in division.

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int mark;

    clrscr();
    printf("Mark= ");
    scanf("%d",&mark);

    if (mark>=60)

```

```

printf("First division.");
else if (mark>=45)
printf("Second division.");
else if (mark>=33)
printf("Third division.");
else
printf("Fail");
getch();
}

```

4.11. Write a program that read mark and display result in grade.

```

#include<stdio.h>
#include<conio.h>

void main()
{
    int mark;

    clrscr();
    printf("Mark= ");
    scanf("%d",&mark);

    if (mark>=80)
    printf("A+");
    else if (mark>=70)
    printf("A");
    else if (mark>=60)
    printf("A-");
    else if (mark>=50)
    printf("B");
    else if (mark>=40)
    printf("C");
    else if (mark>=33)
    printf("D");
    else
    printf("F");
    getch();
}

```

4.12. Write a program that read any year and display leap year or not leap year.

```

#include<stdio.h>
#include<conio.h>

void main()
{
    int year;

    clrscr();
    printf("Enter any year: ");
    scanf("%d",&year);

    if (year%4!=0)
    printf("Not leap year.");
    else if ((year%100!=0)
    printf("Leap year.");
    else if (year%400!=0)
    printf("Not leap year.");
    else
    printf("Leap year.");

    getch();
}

```

(Y1, Y2, ..., Yn) N (Y1, Y2, ..., Yn)

leap year
not leap year

4.13. Write a program that read three numbers(a,b,c) and determine the roots of the quadratic equation:

$$ax^2+bx+c=0$$

```

#include<stdio.h>
#include<conio.h>
#include<math.h>

void main()
{
    int a,b,c,d;
    float x1,x2,p,q;

```

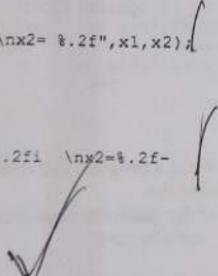
```

clrscr();
printf("a= ");
scanf("%d",&a);
printf("b= ");
scanf("%d",&b);
printf("c= ");
scanf("%d",&c);
d=b*b-4*a*c;

if (d>0)
{
    x1=(-b+sqrt(d))/(2*a);
    x2=(-b-sqrt(d))/(2*a);
    printf("\nx1= %.2f\nx2= %.2f",x1,x2);
}
else if (d==0)
{
    x1=x2=-b/(2*a);
    printf("\nx1= %.2f\nx2= %.2f",x1,x2);
}
else
{
    p=-b/(2*a);
    q=sqrt(-d)/(2*a);
    printf("\nx1=%.2f+.2fi \nx2=%.2f-%.2fi",p,q,p,q);
}

getch();

```



5. Conditional Operator

5.1. Write a program that read an integer and print odd or even.

```

#include<stdio.h>
#include<conio.h>

void main()
{
    int n;

    clrscr();
    printf("Enter any number: ");
    scanf("%d",&n);

    printf("%s", (n%2==0) ? "Even number.": "Odd number.");
    getch();
}

```

5.2. Write a program that read two numbers and display maximum.

```

#include<stdio.h>
#include<conio.h>

void main()
{
    int a,b,max;

    clrscr();
    printf("a= ");
    scanf("%d",&a);
    printf("b= ");
    scanf("%d",&b);

    max=(a>b) ? a:b;
}

```

```

printf("Maximum= %d",max);
getch();
}

```

5.3. Write a program that read two numbers and display maximum.

```

#include<stdio.h>
#include<conio.h>

void main()
{
    int a,b;

    clrscr();
    printf("a= ");
    scanf("%d", &a);
    printf("b= ");
    scanf("%d", &b);

    printf("Maximum= %d", (a>b) ? a:b);

    getch();
}

```

5.4. Write a program that read two numbers and display minimum.

```

#include<stdio.h>
#include<conio.h>

void main()

{
    int a,b,min;

    clrscr();
    printf("a= ");

```

```

scanf("%d", &a);
printf("b= ");
scanf("%d", &b);

min=(a<b) ? a:b;

printf("Minimum= %d", min);
getch();
}

```

5.5. Write a program that read two numbers and display minimum.

```

#include<stdio.h>
#include<conio.h>

void main()
{
    int a,b;

    clrscr();
    printf("a= ");
    scanf("%d", &a);
    printf("b= ");
    scanf("%d", &b);

    printf("Minimum= %d", (a<b) ? a:b);

    getch();
}

```

5.6. Write a program that read three numbers and display maximum.

```

#include<stdio.h>
#include<conio.h>

void main()
{

```

```

int a,b,c,max;
clrscr();
printf("a= ");
scanf("%d",&a);
printf("b= ");
scanf("%d",&b);
printf("c= ");
scanf("%d",&c);

max=(a>b)? (a>c)? a:c:(b>c)? b:c;
printf("Maximum= %d",max);
getch();
}

```

5.7. Write a program that read three numbers and display minimum.

```

#include<stdio.h>
#include<conio.h>

void main()
{
    int a,b,c,min;

    clrscr();
    printf("a= ");
    scanf("%d",&a);
    printf("b= ");
    scanf("%d",&b);
    printf("c= ");
    scanf("%d",&c);

    min=(a<b)? (a<c)? a:c: (b<c)? b:c;
    printf("Minimum= %d",min);
    getch();
}

```

5.8. Write a program that read three numbers and display medium.

```

#include<stdio.h>
#include<conio.h>

void main()
{
    int a,b,c,mid;

    clrscr();
    printf("a= ");
    scanf("%d",&a);
    printf("b= ");
    scanf("%d",&b);
    printf("c= ");
    scanf("%d",&c);

    mid=(a+b)? (a>c)? (b>c)? b:c:a:(b>c)? (a>c)? a:c:b;
    printf("Midium= %d",mid);
    getch();
}

```

5.9. Write a program that read mark and display pass or fail.

```

#include<stdio.h>
#include<conio.h>

void main()
{
    int mark;

    clrscr();
    printf("Mark= ");
    scanf("%d",&mark);

    printf("%s", (mark>=33) ? "Pass":"Fail");
    getch();
}

```

6. Switch

6.1. Write a program that read a digit and display by spelling.

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int n;

    clrscr();
    printf("Enter any digit: ");
    scanf("%d",&n);

    switch(n)
    {
        case 0:
            printf("Zero");
            break;
        case 1:
            printf("One");
            break;
        case 2:
            printf("Two");
            break;
        case 3:
            printf("Three");
            break;
        case 4:
            printf("Four");
            break;
        case 5:
            printf("Five");
            break;
        case 6:
            printf("Six");
            break;
        case 7:
            printf("Seven");
            break;
    }
}
```

```
case 8:
    printf("Eight");
    break;
case 9:
    printf("Nine");
    break;
default:
    printf("Not a single digit.");
}
getch();
```

6.2. Write a program that read any number and equivalent roman number.

```
void main()
{
    int n,h,s,d,a,i;

    clrscr();
    printf("Enter any number: ");
    scanf("%d",&n);

    printf("Equivalent Roman number is: ");
    h=n/1000;

    for (i=1; i<=h; i++)
        printf("M");

    s=(n%1000)/100;
    switch(s)
    {
        case 1:
            printf("C");
            break;
        case 2:
            printf("CC");
            break;
        case 3:
            printf("CCC");
            break;
    }
}
```

```

case 4:
    printf("CD");
    break;
case 5:
    printf("D");
    break;
case 6:
    printf("DC");
    break;
case 7:
    printf("DCC");
    break;
case 8:
    printf("DCCC");
    break;
case 9:
    printf("CM");
    break;
}

d=(n%100)/10;
switch(d)
{
case 1:
    printf("X");
    break;
case 2:
    printf("XX");
    break;
case 3:
    printf("XXX");
    break;
case 4:
    printf("XL");
    break;
case 5:
    printf("L");
    break;
case 6:
    printf("LX");
    break;
case 7:
}

```

```

printf("LXX");
break;
case 8:
    printf("LXXX");
    break;
case 9:
    printf("XC");
    break;
}

a=n%10;
switch(a)
{
case 3:
    printf("I");
case 2:
    printf("I");
case 1:
    printf("I");
    break;
case 4:
    printf("IV");
    break;
case 5:
    printf("V");
    break;
case 6:
    printf("VI");
    break;
case 7:
    printf("VII");
    break;
case 8:
    printf("VIII");
    break;
case 9:
    printf("IX");
    break;
}
getch();
}

```

7. Series

7.1. 1+2+3+4+..... upto n'th term.

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int i,n,sum=0;

    clrscr();
    printf("How many number: ");
    scanf("%d",&n);

    for (i=1; i<=n; i++)
        sum=sum+i;

    printf("Sum= %d",sum);
    getch();
}
```

7.2. 2+4+6+8+..... upto n'th term.

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int i,n,sum=0;

    clrscr();
    printf("How many number: ");
    scanf("%d",&n);

    for (i=1; i<=n; i++)
        sum=sum+(2*i);
}
```

```
    sum=sum+2*i;

    printf("Sum= %d",sum);
    getch();
}
```

7.3. 1+3+5+7+..... upto n'th term.

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int i,n,sum=0;

    clrscr();
    printf("How many number: ");
    scanf("%d",&n);

    for (i=1; i<=n; i++)
        sum=sum+2*i-1;

    printf("Sum= %d",sum);
    getch();
}
```

7.4. 4+12+20+28+..... upto n'th term.

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int i,n,sum=0;

    clrscr();
    printf("How many number: ");
    scanf("%d",&n);
}
```

```

for (i=1; i<=n; i++)
sum=sum+8*i-4;

printf("Sum= %d",sum);
getch();
}

```

7.5. $2+5+8+11+\dots$ upto n'th term.

```

#include<stdio.h>
#include<conio.h>

void main()
{
    int i,n,sum=0;

    clrscr();
    printf("How many number: ");
    scanf("%d",&n);

    for (i=1; i<=n; i++)
    sum=sum+3*i-1;

    printf("Sum= %d",sum);
    getch();
}

```

7.6. $1.2+2.3+3.4+\dots$ upto n'th term.

```

#include<stdio.h>
#include<conio.h>

void main()
{
    int i,n,sum=0;

    clrscr();
    printf("How many number: ");
    scanf("%d",&n);
}

```

```

for (i=1; i<=n; i++)
sum=sum+i*(i+1);

printf("Sum= %d",sum);
getch();
}

```

7.7. $2.1+5.3+8.5+\dots$ upto n'th term.

```

#include<stdio.h>
#include<conio.h>

void main()
{
    int i,n,sum=0;

    clrscr();
    printf("How many number: ");
    scanf("%d",&n);

    for (i=1; i<=n; i++)
    sum=sum+(3*i-1)*(2*i-1);

    printf("Sum= %d",sum);
    getch();
}

```

7.8. $1.3+3.5+5.7+\dots$ upto n'th term.

```

#include<stdio.h>
#include<conio.h>

void main()
{
    int i,n,sum=0;

    clrscr();
}

```

```

printf("How many number: ");
scanf("%d", &n);

for (i=1; i<=n; i++)
sum=sum+(2*i-1)*(2*i+1);

printf("Sum= %d", sum);
getch();
}

```

7.9. $1^2 + 3^2 + 5^2 + \dots$ upto n'th term.

```

#include<stdio.h>
#include<conio.h>

void main()
{
    int i,n,sum=0;

    clrscr();
    printf("How many number: ");
    scanf("%d", &n);

    for (i=1; i<=n; i++)
    sum=sum+(2*i-1)*(2*i-1);

    printf("Sum= %d", sum);
    getch();
}

```

7.10. $1.1^2 + 2.3^2 + 3.5^2 + \dots$ upto n'th term.

```

#include<stdio.h>
#include<conio.h>

void main()
{

```

```

int i,n,sum=0;

clrscr();
printf("How many number: ");
scanf("%d", &n);

for (i=1; i<=n; i++)
sum=sum+i*(2*i-1)*(2*i-1);

printf("Sum= %d", sum);
getch();
}

```

7.11. $1.2^2 + 2.3^2 + 3.4^2 + \dots$ upto n'th term.

```

#include<stdio.h>
#include<conio.h>

void main()
{
    int i,n,sum=0;

    clrscr();
    printf("How many number: ");
    scanf("%d", &n);

    for (i=1; i<=n; i++)
    sum=sum+i*(i+1)*(i+1);

    printf("Sum= %d", sum);
    getch();
}

```

7.12. $1^2.2^2 + 2^2.3^2 + 3^2.4^2 + \dots$ upto n'th term.

```

#include<stdio.h>
#include<conio.h>

void main()
{

```

```

{
    int i,n,sum=0;

    clrscr();
    printf("How many number: ");
    scanf("%d",&n);

    for (i=1; i<=n; i++)
        sum=sum+i*(i+1)*(i+1);

    printf("Sum= %d",sum);
    getch();
}

```

7.13. $1.2.3+2.3.4+3.4.5+\dots$ upto n'th term.

```

#include<stdio.h>
#include<conio.h>

void main()
{
    int i,n,sum=0;

    clrscr();
    printf("How many number: ");
    scanf("%d",&n);

    for (i=1; i<=n; i++)
        sum=sum+i*(i+1)*(i+2);

    printf("Sum= %d",sum);
    getch();
}

```

7.14. $1.3.5.7+3.5.7.9+5.7.9.11+\dots$ upto n'th term.

```

#include<stdio.h>
#include<conio.h>

```

```

void main()
{
    int i,n,sum=0;

    clrscr();
    printf("How many number: ");
    scanf("%d",&n);

    for (i=1; i<=n; i++)
        sum=sum+(2*i-1)*(2*i+1)*(2*i+3)*(2*i+5);

    printf("Sum= %d",sum);
    getch();
}

```

7.15. $2.5.8+5.8.11+8.11.14+\dots$ upto n'th term.

```

#include<stdio.h>
#include<conio.h>

void main()
{
    int i,n,sum=0;

    clrscr();
    printf("How many number: ");
    scanf("%d",&n);

    for (i=1; i<=n; i++)
        sum=sum+(3*i-1)*(3*i+2)*(3*i+5);

    printf("Sum= %d",sum);
    getch();
}

```

7.16. $5.6.7+6.7.8+7.8.9+\dots$ upto n'th term.

```

#include<stdio.h>
#include<conio.h>

```

```

void main()
{
    int i,n,sum=0;

    clrscr();
    printf("How many number: ");
    scanf("%d",&n);

    for (i=1; i<=n; i++)
        sum=sum+(i+4)*(i+5)*(i+6);

    printf("Sum= %d",sum);
    getch();
}

```

8. Pyramid

8.1.

1
1 2
1 2 3
1 2 3 4
1 2 3 4 5

```

#include<stdio.h>
#include<conio.h>

void main()
{
    int i,j,n;

    clrscr();
    printf("How many line: ");
    scanf("%d",&n);

    for (i=1; i<=n; i++)
    {
        for (j=1; j<=i; j++)
            printf("%4d",j);
        printf("\n");
    }
    getch();
}

```

8.2.

1
2 2
3 3 3
4 4 4 4
5 5 5 5 5

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int i,j,n;

    clrscr();
    printf("How many line: ");
    scanf("%d",&n);

    for (i=1; i<=n; i++)
    {
        for (j=1; j<=i; j++)
        printf("%4d",j);
        printf("\n");
    }
    getch();
}
```

8.3.

1				
0	0			
1	1	1		
0	0	0	0	
:	1	1	1	1

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int i,j,n;

    clrscr();
    printf("How many line: ");
    scanf("%d",&n);

    for (i=1; i<=n; i++)
    {
        for (j=1; j<=i; j++)

```

8.4.

1			
1	0		
1	0	1	
1	0	1	0
1	0	1	0

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int i,j,n;

    clrscr();
    printf("How many line: ");
    scanf("%d",&n);

    for (i=1; i<=n; i++)
    {
        for (j=1; j<=i; j++)
        printf("%4d",j$2);
        printf("\n");
    }
    getch();
}
```

8.5.

2				
3	4			
4	5	6		
5	6	7	8	
6	7	8	9	10

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int i,j,n;

    clrscr();
    printf("How many line: ");
    scanf("%d",&n);

    for (i=1; i<=n; i++)
    {
        for (j=1; j<=i; j++)
            printf("%4d",i+j);
        printf("\n");
    }
    getch();
}
```

8.6.
 1
 2 3
 3 4 5
 4 5 6 7
 5 6 7 8 9

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int i,j,n;

    clrscr();
    printf("How many line: ");
    scanf("%d",&n);

    for (i=1; i<=n; i++)
    {
```

```
        for (j=1; j<=i; j++)
            printf("%4d",i+j-1);
        printf("\n");
    }
```

```
getch();
```

8.7.
 0
 1 0
 0 1 0
 1 0 1 0
 0 1 0 1 0

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int i,j,n;

    clrscr();
    printf("How many line: ");
    scanf("%d",&n);

    for (i=1; i<=n; i++)
    {
        for (j=1; j<=i; j++)
            printf("%4d", (i+j)%2);
        printf("\n");
    }
    getch();
}
```

8.8.
 1
 0 1
 1 0 1
 0 1 0 1
 1 0 1 0 1

```

#include<stdio.h>
#include<conio.h>

void main()
{
    int i,j,n;

    clrscr();
    printf("How many line: ");
    scanf("%d",&n);

    for (i=1; i<=n; i++)
    {
        for (j=1; j<=i; j++)
            printf("%4c", (i+j-1)%2);
        printf("\n");
    }
    getch();
}

```

8.9.
A
B B
C C C
D D D D
E E E E E

```

#include<stdio.h>
#include<conio.h>

void main()
{
    int i,j,n;

    clrscr();
    printf("How many line: ");
    scanf("%d",&n);

    for (i=1; i<=n; i++)
    {

```

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for (j=1; j<=i; j++)
printf("%4c", j+64);
printf("\n");
}
getch();
}

8.10.
A
A B
A B C
A B C D
A B C D E

```

#include<stdio.h>
#include<conio.h>

void main()
{
    int i,j,n;

    clrscr();
    printf("How many line: ");
    scanf("%d",&n);

    for (i=1; i<=n; i++)
    {
        for (j=1; j<=i; j++)
            printf("%4c", j+64);
        printf("\n");
    }
    getch();
}

```

8.11.
1 2 3 4 5
1 2 3 4
1 2 3
1 2
1

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int i,j,n;

    clrscr();
    printf("How many line: ");
    scanf("%d",&n);

    for (i=n; i>=1; i--)
    {
        for (j=1; j<=i; j++)
            printf("%4d",j);
        printf("\n");
    }
    getch();
}
```

8.12.

5	5	5	5	5
4	4	4	4	
3	3	3		
2	2			
1				

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int i,j,n;

    clrscr();
    printf("How many line: ");
    scanf("%d",&n);

    for (i=n; i>=1; i--)
    {
        for (j=1; j<=i; j++)

```

```
        printf("%4d",j);
        printf("\n");
    }
    getch();
}
```

8.13.

1	1	1	1	1
0	0	0	0	
1	1	0	1	
0	0			
1				

```
#include<stdio.h>
#include<conio.h>
```

```
void main()
```

```
{
    int i,j,n;
```

```
    clrscr();
    printf("How many line: ");
    scanf("%d",&n);

    for (i=n; i>=1; i--)
    {
        for (j=1; j<=i; j++)
            printf("%4d",j*2);
        printf("\n");
    }
    getch();
}
```

8.14.

1	0	1	0	1
1	0	1	0	
1	0	1		
1	0			
1				

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int i,j,n;

    clrscr();
    printf("How many line: ");
    scanf("%d",&n);

    for (i=n; i>=1; i--)
    {
        for (j=1; j<=i; j++)
            printf("%4d",j);
        printf("\n");
    }
    getch();
}
```

8.15.

6	7	8	9	10
5	6	7	8	
4	5	6		
3	4			
2				

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int i,j,n;

    clrscr();
    printf("How many line: ");
    scanf("%d",&n);

    for (i=n; i>=1; i--)
    {
        for (j=1; j<=i; j++)

```

```
            printf("%4d",j);
            printf("\n");
        }
        getch();
    }
```

8.16.

5	6	7	8	9
4	5	6	7	
3	4	5		
2	3			
1				

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int i,j,n;

    clrscr();
    printf("How many line: ");
    scanf("%d",&n);

    for (i=n; i>=1; i--)
    {
        for (j=1; j<=i; j++)
            printf("%4d",i+j-1);
        printf("\n");
    }
    getch();
}
```

8.17.

0	:	0	1	0
1	:	0	1	0
0	:	1	0	
1	:	0		
0				

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int i,j,n;

    clrscr();
    printf("How many line: ");
    scanf("%d",&n);

    for (i=n; i>=1; i--)
    {
        for (j=1; j<=i; j++)
        printf("%4d", (i+j)%2);
        printf("\n");
    }
    getch();
}
```

8.18.

1	0	1	0	1
0	1	0	1	
1	0	1		
0	1			
1				

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int i,j,n;

    clrscr();
    printf("How many line: ");
    scanf("%d",&n);

    for (i=n; i>=1; i--)
    {
        for (j=1; j<=i; j++)
        printf("%4d", (i+j-1)%2);
    }
}
```

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

8.19.

E	E	E	E	E
D	D	D	D	
C	C	C		
B	B			
A				

```
#include<stdio.h>
#include<conio.h>
```

```
void main()
```

```
{    int i,j,n;
```

```
    clrscr();
    printf("How many line: ");
    scanf("%d",&n);

    for (i=n; i>=1; i--)
    {
        for (j=1; j<=i; j++)
        printf("%4c",i+64);
        printf("\n");
    }
    getch();
}
```

8.20.

A	B	C	D	E
A	B	C	D	
A	B	C		
A	B			
A				

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int i,j,n;

    clrscr();
    printf("How many line: ");
    scanf("%d",&n);

    for (i=n; i>=1; i--)
    {
        for (j=1; j<=i; j++)
            printf("%4d",j+64);
        printf("\n");
    }
    getch();
}
```

8.21.

```

          1
          1 . 2
          1   2   3
          1   2   3   4
          1   2   3   4   5

```

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int i,j,n;

    clrscr();
    printf("How many line: ");
    scanf("%d",&n);

    for (i=1; i<=n; i++)

```

```

    for (j=1; j<=n-i; j--)
        printf("   ");
    for (j=1; j<=i; j++)
        printf("%4d",j);
    printf("\n");
}
getch();

```

8.22.

		1
		2
	3	3
4	4	4
5	5	5

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int i,j,n;

    clrscr();
    printf("How many line: ");
    scanf("%d",&n);

    for (i=1; i<=n; i++)
    {
        for (j=1; j<=n-i; j--)
            printf("   ");
        for (j=1; j<=i; j++)
            printf("%4d",j);
        printf("\n");
    }
    getch();
}
```

8.23.

```

      1
      0 0
      1 1 1
  0 0 0 0
  1 1 1 1 1

#include<stdio.h>
#include<conio.h>

void main()
{
    int i,j,n;

    clrscr();
    printf("How many line: ");
    scanf("%d",&n);

    for (i=1; i<=n; i++)
    {
        for (j=1; j<=n-i; j++)
        printf("    ");
        for (j=1; j<=i; j++)
        printf("%4d",j%2);
        printf("\n");
    }
    getch();
}

```

8.24.

```

      1
      1 0
      1 0 1 0
  1 0 1 0 1

#include<stdio.h>
#include<conio.h>

```

```

void main()
{
    int i,j,n;

    clrscr();
    printf("How many line: ");
    scanf("%d",&n);

    for (i=1; i<=n; i++)
    {
        for (j=1; j<=n-i; j++)
        printf("    ");
        for (j=1; j<=i; j++)
        printf("%4d",j%2);
        printf("\n");
    }
    getch();
}

```

8.25.

```

      1
      2 2
      3 3 3
      4 4 4 4
  5 5 5 5 5

#include<stdio.h>
#include<conio.h>

void main()
{
    int i,j,n;

    clrscr();
    printf("How many line: ");
    scanf("%d",&n);

    for (i=1; i<=n; i++)

```

```

    {
        for (j=1; j<=n-i; j++)
            printf(" ");
        for (j=1; j<=i; j++)
            printf("%4c",i);
        printf("\n");
    }
    getch();
}

```

8.26.

```

      A
     B   B
    C   C   C
   D   D   D   D
  E   E   E   E

```

```

#include<stdio.h>
#include<conio.h>

void main()
{
    int i,j,n;

    clrscr();
    printf("How many line: ");
    scanf("%d",&n);

    for (i=1; i<=n; i--)
    {
        for (j=1; j<=n-i; j++)
            printf(" ");
        for (j=1; j<=i; j++)
            printf("%4c",i-64);
        printf("\n");
    }
    getch();
}

```

8.27.

```

      A
     B   B
    C   C   C
   D   D   D   D
  E   E   E   E
 D   D   D   D
 C   C   C
 B   B
 A

```

```

#include<stdio.h>
#include<conio.h>

void main()
{
    int i,j,n;

    clrscr();
    printf("How many line: ");
    scanf("%d",&n);

    for (i=1; i<=n; i++)
    {
        for (j=1; j<=n-i; j++)
            printf(" ");
        for (j=1; j<=i; j++)
            printf("%4c",i+64);
        printf("\n");
    }

    for (i=n-1; i>=1; i--)
    {
        for (j=1; j<=n-i; j++)
            printf(" ");
        for (j=1; j<=i; j++)
            printf("%4c",i+64);
        printf("\n");
    }
    getch();
}

```

8.28.

```

    1
   2   2
  3   3   3
  4   4   4   4
  5   5   5   5
  4   4   4   4
  3   3   3
  2   2
    1

#include<stdio.h>
#include<conio.h>

void main()
{
    int i,j,n;

    clrscr();
    printf("How many line: ");
    scanf("%d",&n);

    for (i=1; i<=n; i++)
    {
        for (j=1; j<=n-i; j++)
        printf("   ");
        for (j=1; j<=i; j++)
        printf("%4d",j);
        printf("\n");
    }

    for (i=n-1; i>=1; i--)
    {
        for (j=1; j<=n-i; j++)
        printf("   ");
        for (j=1; j<=i; j++)
        printf("%4d",j);
        printf("\n");
    }
    getch();
}

```

8.29.

```

    1
    2
   3   3   3
   4   4   4   4
   5   5   5   5
   4   4   4   4
   3   3   3
   2   2
    1

#include<stdio.h>
#include<conio.h>

void main()
{
    int i,j,n;

    clrscr();
    printf("How many line: ");
    scanf("%d",&n);

    for (i=1; i<=n; i++)
    {
        for (j=1; j<=i; j++)
        printf("%4d",j);
        printf("\n");
    }

    for (i=n-1; i>=1; i--)
    {
        for (j=1; j<=i; j++)
        printf("%4d",j);
        printf("\n");
    }
    getch();
}

```

8.30.

```

      1
      2 2
      3 3 3
      4 4 4 4
      5 5 5 5
      4 4 4 4
      3 3 3
      2 2
      1
#include<stdio.h>
#include<conio.h>

void main()
{
    int i,j,n;

    clrscr();
    printf("How many line: ");
    scanf("%d",&n);

    for (i=1; i<=n; i++)
    {
        for (j=1; j<=n-i; j++)
        printf("    ");
        for (j=1; j<=i; j++)
        printf("%4d",j);
        printf("\n");
    }

    for (i=n-1; i>=1; i--)
    {
        for (j=1; j<=n-i; j++)
        printf("    ");
        for (j=1; j<=i; j++)
        printf("%4d",j);
        printf("\n");
    }
getch();
}

```

8.31.

```

      1
      2 1
      3 2 1
      4 3 2 1
      5 4 3 2 1
      1 2 3 4 5 4 3 2 1
#include<stdio.h>
#include<conio.h>

void main()
{
    int i,j,n;

    clrscr();
    printf("How many line: ");
    scanf("%d",&n);

    for (i=1; i<=n; i++)
    {
        for (j=1; j<=n-i; j++)
        printf("    ");
        for (j=1; j<=i; j++)
        printf("%4d",j);
        for (j=i-1; j>=1; j--)
        printf("%4d",j);
        printf("\n");
    }

    getch();
}

```

8.32.

```

      1
      2 1
      3 2 1
      4 3 2 1
      5 4 3 2 1
      1 2 3 4 5 4 3 2 1
      2 3 4 5 4 3 2 1
      3 4 5 4 3 2 1
      4 5 4 3 2 1
      5 4 3 2 1
      1 2 3 2 1
      2 1

```

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int i,j,n;

    clrscr();
    printf("How many line: ");
    scanf("%d",&n);

    for (i=1; i<=n; i++)
    {
        for (j=1; j<=n-i; j++)
        printf("      ");
        for (j=1; j<=i; j++)
        printf("%4d",j);
        for (j=i-1; j>=1; j--)
        printf("%4d",j);
        printf("\n");
    }

    for (i=n-1; i>=1; i--)
    {
        for (j=1; j<=n-i; j++)
        printf("      ");
        for (j=1; j<=i; j++)
        printf("%4d",j);
        for (j=i-1; j>=1; j--)
        printf("%4d",j);
        printf("\n");
    }
}

catch();

```

7	6	5	4	3	2	1	6	5	4	3	2	1	6	5
8	7	6	5	4	3	2	9	8	7	6	5	4	9	8
6	5	4	3	2	1	10	11	10	9	8	7	6	10	9
						12	13	12	11	10	9	8	7	6
						11	10	9	8	7	6	5	4	3
						10	11	10	9	8	7	6	5	4
						12	13	12	11	10	9	8	7	6
						13	12	11	10	9	8	7	6	5
						11	10	9	8	7	6	5	4	3
						10	9	8	7	6	5	4	3	2
						9	8	7	6	5	4	3	2	1
						8	7	6	5	4	3	2	1	10
						7	6	5	4	3	2	1	10	9
						6	5	4	3	2	1	10	9	8
						5	4	3	2	1	10	9	8	7
						4	3	2	1	10	9	8	7	6
						3	2	1	10	9	8	7	6	5
						2	1	10	9	8	7	6	5	4
						1	10	9	8	7	6	5	4	3

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int i,j,n;

    clrscr();
    printf("How many line: ");
    scanf("%d",&n);

    for (i=1; i<=n; i++)
    {
        for (j=1; j<=n-i; j++)
            printf("      ");
        for (j=i; j<=2*i-1; j++)
            printf("%4d",j);
        for (j=2*i-2; j>=i; j--)
            printf("%4d",j);
        printf("\n");
    }

    for (i=n-1; i>=1; i--)
    {
        for (j=1; j<=n-i; j++)
            printf("      ");
    }
}
```

Ashraf

```

    for (j=i; j<=2*i-1; j++)
        printf("%4d",j);
    for (j=2*i-2; j>=i; j--)
        printf("%4d",j);
        printf("\n");
    }
    getch();
}

```

8.34.

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

```

#include<stdio.h>
#include<conio.h>

void main()
{
    int i,j,n;

    clrscr();
    printf("How many line: ");
    scanf("%d",&n);

    for (i=1; i<=n; i++)
    {
        for (j=1; j<=n-i; j++)
            printf("   ");
        for (j=i; j<=2*i-1; j++)

```

```

        printf("%4d",j);
        for (j=2*i-2; j>i; j--)
            printf("%4d",j);
        printf("\n");
    }
    getch();
}

```

8.35.

1				
2	3			
4	5	6		
7	8	9	10	
11	12	13	14	15

```

#include<stdio.h>
#include<conio.h>

void main()
{
    int i,j,k=1,n;

    clrscr();
    printf("How many line: ");
    scanf("%d",&n);

    for (i=1; i<=n; i++)

```

```

    for (j=1; j<=i; j++)
printf("%4d", k++);
printf("\n");
}
getch();
}

```

8.36.

```

1
2   1
3   3   1
4   6   4   1
5   10  10  5   1
6   15  15  15  6   1

```

```

#include<stdio.h>
#include<conio.h>

void main()
{
    int i,j,c,n;

    clrscr();
    printf("How many line: ");
    scanf("%d",&n);

    for (i=1; i<=n; i++)
    {
        c=1;
        for (j=1; j<=i; j++)
        {
            c=c*(i-j+1)/j;
            printf("%4d",c);
        }
        printf("\n");
    }
    getch();
}

```

8.37.

```

1
1   1
1   2   1
1   3   3   1
1   4   6   4   1
1   5   10  10  5   1
1   6   15  20  15  6   1

```

```

#include<stdio.h>
#include<conio.h>

void main()
{
    int i,j,c,n;

    clrscr();
    printf("How many line: ");
    scanf("%d",&n);

    for (i=1; i<=n; i++)
    {
        c=1;
        for (j=1; j<=i; j++)
        {
            printf("%4d",c);
            c=c*(i-j)/j;
        }
        printf("\n");
    }
    getch();
}

```

9. Loop

9.1. Write a program that read a positive integer and display its factorial.

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int i,n;
    long fact=1;

    clrscr();
    printf("Enter any number: ");
    scanf("%d",&n);

    for (i=1; i<=n; i++)
        fact=fact*i;

    printf("Factorial %d= %ld",n,fact);
    getch();
}
```

9.2. Write a program that read any positive integer and display sum of its digit.

```
#include<stdio.h>
#include<conio.h>

void main()
{
```

```
int i,n,sum=0;

clrscr();
printf("Enter any number: ");
scanf("%d",&n);

while(n>0)
{
    sum=sum+n%10;
    n=n/10;
}

printf("Sum of digit= %d",sum);
getch();
```

9.3. Write a program that read any positive integer and display reverse.

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int i,n,sum=0;

    clrscr();
    printf("Enter any number: ");
    scanf("%d",&n);

    while(n>0)
    {
        sum=sum*10+n%10;
        n=n/10;
    }

    printf("Sum of digit= %d",sum);
    getch();
}
```

9.4. Write a program that read any decimal number and display equivalent binary number.

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int i,n;

    clrscr();
    printf("Enter any decimal number: ");
    scanf("%d",&n);

    printf("Equivalent binary number is: ");
    for (i=15; i>=0; i--)
        printf("%d", (n>>i)&1);
    getch();
}
```

9.5. Write a program that read any decimal number and display equivalent octal number.

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int i,n;

    clrscr();
    printf("Enter any decimal number: ");
    scanf("%d",&n);

    printf("Equivalent octal number is: ");
    for (i=15; i>=0; i-=3)
        printf("%d", (n>>i)&7);
    getch();
}
```

9.6. Write a program that read any decimal number and display equivalent hexadecimal number.

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int i,n,t;

    clrscr();
    printf("Enter any decimal number: ");
    scanf("%d",&n);

    printf("Equivalent hexadecimal number is: ");
    for (i=12; i>=0; i-=4)
    {
        t=(n>>i)&15;

        if (t<10)
            printf("%d",t);
        else
            printf("%c",t+55);
    }
    getch();
}
```

9.7. Write a program that read two numbers and display GCD(greatest common divisor).

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int a,b,c;

    clrscr();
    printf("a= ");
```

```

scanf("%d", &a);
printf("b= ");
scanf("%d", &b);

while(a!=b)
{
    c=a%b;
    a=b;
    b=c;
}

printf("GCD= %d", b);
getch();
}

```

9.8. Write a program that read two numbers and display LCM(least common multiple).

```

#include<stdio.h>
#include<conio.h>

void main()
{
    int a,b,i,lcm;

    clrscr();
    printf("a= ");
    scanf("%d", &a);
    printf("b= ");
    scanf("%d", &b);

    lcm=1;
    for (i=2; i<=a && i<=b; i++)
    {
        while(a%i==0 && b%i==0)
        {
            a=a/i;
            b=b/i;
            lcm=lcm*i;
        }
    }
}

```

```

lcm=lcm*a*b;
printf("LCM= %d", lcm);
getch();
}

```

9.9. Write a program that read two numbers(x,y) and display x^y (x to the power y).

```

#include<stdio.h>
#include<conio.h>

void main()
{
    int x,y,p=1,i;

    clrscr();
    printf("x= ");
    scanf("%d", &x);
    printf("y= ");
    scanf("%d", &y);

    for (i=1; i<=y; i++)
        p=p*x;

    printf("%d to the power %d= %d", x, y, p);
    getch();
}

```

9.10. Write a program that read two numbers (n,r) and display nPr(Permutation).

```

#include<stdio.h>
#include<conio.h>

void main()
{
    int n,r,i;
}

```

```

long factn,factr,p;
clrscr();
printf("n= ");
scanf("%d",&n);
printf("r= ");
scanf("%d",&r);

factn=1;
for (i=1; i<=n; i++)
factn=factn*i;

factr=1;
for (i=1; i<=r; i++)
factr=factr*i;

p=factn/factr;
printf("nPPr= %ld",p);
getch();
}

```

9.11. Write a program that read two numbers(n,r) and display nPr(Permutation).

```

#include<stdio.h>
#include<conio.h>

void main()
{
    int n,r,i;
    long p;

    clrscr();
    printf("n= ");
    scanf("%d",&n);
    printf("r= ");
    scanf("%d",&r);

    p=1;
    for (i=r+1; i<=n; i++)
}

```

```

p=p*i;
printf("nPPr= %ld",p);
getch();
}

```

9.12. Write a program that read two numbers(n,r) and display nPr(Permutation).

```

#include<stdio.h>
#include<conio.h>

void main()
{
    int n,r,i;
    long p;

    clrscr();
    printf("n= ");
    scanf("%d",&n);
    printf("r= ");
    scanf("%d",&r);

    for (p=1,i=r+1; i<=n; p=p*i--);

    printf("nPPr= %ld",p);
    getch();
}

```

9.13. Write a program that read two numbers(n,r) and display nCr(Combination).

```

#include<stdio.h>
#include<conio.h>

void main()
{
    int n,r,i;
    long factn,factr,factnr,p;
}

```

```

clrscr();
printf("n= ");
scanf("%d",&n);
printf("r= ");
scanf("%d",&r);

factn=1;
for (i=1; i<=n; i++)
factn=factn*i;

factr=1;
for (i=1; i<=r; i++)
factr=factr*i;

factnr=1;
for (i=1; i<=n-r; i++)
factnr=factnr*i;

p=factn/(factr*factnr);
printf("nCr= %ld",p);
getch();
}

```

9.14. Write a program that read two numbers(n,r) and display nCr (Combination).

```

#include<stdio.h>
#include<conio.h>

void main()
{
    int n,r,i;
    long p;

    clrscr();
    printf("n= ");
    scanf("%d",&n);
    printf("r= ");

```

```

scanf("%d",&r);

p=1;
for (i=1; i<=r; i++)
p=p*(n-i+1)/i;

printf("nCr= %ld",p);
getch();
}

```

9.15. Write a program that read two numbers(n,r) and display nCr (Combination).

```

#include<stdio.h>
#include<conio.h>

void main()
{
    int n,r,i;
    long p;

    clrscr();
    printf("n= ");
    scanf("%d",&n);
    printf("r= ");
    scanf("%d",&r);

    if (n-r<r)
        r=n-r;

    p=1;
    for (i=1; i<=r; i++)
    p=p*(n-i+1)/i;

    printf("nCr= %ld",p);
    getch();
}

```

9.16. Write a program that read two numbers(n,r) and display nCr (Combination).

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int n,r,i;
    long p;

    clrscr();
    printf("n= ");
    scanf("%d",&n);
    printf("r= ");
    scanf("%d",&r);

    if (n-r<r)
        r=n-r;

    p=1;
    for (i=1; i<=r; p=p*(n-i+1)/i, i++);

    printf("nCr= %ld",p);
    getch();
}
```

9.17. Write a program that read any integer and its digital root.

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int n,r;

    clrscr();
    printf("Enter any integer number: ");
    scanf("%d",&n);
}
```

```
while(n>9)
{
    r=0;
    while(n>0)
    {
        r=r+n%10;
        n=n/10;
    }
    n=r;
}

printf("Digital root= %d",n);
getch();
}
```

9.18. Write a program that read any integer and test prime or not prime.

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int n,i,isprime;

    clrscr();
    printf("Enter any number: ");
    scanf("%d",&n);

    if (n<2)
        isprime=0;

    else
        isprime=1;

    for (i=2; i<n; i++)
        if (n%i==0)
            isprime=0;
```

```

if (isprime==1)
printf("Prime");
else
printf("Not prime");
getch();
}

```

9.19. Write a program that read any integer and test prime or not prime.

```

#include<stdio.h>
#include<conio.h>

void main()
{
    int n,i,isprime;

    clrscr();
    printf("Enter any number: ");
    scanf("%d",&n);

    if (n<2)
    isprime=0;

    else
    {
        isprime=1;

        for (i=2; i<n; i++)
        if (n%i==0)
        isprime=0;
    }

    if (isprime==1)
    printf("Prime");
    else
    printf("Not prime");
    getch();
}

```

9.20. Write a program that read any integer and test prime or not prime.

```

#include<stdio.h>
#include<conio.h>

void main()
{
    int n,i,isprime;

    clrscr();
    printf("Enter any number: ");
    scanf("%d",&n);

    if (n<2)
    isprime=0;

    else
    {
        isprime=1;

        for (i=2; i<n; i++)
        if (n%i==0)
        {
            isprime=0;
            break;
        }
    }

    if (isprime==1)
    printf("Prime");
    else
    printf("Not prime");
    getch();
}

```

9.21. Write a program that read any integer and test prime or not prime.

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int n,i,isprime;

    clrscr();
    printf("Enter any number: ");
    scanf("%d",&n);

    if (n<2)
        isprime=0;
    else
    {
        isprime=1;

        for (i=2; i<=n/2; i++)
            if (n%i==0)
            {
                isprime=0;
                break;
            }

        if (isprime==1)
            printf("Prime");
        else
            printf("Not prime");
        getch();
    }
}
```

9.22. Write a program that read any integer and test prime or not prime.

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int n,i,isprime,t;

    clrscr();
    printf("Enter any number: ");
    scanf("%d",&n);

    if (n<2)
        isprime=0;
    else
    {
        isprime=1;

        t=n/2;
        for (i=2; i<=t; i++)
            if (n%i==0)
            {
                isprime=0;
                break;
            }

        if (isprime==1)
            printf("Prime");
        else
            printf("Not prime");
        getch();
    }
}
```

9.23. Write a program that read any integer and test prime or not prime.

```
#include<stdio.h>
#include<conio.h>
#include<math.h>

void main()
{
    int n,i,isprime,t;
    clrscr();
    printf("Enter any number: ");
    scanf("%d",&n);

    if (n<2)
        isprime=0;
    else
    {
        isprime=1;
        t=sqrt(n);
        for (i=2; i<=t; i++)
            if (n%i==0)
            {
                isprime=0;
                break;
            }

        if (isprime==1)
            printf("Prime");
        else
            printf("Not prime");
    }
    getch();
}
```

9.24. Write a program that print all prime numbers from 1 to 100.

```
#include<stdio.h>
#include<conio.h>
#include<math.h>

void main()
{
    int n,i,j,isprime,t;

    clrscr();
    printf("n= ");
    scanf("%d",&n);

    for (i=2; i<=n; i++)
    {
        isprime=1;
        t=sqrt(i);

        for (j=2; j<=t; j++)
            if (i%j==0)
            {
                isprime=0;
                break;
            }

        if (isprime==1)
            printf("%8d",i);
    }
    getch();
}
```

9.25. Write a program that print all prime numbers from m to n ($m > n$).

```
#include<stdio.h>
#include<conio.h>
#include<math.h>
```

```

void main()
{
    int m,n,i,j,isprime,t;
    clrscr();
    printf("m= ");
    scanf("%d",&m);
    printf("n= ");
    scanf("%d",&n);

    for (i=m; i<=n; i++)
    {
        if (i<2)
            isprime=0;
        else
            isprime=1;
        t=sqrt(i);

        for (j=2; j<=t; j++)
        if (i%j==0)
        {
            isprime=0;
            break;
        }

        if (isprime==1)
            printf("%d",i);
    }
    getch();
}

```

9.26. Write a program that count total prime numbers from 1 to n.

```

#include<stdio.h>
#include<conio.h>
#include<math.h>

void main()

```

Ashraf

```

    {
        int n,i,j,isprime,t,count=0;

        clrscr();
        printf("n= ");
        scanf("%d",&n);

        for (i=2; i<=n; i++)
        {
            isprime=1;
            t=sqrt(i);

            for (j=2; j<=t; j++)
            if (i%j==0)
            {
                isprime=0;
                break;
            }

            if (isprime==1)
                count++;
        }

        printf("Total prime number= %d",count);
        getch();
    }

```

Ashraf

9.27. Write a program that displays first n prime numbers.

```

#include<stdio.h>
#include<conio.h>
#include<math.h>

void main()
{
    int n,i,j,isprime,t,count=0;

    clrscr();
    printf("n= ");
    scanf("%d",&n);

```

```

for (i=2; count<n; i++)
{
    isprime=1;
    t=sqrt(i);

    for (j=2; j<=t; j++)
    if (i%j==0)
    {
        isprime=0;
        break;
    }

    if (isprime==1)
    {
        printf("%8d",i);
        count++;
    }
}

getch();
}

```

9.28. Write a program that print first n Fibonacci numbers.

```

#include<stdio.h>
#include<conio.h>

void main()
{
    long a,b,c;
    int n,i;

    clrscr();
    printf("How many numbers: ");
    scanf("%d",&n);

    a=0;
    b=1;

```

```

for (i=1; i<=n; i++)
{
    printf("%10ld",a);
    c=a+b;
    a=b;
    b=c;
}
getch();
}

```

9.29. Write a program that prints all Fibonacci numbers from 1 to n.

```

#include<stdio.h>
#include<conio.h>

void main()
{
    long a,b,c;
    int n,i;

    clrscr();
    printf("n= ");
    scanf("%d",&n);

    a=0;
    b=1;
    for (i=1; a<=n; i++)
    {
        printf("%10ld",a);
        c=a+b;
        a=b;
        b=c;
    }
}

```

$a = 1 + 2 \dots$

$a = b = c$

$a = b = ?$

9.30. Write a program that a number Fibonacci or not Fibonacci.

```
#include<stdio.h>
#include<conio.h>

void main()
{
    long a,b,c;
    int n,i;

    clrscr();
    printf("n=");
    scanf("%d",&n);

    a=0;
    b=1;
    for (i=1; a<n; i++)
    {
        c=a+b;
        a=b;
        b=c;
    }
    if (a==n)
        printf("Fibonacci");
    else
        printf("Not Fibonacci");
    getch();
}
```

10. One Dimensional Array

10.1. Write a program that read and display an array.

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int i,n,a[100];

    clrscr();
    printf("How many numbers: ");
    scanf("%d",&n);

    for (i=0; i<n; i++)
    scanf("%d",&a[i]);

    for (i=0; i<n; i++)
    printf("%d",a[i]);
    getch();
}
```

10.2. Write a program that read and display sum.

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int i,n,a[100],sum=0;

    clrscr();
    printf("How many numbers: ");
    scanf("%d",&n);
```

```

for (i=0; i<n; i++)
scanf("%d", &a[i]);

for (i=0; i<n; i++)
sum=sum+a[i];

printf("Sum= %d", sum);
getch();
}

```

10.3. Write a program that read and display sum.

```

#include<stdio.h>
#include<conio.h>

void main()
{
    int i,n,a[100],sum=0;

    clrscr();
    printf("How many numbers: ");
    scanf("%d",&n);

    for (i=0; i<n; i++)
    {
        scanf("%d", &a[i]);
        sum=sum+a[i];
    }

    printf("Sum= %d", sum);
    getch();
}

```

10.4. Write a program that read and display average.

```

#include<stdio.h>
#include<conio.h>

void main()
{

```

```

int i,n,a[100],sum=0,avg;

clrscr();
printf("How many numbers: ");
scanf("%d",&n);

for (i=0; i<n; i++)
{
    scanf("%d", &a[i]);
    sum=sum+a[i];
}

avg=sum/n;
printf("Average= %d", avg);
getch();
}

```

10.5. Write a program that read and display average.

```

#include<stdio.h>
#include<conio.h>

void main()
{
    int i,n,a[100],sum=0;

    clrscr();
    printf("How many numbers: ");
    scanf("%d",&n);

    for (i=0; i<n; i++)
    {
        scanf("%d", &a[i]);
        sum=sum+a[i];
    }

    printf("Average= %d", sum/n);
    getch();
}

```

10.6. Write a program that read and display average.

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int i,n,a[100],sum=0;

    clrscr();
    printf("How many numbers: ");
    scanf("%d",&n);

    for (i=0; i<n; i++)
    {
        scanf("%d",&a[i]);
        sum=sum+a[i];
    }

    printf("Average= %f", (float)sum/n);
    getch();
}
```

10.7. Write a program that read an array and display maximum.

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int i,n,a[100],max;

    clrscr();
    printf("How many numbers: ");
    scanf("%d",&n);

    for (i=0; i<n; i++)
        scanf("%d",&a[i]);
```

```
:=a[0];
for (i=1; i<n; i++)
    if (a[i]>max)
        max=a[i];

printf("Maximum= %d",max);
getch();
```

Write a program that read an array and display minimum.

```
#include<stdio.h>
#include<conio.h>

main()
{
    int i,n,a[100],min;

    clrscr();
    printf("How many numbers: ");
    scanf("%d",&n);

    for (i=0; i<n; i++)
        scanf("%d",&a[i]);

    min=a[0];
    for (i=1; i<n; i++)
        if (a[i]<min)
            min=a[i];

    printf("Minimum= %d",min);
    getch();
```

✓ Write a program that inserts any number in an array.

```
#include<stdio.h>
#include<conio.h>
```

```

void main()
{
    int i,n,a[100],p;
    clrscr();
    printf("How many numbers: ");
    scanf("%d",&n);
    for (i=0; i<n; i++)
        scanf("%d",&a[i]);
    printf("Enter any position to insert: ");
    scanf("%d",&p);
    if (p<0 || p>n)
        printf("Insert is impossible.");
    else
    {
        for (i=n-1; i>=p; i--)
            a[i+1]=a[i];
        printf("Enter any number to insert: ");
        scanf("%d",&a[p]);
        n++;
    }
    printf("\nAfter insert array contains: \n");
    for (i=0; i<n; i++)
        printf("%d",a[i]);
    getch();
}

```

10.10. Write a program that deletes any number from a array,

```

#include<stdio.h>
#include<conio.h>

void main()
{
    int i,n,a[100],p;

```

```

clrscr();
printf("How many numbers: ");
scanf("%d",&n);
for (i=0; i<n; i++)
    scanf("%d",&a[i]);
printf("Enter any position to delete: ");
scanf("%d",&p);
if (p<0 || p>n)
    printf("Delete is impossible.");
else
{
    for (i=p+1; i<n; i++)
        a[i-1]=a[i];
    n--;
}
printf("\nAfter delete the array contains: \n");
for (i=0; i<n; i++)
    printf("%d",a[i]);
getch();
}

```

10.11. Write a program that searches any number from an array.

```

#include<stdio.h>
#include<conio.h>

void main()
{
    int i,n,a[100],num,found;
    clrscr();
    printf("How many numbers: ");
    scanf("%d",&n);
    for (i=0; i<n; i++)
        scanf("%d",&a[i]);

```

```

printf("Enter any number to search: ");
scanf("%d", &num);

found=0;
for (i=0; i<n; i++)
if (a[i]==num)
i =dd=1;

if (found==1)
printf("Found.");
else
printf("Not found.");
getch();

```

- 10.12. Write a program that read and sort an array using bubble sort in ascending order.

```

#include<stdio.h>
#include<conio.h>

void main()
{
    int i,n,a[100],outer,inner,temp;

    clrscr();
    printf("How many numbers: ");
    scanf("%d",&n);

    for (i=0; i<n; i++)
        scanf("%d",&a[i]);

    for (outer=n-1; outer>0; outer--)
    for (inner=0; inner<outer; inner++)
    if (a[inner]>a[inner+1])

        temp=a[inner];
        a[inner]=a[inner+1];
        a[inner+1]=temp;
}

```

627 AT 202

```

printf("\nAfter sorting the array contains:
");
for (i=0; i<n; i++)
printf("%4d",a[i]);
getch();

```

- 10.3. Write a program that read and sort an array using bubble sort in descending order.

```

#include<stdio.h>
#include<conio.h>

void main()
{
    int i,n,a[100],outer,inner,temp;

    clrscr();
    printf("How many numbers: ");
    scanf("%d",&n);

    for (i=0; i<n; i++)
        scanf("%d",&a[i]);

    for (outer=n-1; outer>0; outer--)
    for (inner=0; inner<outer; inner++)
    if (a[inner]<a[inner+1])

        temp=a[inner];
        a[inner]=a[inner+1];
        a[inner+1]=temp;
}

printf("\nAfter sorting the array contains:
");
for (i=0; i<n; i++)
printf("%4d",a[i]);
getch();

```

10.14. Write a program that read an array and display medium.

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int i,n,a[100],outer,inner,temp;
    clrscr();
    printf("How many numbers: ");
    scanf("%d",&n);
    for (i=0; i<n; i++)
        scanf("%d",&a[i]);
    for (outer=n-1; outer>0; outer--)
        for (inner=0; inner<outer; inner++)
            if (a[inner]>a[inner+1])
            {
                temp=a[inner];
                a[inner]=a[inner+1];
                a[inner+1]=temp;
            }
    printf ("\nAfter sorting the array contains:
    ");
    for (i=0; i<n; i++)
        printf ("%d",a[i]);
    if (n&2==1)
        printf ("\nMedium= %d",a[n/2]);
    else
        printf ("\nMedium= %d and %d",a[n/2-1],a[n/2]);
    getch();
}
```

10.15. Write a program that display first n Fibonacci numbers.

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int i,n;
    long a[100];
    clrscr();
    printf("How many numbers: ");
    scanf("%d",&n);
    a[0]=0;
    a[1]=1;
    for (i=2; i<n; i++)
        a[i]=a[i-1]+a[i-2];
    for (i=0; i<n; i++)
        printf("%10ld",a[i]);
    getch();
}
```

10.16. Write a program that displays first n prime numbers.

```
#include<stdio.h>
#include<conio.h>
#include<math.h>

void main()
{
    long i,j,n,t,p,a[10000];
    int isprime;
    clrscr();
    printf("How many prime numbers: ");
    scanf("%d",&n);
}
```

```
p=0;
for (i=2; p<n; i++)
{
    isprime=1;
    t=sqrt(i);
    for (j=2; j<=t; j++)
        if (i/j==0)
    {
        isprime=0;
        break;
    }

    if (isprime==1)
        a[p++]=i;
}

for (i=0; i<n; i++)
printf("%10d",a[i]);
getch();
}
```

10.17. Write a program that reads any decimal number and display equivalent binary number.

```
#include<stdio.h>
#include<conio.h>

void main()
{
    long num;
    int i,n,a[100];

    clrscr();
    printf("Enter any decimal number: ");
    scanf("%ld",&num);

    n=0;
    while(num>0)
    {
        a[n]=num%2;
        num=num/2;
        n++;
    }
}
```

```
num=num/2;
n++;
}

printf("\n Equivalents binary number is: ");
for (i=n-1; i>=0; i--)
printf("%d",a[i]);
getch();
}
```

11. Multi Dimensional Array

11.1. Write a program that read and display a matrix.

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int i,j,r,c,a[10][10];

    clrscr();
    printf("How many row: ");
    scanf("%d",&r);
    printf("How many column: ");
    scanf("%d",&c);

    for (i=0; i<r; i++)
        for (j=0; j<c; j++)
            scanf("%d",&a[i][j]);

    for (i=0; i<r; i++)
    {
        for (j=0; j<c; j++)
            printf("%d",a[i][j]);
        printf("\n");
    }
    getch();
}
```

11.2. Write a program that adds two matrices.

```
#include<stdio.h>
#include<conio.h>

void main()
```

```
int i, j, r1, c1, r2, c2, a[10][10], b[10][10],
c[10][10];

clrscr();
printf("How many row in A: ");
scanf("%d",&r1);
printf("How many column in A: ");
scanf("%d",&c1);

for (i=0; i<r1; i++)
    for (j=0; j<c1; j++)
        scanf("%d",&a[i][j]);

printf("How many row in B: ");
scanf("%d",&r2);
printf("How many column in B: ");
scanf("%d",&c2);

for (i=0; i<r2; i++)
    for (j=0; j<c2; j++)
        scanf("%d",&b[i][j]);

if (r1==r2 && c1==c2)
{
    for (i=0; i<r1; i++)
        for (j=0; j<c1; j++)
            c[i][j]=a[i][j]+b[i][j];

    printf("\nThe sum of A and B is: \n");
    for (i=0; i<r1; i++)
    {
        for (j=0; j<c1; j++)
            printf("%d",c[i][j]);
        printf("\n");
    }
}
else
    printf("\nThe sum of A and B is impossible.");
getch();
```

11.3. Write a program that multiplies two matrices.

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int
i,j,k,r1,c1,r2,c2,a[10][10],b[10][10],d[10][10];
    clrscr();
    printf("How many row in A: ");
    scanf("%d",&r1);
    printf("How many column in A: ");
    scanf("%d",&c1);

    for (i=0; i<r1; i++)
    for (j=0; j<c1; j++)
        scanf("%d",&a[i][j]);

    printf("How many row in A: ");
    scanf("%d",&r2);
    printf("How many column in A: ");
    scanf("%d",&c2);

    for (i=0; i<r2; i++)
    for (j=0; j<c2; j++)
        scanf("%d",&b[i][j]);

    if (c1==r2)
    {
        for (i=0; i<r1; i++)
        for (j=0; j<c2; j++)
        {
            d[i][j]=0;
            for (k=0; k<c1; k++)
                d[i][j]=d[i][j]+a[i][k]*b[k][j];
        }
    }
}
```

```
printf("\nThe multiplication of A and B is:
\n");
for (i=0; i<r1; i++)
{
    for (j=0; j<c2; j++)
        printf("%4c",d[i][j]);
    printf("\n");
}
else
    printf("\nThe multiplication of A and B is
impossible.");
getch();
}
```

11.4. Write a program that add and multiply two matrices.

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int
i,j,r1,c1,r2,c2,a[10][10],b[10][10],c[10][10],d[10][10];

    clrscr();
    printf("How many row in A: ");
    scanf("%d",&r1);
    printf("How many column in A: ");
    scanf("%d",&c1);

    for (i=0; i<r1; i++)
    for (j=0; j<c1; j++)
        scanf("%d",&a[i][j]);

    printf("How many row in A: ");
    scanf("%d",&r2);
    printf("How many column in A: ");
    scanf("%d",&c2);

    for (i=0; i<r1; i++)
    for (j=0; j<c2; j++)
        c[i][j]=a[i][j]+b[i][j];
}
```

```

for (i=0; i<r2; i++)
for (j=0; j<c2; j++)
scanf("%d",&b[i][j]);

if (r1==r2 && c1==c2)
{
    for (i=0; i<r1; i++)
    for (j=0; j<c1; j++)
        c[i][j]=a[i][j]+b[i][j];
}

printf("\nThe sum of A and B is: \n");
for (i=0; i<r1; i++)
{
    for (j=0; j<c1; j++)
        printf("%4d",c[i][j]);
    printf("\n");
}
else
printf("\nThe sum of A and B is impossible.");
if (c1==r2)
{
    for (i=0; i<r1; i++)
    for (j=0; j<c2; j++)
    {
        d[i][j]=0;
        for (k=0; k<c1; k++)
            d[i][j]=d[i][j]+a[i][k]*b[k][j];
    }

printf("\nThe multiplication of A and B is:
\n");
for (i=0; i<r1; i++)
{
    for (j=0; j<c2; j++)
        printf("%4d",d[i][j]);
    printf("\n");
}
else

```

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```

printf("\nThe multiplication of A and B is
impossible.");
getch();
}

```

11.5. Write a program that display Pascal pyramid.

```

1
2   1
3   3   1
4   6   4   1
5   10  10  5   1

#include<stdio.h>
#include<conio.h>

void main()
{
    int i,j,n,a[20][20];

    clrscr();
    printf("How many line: ");
    scanf("%d",&n);

    for (i=0; i<n; i++)
    {
        for (j=0; j<=i; j++)
        {
            if (j==0)
                a[i][j]=i+1;
            else if (i==j)
                a[i][j]=1;
            else
                a[i][j]=a[i-1][j-1]+a[i-1][j];
            printf("%4d",a[i][j]);
        }
        printf("\n");
    }
    getch();
}

```

12. String.h

12.1. Write a program that read a line of text and display its length.

```
#include<stdio.h>
#include<conio.h>
#include<string.h>

void main()
{
    char st[100];
    int l;

    clrscr();
    printf("Enter any line of text: ");
    gets(st);

    l=strlen(st);
    printf("Length= %d",l);
    getch();
}
```

12.2. Write a program that read a line of text and display its in reverse order.

```
#include<stdio.h>
#include<conio.h>
#include<string.h>

void main()
{
    char st[100];

    clrscr();
    printf("Enter any line of text: ");
    gets(st);
```

```
    strrev(st);

    printf("Reverse of the line is: %s",st);
    getch();
}
```

12.3. Write a program that read two line of text and copy second line into first line.

```
#include<stdio.h>
#include<conio.h>
#include<string.h>

void main()
{
    char st1[100],st2[100];

    clrscr();
    printf("Enter first line: ");
    gets(st1);
    printf("Enter second line: ");
    gets(st2);

    strcpy(st1,st2);

    printf("\nAfter strcpy(st1,st2): \n");
    printf("first line: %s\n",st1);
    printf("Second line: %s\n",st2);
    getch();
}
```

12.4. Write a program that read two line of text and add second line with first line.

```
#include<stdio.h>
#include<conio.h>
#include<string.h>
```

```

void main()
{
    char st1[100],st2[100];
    clrscr();
    printf("Enter first line: ");
    gets(st1);
    printf("Enter second line: ");
    gets(st2);

    strcat(st1,st2);

    printf("\nAfter strcat(st1,st2): \n");
    printf("First line: %s\n",st1);
    printf("Second line: %s\n",st2);
    getch();
}

```

12.5. Write a program that compares two strings.

```

#include<stdio.h>
#include<conio.h>
#include<string.h>

void main()
{
    char st1[100],st2[100];
    int n;

    clrscr();
    printf("Enter first line: ");
    gets(st1);
    printf("Enter second line: ");
    gets(st2);

    n=strcmp(st1,st2);

    printf("%d",n);
    getch();
}

```

12.6. Write a program that compares two strings without case sensitivity.

```

#include<stdio.h>
#include<conio.h>
#include<string.h>

void main()
{
    char st1[100],st2[100];
    int n;

    clrscr();
    printf("Enter first line: ");
    gets(st1);
    printf("Enter second line: ");
    gets(st2);

    n=stricmp(st1,st2);

    printf("%d",n);
    getch();
}

```

12.7. Write a program that read a line of text and display in lower case.

```

#include<stdio.h>
#include<conio.h>
#include<string.h>

void main()
{
    char st[100];

    clrscr();
    printf("Enter any line of text: ");
    gets(st);
}

```

```
strlwr(st);

printf("\nAfter strlwr(st): \n");
printf("%s",st);
getch();
```

*2.8. Write a program that read a line of text and display in upper case.

```
#include<stdio.h>
#include<conio.h>
#include<string.h>

void main()
{
    char st[100];

    clrscr();
    printf("Enter any line of text: ");
    gets(st);

   strupr(st);

    printf("\nAfter strupr(st): \n");
    printf("%s",st);
    getch();
```

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13. String

➤ 13.1. Write a program that convert a line to upper case.

```
#include<stdio.h>
#include<conio.h>
#include<string.h>

void main()
{
    char st[100];
    int i,l;

    clrscr();
    printf("Enter any line: ");
    gets(st);

    l=strlen(st);
    for (i=0; i<l; i++)
        if (st[i]>='a' && st[i]<='z')
            printf("%c",st[i]-32);
        else
            printf("%c",st[i]);
    getch();
```

➤ 13.2. Write a program that convert a line to lower case.

```
#include<stdio.h>
#include<conio.h>
#include<string.h>

void main()
{
    char st[100];
    int i,l;
```

```

clrscr();
printf("Enter any line: ");
gets(st);

l=strlen(st);
for (i=0; i<l; i++)
{
    if (st[i]>='A' && st[i]<='Z')
        printf("%c", st[i]+32);
    else
        printf("%c", st[i]);
    getch();
}

```

13.3. Write a program that read your name and display every character with one space.

```

#include<stdio.h>
#include<conio.h>
#include<string.h>

void main()
{
    char st[100];
    int l,i;

    clrscr();
    printf("Enter your name: ");
    gets(st);

    l=strlen(st);

    for (i=0; i<l; i++)
        printf("%c ",st[i]);
    getch();
}

```

13.4. Write a program that read your name and display every character with one space in reverse order.

```

#include<stdio.h>
#include<conio.h>
#include<string.h>

void main()
{
    char st[100];
    int l,i;

    clrscr();
    printf("Enter your name: ");
    gets(st);

    l=strlen(st);

    for (i=l-1; i>=0; i--)
        printf("%c ",st[i]);
    getch();
}

```

13.5. Write a program that read any line of text and display every character in separate line.

```

#include<string.h>
#include<stdio.h>
#include<conio.h>

void main()
{
    char st[100];
    int l,i;

    clrscr();
    printf("Enter any line: ");

```

```
gets(st);
l=strlen(st);
for (i=0; i<l; i++)
printf("\n%c",st[i]);
getch();
```

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13.6. Write a program that read any line of text and display every character with ASCII value in separate line.

```
#include<string.h>
#include<stdio.h>
#include<conio.h>

void main()
{
    char st[100];
    int i,l;

    clrscr();
    printf("Enter any line: ");
    gets(st);

    l=strlen(st);
    for (i=0; i<l; i++)
printf("\n%c %d",st[i],st[i]);
    getch();
}
```

13.7. Write a program that read a line of text and display number of upper case, lower case, digit, space and other character.

```
#include<stdio.h>
#include<conio.h>
#include<string.h>
```

```
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```

```
void main()
{
    char st[100];
    int i,l,upper=0,lower=0,digit=0,space=0,other=0;

    clrscr();
    printf("Enter any line: ");
    gets(st);

    l=strlen(st);
    for (i=0; i<l; i++)
if (st[i]>='a' && st[i]<='z')
lower++;
else if (st[i]>='A' && st[i]<='Z')
upper++;
else if (st[i]>='0' && st[i]<='9')
digit++;
else if (st[i]==' ')
space++;
else
other++;

    printf("\nUpper= %d",upper);
    printf("\nLower= %d",lower);
    printf("\nDigit= %d",digit);
    printf("\nSpace= %d",space);
    printf("\nOther= %d",other);
    getch();
}
```

13.8. Write a program that read a line of text and display number of vowel, consonant, digit, space and other characters.

```
#include<stdio.h>
#include<conio.h>
#include<string.h>

void main()
{
    char st[100];
```

```

int i,l,vowel=0,cons=0,digit=0,space=0,other=0;
clrscr();
printf("Enter any line of Text: ");
gets(st);

l=strlen(st);
for (i=0; i<l; i++)
if (st[i]=='a' || st[i]=='e' || st[i]=='i' ||
    st[i]=='o' || st[i]=='u' ||
    st[i]=='A' || st[i]=='E' || st[i]=='I' ||
    st[i]=='O' || st[i]=='U')
    vowel++;
else if (st[i]>='A' && st[i]<='Z')
    cons++;
else if (st[i]>='a' && st[i]<='z')
    cons++;
else if (st[i]>='0' && st[i]<='9')
    digit++;
else if (st[i]==' ')
    space++;
else
    other++;

printf("\nVowel= %d",vowel);
printf("\nConsonant= %d",cons);
printf("\nDigit= %d",digit);
printf("\nSpace= %d",space);
printf("\nOther= %d",other);
getch();
}

```

13.9. Write a program that read a line of text and display the frequency of every letter.

```

#include<stdio.h>
#include<conio.h>
#include<string.h>
...
void main()
{

```

```

    char st[100];
    int i,l,a[26];

    clrscr();
    printf("Enter any line of Text: ");
    gets(st);

    for (i=0; i<26; i++)
        a[i]=0;

    l=strlen(st);
    for (i=0; i<l; i++)
if (st[i]>='a' && st[i]<='z')
    a[st[i]-97]++;
else if (st[i]>='A' && st[i]<='Z')
    a[st[i]-65]++;

    for (i=0; i<26; i++)
if (a[i]>0)
    printf("\n%c= %d",i+65,a[i]);
    getch();
}

```

13.10. Write a program that read a line of text and display the frequency of every character.

```

#include<stdio.h>
#include<conio.h>
#include<string.h>

void main()
{
    char st[1000];
    int i,l,a[256];

    clrscr();
    printf("Enter any line of Text: ");
    gets(st);

    for (i=0; i<256; i++)

```

```

a[i]=0;
l=strlen(st);
for (i=0; i<l; i++)
a[st[i]]++;

for (i=0; i<256; i++)
if (a[i]>0)
printf("%c=%2d\t", i, a[i]);
getch();
}

```

13.11. Write a program that read and display an array of string.

```

#include<stdio.h>
#include<conio.h>
#include<string.h>

void main()
{
    char st[40][100];
    int i,n;

    clrscr();
    printf("How many line: ");
    scanf("%d\n", &n);

    for (i=0; i<n; i++)
    gets(st[i]);

    for (i=0; i<n; i++)
    printf("\n%s", st[i]);
    getch();
}

```

13.12. Write a program that read an array of string and display in alphabetic order(with case sensitive).

```

#include<stdio.h>
#include<conio.h>
#include<string.h>

```

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Combined By http://fhsnonnet.blogspot.com

```

void main()
{
    char st[40][100],temp[40];
    int i,n,outer,inner;

    clrscr();
    printf("How many word: ");
    scanf("%d\n", &n);

    for (i=0; i<n; i++)
    gets(st[i]);

    for (outer=n-1; outer>=0; outer--)
    for (inner=0; inner<outer; inner++)
    if (strcmp(st[inner],st[inner+1])>0)
    {
        strcpy(temp,st[inner]);
        strcpy(st[inner],st[inner+1]);
        strcpy(st[inner+1],temp);
    }

    for (i=0; i<n; i++)
    printf("\n%s", st[i]);
    getch();
}

```

13.13. Write a program that read an array of string and display in alphabetic order(without case sensitive).

```

#include<stdio.h>
#include<conio.h>
#include<string.h>

void main()
{
    char st[40][100],temp[40];
    int i,n,outer,inner;

    clrscr();
}

```

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```

printf("How many word: ");
scanf("%d\n", &n);
for (i=0; i<n; i++)
    gets(st[i]);
for (outer=n-1; outer>=0; outer--)
    for (inner=0; inner<outer; inner++)
        if (strcmpi(st[inner], st[inner+1])>0)
        {
            strcpy(temp,st[inner]);
            strcpy(st[inner],st[inner+1]);
            strcpy(st[inner+1],temp);
        }
    for (i=0; i<n; i++)
        printf("\n%s",st[i]);
    getch();
}

```

13.14. Write a program that read any binary number and display equivalent decimal number.

```

#include<stdio.h>
#include<conio.h>
#include<string.h>

void main()
{
    char st[100];
    long i,h,l;

    clrscr();
    printf("Enter any binary number: ");
    scanf("%s",st);

    n=0;
    l=strlen(st);
    for (i=0; i<l; i++)
        n=n*2+st[i]-48;
}

```

```

printf("Equivalent decimal number is: %ld",n);
getch();
}

```

13.15. Write a program that read any octal number and display equivalent decimal number.

```

#include<stdio.h>
#include<conio.h>
#include<string.h>

void main()
{
    char st[100];
    long i,n,l;

    clrscr();
    printf("Enter any octal number: ");
    scanf("%s",st);

    n=0;
    l=strlen(st);
    for (i=0; i<l; i++)
        n=n*8+st[i]-48;

    printf("Equivalent decimal number is: %ld",n);
    getch();
}

```

13.16. Write a program that read any hexadecimal number and display equivalent decimal number.

```

#include<stdio.h>
#include<conio.h>
#include<string.h>

void main()

```

```

char s[100];
long i, n;
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clrscr();
printf("Enter any hexadeciaml number: ");
scanf("%s", st);

n=0;
l=strlen(st);
for (i=0; i<l; i++)
if (st[i]>='0' && st[i]<='9')
n=n*16+st[i]-48;
else if (st[i]>='A' && st[i]<='F')
n=n*16+st[i]-55;
else if (st[i]>='a' && st[i]<='f')
n=n*16+st[i]-87;

printf("Equivalent decimal number is: %ld", n);
getch();
}

```

14. File Write

14.1. Write a program that writes 1 to 10 in a file.

```

#include<stdio.h>
#include<conio.h>

void main()
{
    int i;
    FILE *fp;

    fp=fopen("Cse.txt","w");
    for (i=1; i<=10; i++)
        fprintf(fp,"%d",i);
}

```

14.2. Write a program that write the following pyramid in file.

```

1
2   2
3   3   3
4   4   4   4
5   5   5   5   5

```

```

#include<stdio.h>
#include<conio.h>

void main()

{
    int i,j;
    FILE *xt;

    xt=fopen ("Tw02.out","w");
    for (i=1; i<=5; i++)
    {

```

```

    for (j=1; j<=i; j++)
        fprintf(x,"%4d",i);
        fprintf(x,"\\n");
    }
}

```

- 14.3. Write a program that read an array and write in a file.

```

#include<stdio.h>
#include<conio.h>

void main()
{
    int i,n,a[100];
    FILE *fp;

    clrscr();
    fp=fopen("Fw03.out","w");
    printf("How many number: ");
    scanf("%d",&n);

    for (i=0; i<n; i++)
        scanf("%d",&a[i]);

    for (i=0; i<n; i++)
        fprintf(fp,"%4d",a[i]);
}

```

- 14.4. Write a program that read an array and write in a file with ascending order.

```

#include<stdio.h>
#include<conio.h>

void main()
{
    int i,n,a[100],outer,inner,temp;

```

```

FILE *fp;

clrscr();
fp=fopen("Fw04.out","w");
printf("How many number: ");
scanf("%d",&n);

for (i=0; i<n; i++)
    scanf("%d",&a[i]);

for (outer=n-1; outer>=0; outer--)
    for (inner=0; inner<outer; inner++)
        if (a[inner]>a[inner+1])
        {
            temp=a[inner];
            a[inner]=a[inner+1];
            a[inner+1]=temp;
        }

    for (i=0; i<n; i++)
        fprintf(fp,"%4d",a[i]);
}

```

15. File Read

15.1. Write a program that read n numbers from a file and display in output screen.

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int i,n,a[100];
    FILE *fp;

    clrscr();
    fp=fopen("fr01.in","r");
    printf("How many number: ");
    scanf("%d",&n);

    for (i=0; i<n; i++)
        fscanf(fp,"%d",&a[i]);

    for (i=0; i<n; i++)
        printf("%4d",a[i]);
    getch();
}
```

15.2. Write a program that read an array until EOF(end of file).

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int i,n,a[100];
    FILE *fp;
```

```
clrscr();
fp=fopen("fr02.in","r");

n=0;
while(fscanf(fp,"%d",&a[n])!=EOF)
n++;

for (i=0; i<n; i++)
printf("%4d",a[i]);
getch();
}
```

15.3. Write a program that read an array until EOF(end of file).

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int a;
    FILE *fp;

    clrscr();
    fp=fopen("fr03.in","r");

    while(fscanf(fp,"%d",&a)!=EOF)
        printf("%4d",a);

    getch();
}
```

15.4. Write a program that read every character from a file and display in output screen.

```
#include<stdio.h>
#include<conio.h>
```

```

void main()
{
    char a;
    FILE *fp;

    clrscr();
    fp=fopen("fr04.cpp","r");

    while(fscanf(fp,"%c",&a)!=EOF)
        printf("%c",a);
    getch();
}

```

15.5. Write a program that read display content of this file in output screen.

```

#include<stdio.h>
#include<conio.h>

void main()
{
    char a;
    FILE *fp;

    clrscr();
    fp=fopen("fr05.cpp","r");

    while(fscanf(fp,"%c",&a)!=EOF)
        printf("%c",a);
    getch();
}

```

15.6. Write a program that read every character from a file and display in upper case.

```

#include<stdio.h>
#include<conio.h>

```

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```

void main()
{
    char a;
    FILE *fp;

    clrscr();
    fp=fopen("fr06.cpp","r");

    while(fscanf(fp,"%c",&a)!=EOF)
        if (a>='a' && a<='z')
            printf("%c",a-32);
        else
            printf("%c",a);
    getch();
}

```

15.7. Write a program that read every character from a file and display in lower case.

```

#include<stdio.h>
#include<conio.h>

void main()
{
    char a;
    FILE *fp;

    clrscr();
    fp=fopen("fr06.cpp","r");

    while(fscanf(fp,"%c",&a)!=EOF)
        if (a>='A' && a<='Z')
            printf("%c",a+32);
        else
            printf("%c",a);
    getch();
}

```

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15.8. Write a program that count number of lower case, upper case, digit, space, line and other character in a file.

```
#include<stdio.h>
#include<conio.h>

void main()
{
    char ch;
    int
lower=0,upper=0,digit=0,space=0,other=0,line=1;
    FILE *fp;

    clrscr();
    fp=fopen("fr08.cpp","r");

    while(fscanf(fp,"%c",&ch)!=EOF)
        if (ch>='a' && ch<='z')
            lower++;
        else if (ch>='A' && ch<='Z')
            upper++;
        else if (ch>='0' && ch<='9')
            digit++;
        else if (ch=='\n')
            line++;
        else if (ch==' ')
            space++;
        else
            other++;

    printf("Lower= %d\n",lower);
    printf("Upper= %d\n",upper);
    printf("Digit= %d\n",digit);
    printf("Space= %d\n",space);
    printf("Line= %d\n",line);
    printf("Other= %d\n",other);
    getch();
}
```

15.9. Write a program that displays the frequency of every character in a file.

```
#include<stdio.h>
#include<conio.h>

void main()
{
    char ch;
    int a[256],i;
    FILE *fp;

    clrscr();
    for (i=0; i<256; i++)
        a[i]=0;

    fp=fopen("fr09.cpp","r");

    while(fscanf(fp,"%c",&ch)!=EOF)
        a[ch]++;
        for (i=32; i<256; i++)
            if (a[i]>0)
                printf("%c = %d\t",i,a[i]);
    getch();
}
```

16. File Read and Write

- ✓ 16.1. Write a program that read first n numbers in a file and display in another file.

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int i,n,a[100];
    FILE *fp,*fo;

    clrscr();
    fp=fopen("Frw01.in","r");
    fo=fopen("Frw01.out","w");
    printf("How many number: ");
    scanf("%d",&n);

    for (i=0; i<n; i++)
        fscanf(fp,"%d",&a[i]);

    for (i=0; i<n; i++)
        fprintf(fo,"%d",a[i]);
}
```

- ✓ 16.2. Write a program that read all numbers from a file Data.in and display even numbers in Even.out, odd numbers in Odd.out.

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int n;
    FILE *fin,*fe,*fo;

    clrscr();
}
```

```
fin=fopen("Data.in","r");
fe=fopen("Even.out","w");
fo=fopen("Odd.out","w");

while(fscanf(fin,"%d",&n)!=EOF)
{
    if (n%2==0)
        fprintf(fe,"%d",n);
    else
        fprintf(fo,"%d",n);
}
```

- 16.3. Write a program that read all numbers in a file and write another file in descending order.

```
#include<stdio.h>

void main()
{
    int i,n,a[100],inner,outer,temp;
    FILE *fi,*fo;

    fi=fopen("Frw03.in","r");
    fo=fopen("Frw03.out","w");

    n=0;
    while(fscanf(fi,"%d",&a[n])!=EOF)
        n++;

    for (outer=n-1; outer>=0; outer--)
        for (inner=0; inner<outer; inner++)
            if (a[inner]<a[inner+1])
            {
                temp=a[inner];
                a[inner]=a[inner+1];
                a[inner+1]=temp;
            }

    for (i=0; i<n; i++)
        fprintf(fo,"%d",a[i]);
}
```

17. Structure

17.1. Write a program that read and display any students name, roll and mark.

```
#include<stdio.h>
#include<conio.h>

struct student
{
    char name[30];
    int roll,mark;
};

void main()
{
    struct student a;
    clrscr();
    printf("Name: ");
    scanf("%s",a.name);
    printf("Roll: ");
    scanf("%d",&a.roll);
    printf("Mark: ");
    scanf("%d",&a.mark);

    printf("\nName: %s \nRoll: %d \nMark:
    %d",a.name,a.roll,a.mark);
    getch();
}
```

17.2. Write a program that read and display some students name, roll and mark.

```
#include<stdio.h>
#include<conio.h>

struct student
{
    char name[30];
    int roll,mark;
};

void main()
{
    struct student a[100];
    int i,n;
    clrscr();
    printf("How many student: ");
    scanf("%d",&n);

    for (i=0; i<n; i++)
    {
        printf("Name: ");
        scanf("%s",a[i].name);
        printf("Roll: ");
        scanf("%d",&a[i].roll);
        printf("Mark: ");
        scanf("%d",&a[i].mark);
    }

    printf("\nName      Roll      Mark");
    printf("\n-----  ----  -----");
    for (i=0; i<n; i++)
    printf("\n%10s %4d  %4d",
    a[i].name,a[i].roll,a[i].mark);
    getch();
}
```

17.3. Write a program that read some students name, roll and mark from a file and display in screen.

```
#include<stdio.h>
```

```
#include<conio.h>
struct student
{
    char name[30];
    int roll,mark;
};

void main()
{
    struct student a[100];
    int i,n;
    FILE *fi;
    clrscr();
    fi=fopen("J075.in","r");
    n=0;
    while(fscanf(fi,"%s %d %d", a[n].name,
    &a[n].roll, &a[n].mark)!=EOF)
    n++;

    printf("\nName      Roll      Mark");
    printf("\n-----  -----  -----");
    for (i=0; i<n; i++)
    printf("\n%-10s %d %d", a[i].name,
    a[i].roll, a[i].mark);
    getch();
}
```

17.4 Write a program that read some students name, roll and mark from a file, sort and display in screen according to mark.

```
#include<stdio.h>
#include<conio.h>
struct student
{
    char name[30];
    int roll,mark;
};
```

```
void main()
{
    struct student a[100],temp;
    int i,j,n;
    FILE *fi;
    clrscr();
    fi=fopen("J075.in","r");

    n=0;
    while(fscanf(fi,"%s %d %d", &a[n].name,&a[n].roll,&a[n].mark)!=EOF)
    n++;

    for (i=n-1; i>=0; i--)
    for (j=0; j<i; j++)
    if (a[j].mark>a[j+1].mark)
    {
        temp=a[j];
        a[j]=a[j+1];
        a[j+1]=temp;
    }

    printf("\nName      Roll      Mark");
    printf("\n-----  -----  -----");
    for (i=0; i<n; i++)
    printf("\n%-10s %d %d", a[i].name,a[i].roll,a[i].mark);
    getch();
}
```

17.5. Write a program that read some students name, three subjects mark and display name, total, average mark and grade point average.

```
#include<stdio.h>
#include<conio.h>
struct student
{
```

```

char name[20];
int m1,m2,m3,total;
void main()
{
    struct student a[100];
    int i,n;
    FILE *fp;
    clrscr();
    fp=fopen("J077.in","r");
    n=0;
    while(fscanf(fp,"%s %d %d %d", &a[n].name, &a[n].m1, &a[n].m2, &a[n].m3)!=EOF)
    {
        a[n].total=a[n].m1+a[n].m2+a[n].m3;
        n++;
    }

    printf("\nName          Total Average Grade");
    printf("\n~~~~~      ~~~~~ ~~~~~ ~~~~~");
    for (i=0; i<n; i++)
    {
        printf("\n%10s %5d %7.2f
",a[i].name,a[i].total,a[i].total/3.0);
        if (a[i].total/3>=80)
            printf("A+");
        else if (a[i].total/3>=70)
            printf("A");
        else if (a[i].total/3>=60)
            printf("A-");
        else if (a[i].total/3>=50)
            printf("B");
        else if (a[i].total/3>=40)
            printf("C");
        else if (a[i].total/3>=33)
            printf("D");
        else
            printf("F");
    }
}

```

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```

    getch();
}

```

17.6. Write a program that read roll, three subjects mark and display the highest mark in each subjects and highest total with the students roll who obtained this.

```

#include<stdio.h>
#include<conio.h>

struct student
{
    int roll,sub1,sub2,sub3,total;
};

void main()
{
    int i,n,hm1,hm2,hm3,hr1,hr2,hr3,htm,htr;
    struct student a[100];

    clrscr();
    printf("How many student: ");
    scanf("%d",&n);

    for (i=0; i<n; i++)
    {
        printf("Roll: ");
        scanf("%d",&a[i].roll);
        printf("Sub1: ");
        scanf("%d",&a[i].sub1);
        printf("Sub2: ");
        scanf("%d",&a[i].sub2);
        printf("Sub3: ");
        scanf("%d",&a[i].sub3);

        a[i].total=a[i].sub1+a[i].sub2+a[i].sub3;
    }

    printf("\nRoll Total");
    printf("\n~~~~~ ~~~~~");
    for (i=0; i<n; i++)

```

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```

printf("\n%d %d", a[i].roll, a[i].total);
hml=a[0].sub1;
hrl=a[0].roll;
hm2=a[0].sub2;
hr2=a[0].roll;
hm3=a[0].sub3;
hr3=a[0].roll;

htm=a[0].total;
htr=a[0].roll;

for (i=1; i<n; i++)
{
    if (a[i].sub1>hml)
    {
        hml=a[i].sub1;
        hrl=a[i].roll;
    }
    if (a[i].sub2>hm2)
    {
        hm2=a[i].sub2;
        hr2=a[i].roll;
    }
    if (a[i].sub3>hm3)
    {
        hm3=a[i].sub3;
        hr3=a[i].roll;
    }
    if (a[i].total>htm)
    {
        htm=a[i].total;
        htr=a[i].roll;
    }
}
printf("\nSub1 Highest mark= %d Roll= %d",
hml, hrl);
printf("\nSub2 Highest mark= %d Roll= %d",
hm2, hr2);
printf("\nSub3 Highest mark= %d Roll= %d",
hm3, hr3);

```

```

printf("\n\nHighest total mark is %d obtained by
roll %d.", htm, htr);
getch();
}

```

17.7. Write a program that read some players name, team name and batting average. Display this according to team name.

```

struct cricket
{
    char player[30], team[30], avg[10];
};

void main()
{
    int i, n, outer, inner;
    struct cricket a[12], temp;

    clrscr();
    printf("How many player: ");
    scanf("%d", &n);

    for (i=0; i<n; i++)
    {
        printf("Player name: ");
        scanf("%s", a[i].player);
        printf("Team name: ");
        scanf("%s", a[i].team);
        printf("Batting average: ");
        scanf("%s", a[i].avg);
    }

    for (outer=n-1; outer>0; outer--)
    for (inner=0; inner<outer; inner++)
    if (strcmp(a[inner].team, a[inner+1].team)>0)
    {
        temp=a[inner];
        a[inner]=a[inner+1];
        a[inner+1]=temp;
    }
}

```

```

printf("\nPlayer name      Team name      Average");
printf("\n-----      -----      -----");
for (i=0; i<n; i++)
{
    printf("\n%11s %12s %12s", a[i].player, a[i].team, a[i].avg);
    getch();
}

```

17.8. A file contains some persons name and telephone numbers. Write a program perform the following task:

- Read telephone number and display name.
- Read name and display telephone number.

```

#include<stdio.h>
#include<conio.h>
#include<string.h>

struct tnt
{
    char name[20];
    long phone;
};

void main()
{
    int i,n;
    long p;
    char na[20];
    struct tnt a[100];
    FILE *fp;

    clrscr();
    fp=fopen("J098.in","r");
    n=0;

```

```

while(fscanf(fp,"%ld",&a[n].name,&a[n].phone)!=EOF)
{
    n++;
    printf("Telephone number: ");
    scanf("%ld",&p);
    for (i=0; i<n; i++)
        if (a[i].phone==p)
            printf("%s",a[i].name);

    printf("\nName: ");
    scanf("%s",na);
    for (i=0; i<n; i++)
        if (strcmp(a[i].name,na)==0)
            printf("%ld",a[i].phone);

    getch();
}

```

17.9. A file contains some country name and capital. Write a program that repeatedly read any country name and display capital until user enters the word "End".

```

#include<stdio.h>
#include<conio.h>
#include<string.h>

struct desh
{
    char name[20],capital[20];
};

void main()
{
    int i,n;
    struct desh a[100];
    FILE *fp;
    char st[20];

```

```

clrscr();
fp=fopen("J114.in","r");

n=0;
while(fscanf(fp,"%s
%s",&a[n].name,&a[n].capital)!=EOF)
n++;

for (i++)
{
    printf("\nEnter Country name: ");
    scanf("%s",st);

    if (strcmpi(st,"End")==0)
    break;

    for (i=0; i<n; i++)
    if (strcmpi(a[i].name,st)==0)
    printf("Capital: %s",a[i].capital);
}

```

17.10. A file contains some hotels name, address, grade, charge and number of rooms. Write a program that performs the following task.

- Display all hotels information with given grade.
- Display all hotels information whose charge is less than given charge.

```

#include<stdio.h>
#include<conio.h>

struct hotel
{
    char name[30],add[30];
    int grade,charge,num_room;
};

void main()

```

```

int i,j,g,n,value;
struct hotel a[100],temp;
FILE *fp;

clrscr();
fp=fopen("J123.in","r");

n=0;
while(fscanf(fp,"%s %s %d %d
%d",&a[n].name,&a[n].add,&a[n].grade,
&a[n].charge,&a[n].num_room)!=EOF)
n++;

for (i=n-1; i>0; i--)
for (j=0; j<i; j++)
if (a[j].charge>a[j+1].charge)
{
    temp=a[j];
    a[j]=a[j+1];
    a[j+1]=temp;
}

printf("\nEnter any grade: ");
scanf("%d",&g);

printf("\nName           Address     Grade Charge
Num_Room");
printf("\n~~~~~      ~~~~~      ~~~~~
~~~~~");
for (i=0; i<n; i++)
if (a[i].grade==g)
printf("\n%10s %10s %5d %6d
%5d",a[i].name,a[i].add,a[i].grade,
a[i].charge,a[i].num_room);

printf("\n\nEnter any value: ");
scanf("%d",&value);

printf("\nName           Address     Grade Charge
Num_Room");

```

```

printf("\n~~~~~");
for (i=0; i<n; i++)
if (a[i].charge<=value)
printf("\n%10s %10s %5d %6d
%5d", a[i].name, a[i].add, a[i].grade,
a[i].charge, a[i].num_room);
getch();
}

```

17.J1. Write a program that read some players name, team name, batting average and display team wise player information.

```

#include<stdio.h>
#include<conio.h>
#include<string.h>

struct cricket
{
    char player[30], team[30], avg[10];
};

void main()
{
    int i, n, outer, inner;
    struct cricket a[12], temp;
    char st[30];

    clrscr();
    printf("How many player: ");
    scanf("%d", &n);

    for (i=0; i<n; i++)
    {
        printf("Player name: ");
        scanf("%s", a[i].player);
        printf("Team name: ");
        scanf("%s", a[i].team);
        printf("Batting average: ");

```

```

scanf("%s", a[i].avg);
}

for (outer=n-1; outer>0; outer--)
for (inner=0; inner<outer; inner++)
if (strcmp(a[inner].team, a[inner+1].team)>0)
{
    temp=a[inner];
    a[inner]=a[inner+1];
    a[inner+1]=temp;
}

printf("\nPlayer name      Average");
printf("\n~~~~~");
i=0;
strcpy(st, "");
while(i<n)
{
    if (strcmp(st, a[i].team)!=0)
    {
        printf("\n%11s", a[i].team);
        printf("\n~~~~~");
        strcpy(st, a[i].team);
    }
    else
    {
        printf("\n%11s
%7s", a[i].player, a[i].avg);
        i++;
    }
}
getch();
}

```

18. Function

18.1. Write a function that gets two integers and returns sum.

```
#include<stdio.h>
#include<conio.h>

int Sum(int a, int b)
{
    int c;
    c=a+b;
    return c;
}

void main()
{
    int x,y,s;
    clrscr();
    printf("Enter first number: ");
    scanf("%d",&x);
    printf("Enter second number: ");
    scanf("%d",&y);

    s=Sum(x,y);

    printf("Sum of %d and %d is %d",x,y,s);
    getch();
}
```

Combined By <http://lhsnnet.blogspot.com>

18.2. Write a function that gets two integers and returns sum.

```
#include<stdio.h>
#include<conio.h>

int Sum(int a, int b)
{
    return a+b;
}

void main()
{
    int x,y;
    clrscr();
    printf("Enter first number: ");
    scanf("%d",&x);

    printf("Enter second number: ");
    scanf("%d",&y);

    printf("Sum of %d and %d is %d",x,y,Sum(x,y));
    getch();
}
```

18.3. Write a function that gets two integers and returns division.

```
#include<stdio.h>
#include<conio.h>

float Sum(int a, int b)
{
    return (float)a/b;
}

void main()
{
    int x,y;
```

```

clrscr();
printf("Enter first number: ");
scanf("%d",&x);
printf("Enter second number: ");
scanf("%d",&y);

printf("Sum of %d and %d is %f",x,y,Sum(x,y));
getch();
}

```

18.4. Write a function that gets two integers and returns maximum.

```

#include<stdio.h>
#include<conio.h>

int Max(int a, int b)
{
    if (a>b)
        return a;
    else
        return b;
}

void main()
{
    int x,y;

    clrscr();
    printf("Enter first number: ");
    scanf("%d",&x);
    printf("Enter second number: ");
    scanf("%d",&y);

    printf("Maximum= %d",Max(x,y));
    getch();
}

```

18.5. Write a function that gets two integers and returns minimum.

```

#include<stdio.h>
#include<conio.h>

int Min(int a, int b)
{
    if (a<b)
        return a;
    else
        return b;
}

void main()
{
    int x,y;

    clrscr();
    printf("Enter first number: ");
    scanf("%d",&x);
    printf("Enter second number: ");
    scanf("%d",&y);

    printf("Minimum= %d",Min(x,y));
    getch();
}

```

18.6. Write a function that gets length and width of a rectangle and returns area.

```

#include<stdio.h>
#include<conio.h>

long RectArea(int l, int w)
{
    return (long)l*w;
}

void main()
{
}

```

```

int length,width;
clrscr();
printf("Length= ");
scanf("%d",&length);
printf("Width= ");
scanf("%d",&width);

printf("Area= %d",RectArea(length,width));
getch();
}

18.7. Write a function that gets radius of a circle and returns
area.

* #include<stdio.h>
#include<conio.h>
#include<math.h>

float Area(float r)
{
    return M_PI*r*r;
}

void main()
{
    float radius;
    clrscr();
    printf("Radius= ");
    scanf("%f",&radius);

    printf("Area= %f",Area(radius));
    getch();
}

```

18.8. Write a function that gets three numbers and returns maximum.

```

#include<stdio.h>
#include<conio.h>
int Max(int a, int b, int c)
{
    if (a>b)
    {
        if (a>c)
            return a;
        else
            return c;
    }
    else
    {
        if (b>c)
            return b;
        else
            return c;
    }
}

void main()
{
    int a,b,c;
    clrscr();
    printf("a= ");
    scanf("%d",&a);
    printf("b= ");
    scanf("%d",&b);
    printf("c= ");
    scanf("%d",&c);

    printf("Maximum= %d",Max(a,b,c));
    getch();
}

```

18.9. Write a function that gets three numbers and returns minimum.

```
#include<stdio.h>
#include<conio.h>

int Min(int a, int b, int c)
{
    if (a
        {
            if (a<c)
                return a;
            else
                return c;
        }
    else
        {
            if (b<c)
                return b;
            else
                return c;
        }
    }

void main()
{
    int a,b,c;

    clrscr();
    printf("a= ");
    scanf("%d",&a);
    printf("b= ");
    scanf("%d",&b);
    printf("c= ");
    scanf("%d",&c);

    printf("Minimum= %d",Min(a,b,c));
    getch();
}

```

18.10. Write a function that gets three numbers and returns medium.

```
#include<stdio.h>
#include<conio.h>

int Mid(int a, int b, int c)
{
    if (a>b)
        {
            if (a>c)
                return a;
            else
                return c;
        }
    else
        {
            if (b>c)
                return b;
            else
                return c;
        }
}

void main()
{
    int a,b,c;

    clrscr();
    printf("a= ");
    scanf("%d",&a);
    printf("b= ");
    scanf("%d",&b);
    printf("c= ");
    scanf("%d",&c);

    printf("Medium= %d",Mid(a,b,c));
    getch();
}
```

```

printf("b= ");
scanf("%d",&b);
printf("c= ");
scanf("%d",&c);

printf("Medium= %d",Mid(a,b,c));
getch();
}

```

18.11. Write a function that gets any positive integer and returns its factorial.

```

#include<stdio.h>
#include<conio.h>

long Fact(int n)
{
    int i;
    long fact=1;

    for (i=1; i<=n; i++)
        fact=fact*i;

    return fact;
}

void main()
{
    int n;

    clrscr();
    printf("Enter any positive integer: ");
    scanf("%d",&n);

    printf("Factorial = %d",n,Fact(n));
    getch();
}

```

18.12. Write a function that gets any positive integer and returns its digital sum.

```

#include<stdio.h>
#include<conio.h>

int Sum(int n)
{
    int s=0;
    while(n>0)
    {
        s=s+n%10;
        n=n/10;
    }

    return s;
}

void main()
{
    int n;

    clrscr();
    printf("Enter any positive integer: ");
    scanf("%d",&n);

    printf("Digital sum= %d",Sum(n));
    getch();
}

```

18.13. Write a function that gets any positive integer and returns digital root.

```

#include<stdio.h>
#include<conio.h>

int Sum(int n)

```

```

{
    int s=0;
    while(n>0)
    {
        s=s+n%10;
        n=n/10;
    }
    return s;
}

int Root(int n)
{
    while(n>9)
        n=Sum(n);
    return n;
}

void main()
{
    int n;
    clrscr();
    printf("Enter positive integer: ");
    scanf("%d",&n);
    printf("Digital root= %d",Root(n));
    getch();
}

```

18.14. Write a function that gets any positive integer and returns its reverse.

```

#include<stdio.h>
#include<conio.h>

int Reverse(int n)
{
    int r=0;

```

```

    while(n>0)
    {
        r=r*10+n%10;
        n=n/10;
    }
    return r;
}

void main()
{
    int n;
    clrscr();
    printf("Enter any positive integer: ");
    scanf("%d",&n);
    printf("Reverse of %d= %d",n,Reverse(n));
    getch();
}

```

18.15. Write a function that gets two positive integer and returns GCD (greatest common divisor).

```

#include<stdio.h>
#include<conio.h>

int Gcd(int a, int b)
{
    int c;
    while(a!=b)
    {
        c=a+b;
        a=b;
        b=c;
    }
    return b;
}

```

```

}

void main()
{
    int a,b;

    clrscr();
    printf("Enter a= ");
    scanf("%d",&a);
    printf("Enter b= ");
    scanf("%d",&b);

    printf("GCD= %d",Gcd(a,b));
    getch();
}

```

//18.)6. Write a function that gets two positive integers and returns LCM (least common multiple).

```

#include<stdio.h>
#include<conio.h>

int Lcm(int a, int b)
{
    int i,l=1;

    for (i=2; i<=a && i<=b; i++)
        while(a%i==0 && b%i==0)

    {
        a=a/i;
        b=b/i;
        l=i*i;
    }
    l=l*a*b;

    return l;
}

```

```

void main()
{
    int a,b;

    clrscr();
    printf("a= ");
    scanf("%d",&a);
    printf("b= ");
    scanf("%d",&b);

    printf("LCM= %d",Lcm(a,b));
    getch();
}

```

18.17. Write a function that gets two positive integers(a, b) and returns a to the power b.

```

#include<stdio.h>
#include<conio.h>

long Power(int a, int b)
{
    long p=1;
    int i;

    for (i=1; i<=b; i++)
        p=p*a;

    return p;
}

void main()
{
    int a,b;

    clrscr();
    printf("a= ");
    scanf("%d",&a);
    printf("b= ");

```

```

scanf("%d", &b);
printf("%d to the power %d= %d", a, b, Power(a, b));
getch();
}

```

Ashraf

~~18.18.~~ Write a function that gets two positive integers and returns nPr (Permutation).

```

#include<stdio.h>
#include<conio.h>

long nPr(int n, int r)
{
    long p;
    int i;

    for (p=1, i=r+1; i<=n; p=p*i++);
}

void main()
{
    int n,r;

    clrscr();
    printf("n= ");
    scanf("%d", &n);
    printf("r= ");
    scanf("%d", &r);

    printf("nPr= %ld", nPr(n,r));
    getch();
}

```

Combined By <http://lhsnet.blogspot.com>

~~18.19.~~ Write a function that gets two positive integers and returns nCr (Combination).

```

#include<stdio.h>
#include<conio.h>

long nCr(int n, int r)
{
    long p;
    int i;

    if (n-r<r)
        r=n-r;

    p=1;
    for (i=1; i<=r; p=p*(n-i+1)/i, i++);
}

void main()
{
    int n,r;

    clrscr();
    printf("n= ");
    scanf("%d", &n);
    printf("r= ");
    scanf("%d", &r);

    printf("nCr= %ld", nCr(n,r));
    getch();
}

```

~~18.20.~~ Write a function that gets any positive integer and determine prime or not prime.

```

#include<stdio.h>
#include<conio.h>
#include<math.h>

```

```

int isprime(long n)
{
    int i,t;
    if (n<2)
        return 0;
    t=sqrt(n);
    for (i=2; i<=t; i++)
        if (n%i==0)
            return 0;
    return 1;
}

void main()
{
    long n;
    clrscr();
    printf("Enter any positive integer: ");
    scanf("%ld",&n);

    if (isprime(n)==1)
        printf("Prime");
    else
        printf("Not prime");
    getch();
}

```

18.21. Write a function that gets an array and returns sum.

```

#include<stdio.h>
#include<conio.h>

int Sum(int a[], int n)
{
    int sum=0,i;
    for (i=0; i<n; i++)

```

```

    sum=sum+a[i];
}

void main()
{
    int i,n,a[100];
    clrscr();
    printf("How many numbers: ");
    scanf("%d",&n);

    for (i=0; i<n; i++)
        scanf("%d",&a[i]);

    printf("Sum= %d",Sum(a,n));
    getch();
}

```

18.22. Write a function that gets an array and returns average.

```

#include<stdio.h>
#include<conio.h>

float Avg(int a[], int n)
{
    int sum=0,i;
    for (i=0; i<n; i++)
        sum=sum+a[i];

    return (float)sum/n;
}

void main()
{
    int i,n,a[100];
    clrscr();
    printf("How many numbers: ");

```

```

scanf("%d", &n);
for (i=0; i<n; i++)
scanf("%d", &a[i]);
printf("Average= %f", Avg(a, n));
getch();
}

```

18.23. Write a function that gets an array and returns maximum.

```

#include<stdio.h>
#include<conio.h>
int Max(int a[], int n)
{
    int i, max;

    max=a[0];
    for (i=1; i<n; i++)
    if (a[i]>max)
    max=a[i];

    return max;
}

void main()
{
    int i, n, a[100];

    clrscr();
    printf("How many numbers: ");
    scanf("%d", &n);

    for (i=0; i<n; i++)
    scanf("%d", &a[i]);

    printf("Maximum= %d", Max(a, n));
    getch();
}

```

18.24. Write a function that gets an array and returns minimum.

```

#include<stdio.h>
#include<conio.h>

int Min(int a[], int n)
{
    int i, min;

    min=a[0];
    for (i=1; i<n; i++)
    if (a[i]<min)
    min=a[i];

    return min;
}

void main()
{
    int i, n, a[100];

    clrscr();
    printf("How many numbers: ");
    scanf("%d", &n);

    for (i=0; i<n; i++)
    scanf("%d", &a[i]);

    printf("Minimum= %d", Min(a, n));
    getch();
}

```

18.25. Write a function that searches any number in an array.

```

#include<stdio.h>
#include<conio.h>

int Search(int a[], int n, int item)
{

```

```

int i;
for (i=0; i<n; i++)
if (a[i]==item)
return 1;
return 0;
}

void main()
{
int i,n,a[100],item;
clrscr();
printf("How many numbers: ");
scanf("%d",&n);
for (i=0; i<n; i++)
scanf("%d",&a[i]);
printf("Enter any number to search: ");
scanf("%d",&item);

if (Search(a,n,item)==1)
printf("Found");
else
printf("Not found");

getch();
}

```

18.26. Write a function that sorts an array.

```

#include<stdio.h>
#include<conio.h>

void Sort(int a[], int n)
{
int i,j,temp;

```

```

for (i=n-1; i>0; i--)
for (j=0; j<i; j++)
if (a[j]>a[j+1])
{
temp=a[j];
a[j]=a[j+1];
a[j+1]=temp;
}
}

void main()
{
int i,n,a[100];
clrscr();
printf("How many numbers: ");
scanf("%d",&n);
for (i=0; i<n; i++)
scanf("%d",&a[i]);
Sort(a,n);
for (i=0; i<n; i++)
printf("%4d",a[i]);
getch();
}

```

18.27. Write a function that gets a string and returns its length.

```

#include<stdio.h>
#include<conio.h>

int Strlen(char st[])
{
int l;
for (l=0; st[l]; l++);
return l;
}

```

```

void main()
{
    char st[100];

    clrscr();
    printf("Enter any line of text: ");
    gets(st);

    printf("Length= %d", Strlen(st));
    getch();
}

```

18.28. Write a function that gets a string and reverses all characters.

```

#include<stdio.h>
#include<conio.h>

void Strrev(char st[])
{
    int i,l;
    char temp;

    for (l=0; st[l]; l++);

    for (i=0; i<l/2; i++)
    {
        temp=st[i];
        st[i]=st[l-i-1];
        st[l-i-1]=temp;
    }
}

void main()
{
    char st[100];

    clrscr();
    printf("Enter any line of text: ");

```

Ashraf

```

    gets(st);

    Strrev(st);

    printf("Reverse of the line is: %s",st);
    getch();
}

```

18.29. Write a function that gets a string and convert it to upper case.

```

#include<stdio.h>
#include<conio.h>

void Upper(char st[])
{
    int i;

    for (i=0; st[i]; i++)
        if (st[i]>='a' && st[i]<='z')
            st[i]=st[i]-32;
}

void main()
{
    char st[100];

    clrscr();
    printf("Enter any line of text: ");
    gets(st);

    Upper(st);
    printf("%s",st);
    getch();
}

```

18.30. Write a function that gets a string and convert it to lower case.

```
#include<stdio.h>
#include<conio.h>

void Lower(char st[])
{
    int i;
    for (i=0; st[i]; i++)
        if (st[i]>='A' && st[i]<='Z')
            st[i]=st[i]+32;
}

void main()
{
    char st[100];
    clrscr();
    printf("Enter any line of text: ");
    gets(st);
    Lower(st);
    printf("\n%s",st);
    getch();
}
```

18.31. Write a function that copies one string over another string.

```
#include<stdio.h>
#include<conio.h>

void Copy(char st1[], char st2[])
{
    int i;
```

```
for (i=0; st2[i]; i++)
    st1[i]=st2[i];
st1[i]=0;
}

void main()
{
    char st1[100],st2[100];
    clrscr();
    printf("Enter first string: ");
    scanf("%s",st1);
    printf("Enter second string: ");
    scanf("%s",st2);
    Copy(st1,st2);
    printf("\nFirst string is: %s",st1);
    printf("\nSecond string is: %s",st2);
    getch();
}
```

19. Recursive Function

19.1. Write a recursive function that gets any positive integer and returns factorial.

```
#include<stdio.h>
#include<conio.h>

long Fact(int n)
{
    if (n==0)
        return 1;

    return (long)n*Fact(n-1);
}

void main()
{
    int n;

    clrscr();
    printf("Enter any positive integer: ");
    scanf("%d",&n);

    printf("\n%d!= %ld",n,Fact(n));
    getch();
}
```

Ex
19.2. Write a recursive function that returns n'th Fibonacci number.

```
#include<stdio.h>
#include<conio.h>

long Fibo(int n)
{
    if (n==0)
        return 0;
    if (n==1)
        return 1;

    return Fibo(n-1)+Fibo(n-2);
}

void main()
{
    int n;

    clrscr();
    printf("Enter any positive integer: ");
    scanf("%d",&n);

    printf("\n%d'th Fibonacci number is\n%d",n,Fibo(n));
    getch();
}
```

20. Pointer

20.1. Write a program that reads and displays any number.

```
#include<stdio.h>
#include<conio.h>
#include<stdlib.h>

void main()
{
    int *n;

    clrscr();
    n=(int *)malloc(sizeof(int));

    printf("Enter any number: ");
    scanf("%d",n);

    printf("The number is %d",*n);
    getch();
}
```

20.2. Write a program that reads two numbers and display sum.

```
#include<stdio.h>
#include<conio.h>
#include<stdlib.h>

void main()
{
    int *a,*b,*sum;

    a=(int *)malloc(sizeof(int));
    b=(int *)malloc(sizeof(int));
    sum=(int *)malloc(sizeof(int));
}
```

Combined By <http://lhsonnet.blogspot.com>

```
b=(int *)malloc(sizeof(int));
sum=(int *)malloc(sizeof(int));

clrscr();
printf("a= ");
scanf("%d",a);
printf("b= ");
scanf("%d",b);

*a=*a+*b;           // *sum=(*a)+(*b);

printf("Sum= %d",*sum);
getch();
}
```

20.3. Write a program that reads and subtracts two numbers.

```
#include<stdio.h>
#include<conio.h>
#include<stdlib.h>

void main()
{
    int *a,*b,*sub;

    a=(int *)malloc(sizeof(int));
    b=(int *)malloc(sizeof(int));
    sub=(int *)malloc(sizeof(int));

    clrscr();
    printf("a= ");
    scanf("%d",a);
    printf("b= ");
    scanf("%d",b);

    *sub=*a-*b;

    printf("%d-%d= %d",*a,*b,*sub);
    getch();
}
```

20. Pointer

20.1. Write a program that reads and displays any number.

```
#include<stdio.h>
#include<conio.h>
#include<stdlib.h>

void main()
{
    int *n;

    clrscr();
    n=(int *)malloc(sizeof(int));
    printf("Enter any number: ");
    scanf("%d",n);

    printf("The number is %d",*n);
    getch();
}
```

20.2. Write a program that reads two numbers and display sum.

```
#include<stdio.h>
#include<conio.h>
#include<stdlib.h>

void main()
{
    int *a,*b,*sum;
    a=(int *)malloc(sizeof(int));
    b=(int *)malloc(sizeof(int));
    sum=(int *)malloc(sizeof(int));
```

```
b=(int *)malloc(sizeof(int));
sum=(int *)malloc(sizeof(int));

clrscr();
printf("a= ");
scanf("%d",a);
printf("b= ");
scanf("%d",b);

*sum=*a+*b;           // *sum=(*a)+(*b)

printf("Sum= %d",*sum);
getch();
}
```

20.3. Write a program that reads and subtracts two numbers.

```
#include<stdio.h>
#include<conio.h>
#include<stdlib.h>

void main()
{
    int *a,*b,*sub;

    a=(int *)malloc(sizeof(int));
    b=(int *)malloc(sizeof(int));
    sub=(int *)malloc(sizeof(int));

    clrscr();
    printf("a= ");
    scanf("%d",a);
    printf("b= ");
    scanf("%d",b);

    *sub=*a-*b;

    printf("%d-%d= %d",*a,*b,*sub);
    getch();
}
```

20.4. Write a program that reads and multiplies two numbers.

```
#include<stdio.h>
#include<conio.h>
#include<stdlib.h>

void main()
{
    int *a, *b, *mul;
    a=(int *)malloc(sizeof(int));
    b=(int *)malloc(sizeof(int));
    mul=(int *)malloc(sizeof(int));
    clrscr();
    printf("a= ");
    scanf("%d", a);
    printf("b= ");
    scanf("%d", b);
    *mul=*a**b;
    printf("%d*%d= %d", *a, *b, *mul);
    getch();
}
```

20.5. Write a program that reads two numbers and displays division.

```
#include<stdio.h>
#include<conio.h>
#include<stdlib.h>

void main()
{
    int *a, *b, *c;
    a=(int *)malloc(sizeof(int));
    b=(int *)malloc(sizeof(int));
    c=(int *)malloc(sizeof(int));
}
```

```
clrscr();
printf("a= ");
scanf("%d", a);
printf("b= ");
scanf("%d", b);
*c=*a/(*b);
printf("%d/%d= %d", *a, *b, *c);
getch();
}
```

20.6. Write a program that reads two numbers and displays division.

```
#include<stdio.h>
#include<conio.h>
#include<stdlib.h>

void main()
{
    int *a, *b;
    float *c;
    a=(int *)malloc(sizeof(int));
    b=(int *)malloc(sizeof(int));
    c=(float *)malloc(sizeof(float));
    clrscr();
    printf("a= ");
    scanf("%d", a);
    printf("b= ");
    scanf("%d", b);
    *c=(float)*a/(*b);
    printf("%d/%d= %f", *a, *b, *c);
    getch();
}
```

20.7. Write a program that reads two numbers and displays remainder.

```
#include<stdio.h>
#include<conio.h>
#include<stdlib.h>

void main()
{
    int *a,*b,*c;

    a=(int *)malloc(sizeof(int));
    b=(int *)malloc(sizeof(int));
    c=(int *)malloc(sizeof(int));

    clrscr();
    printf("a= ");
    scanf("%d",a);
    printf("b= ");
    scanf("%d",b);

    *c=*a%*b;

    printf("Remainder= %d",*c);
    getch();
}
```

20.8. Write a program that reads two numbers and display maximum.

```
#include<stdio.h>
#include<conio.h>
#include<stdlib.h>

void main()
{
    int *a,*b,*max;
    a=(int *)malloc(sizeof(int));
```

```
b=(int *)malloc(sizeof(int));

clrscr();
printf("a= ");
scanf("%d",a);
printf("b= ");
scanf("%d",b);

if (*a>*b)
    max=a;
else
    max=b;

printf("Maximum= %d",*max);
getch();
}
```

20.9. Write a program that reads two numbers and display minimum.

```
#include<stdio.h>
#include<conio.h>
#include<stdlib.h>

void main()
{
    int *a,*b,*min;
    a=(int *)malloc(sizeof(int));
    b=(int *)malloc(sizeof(int));

    clrscr();
    printf("a= ");
    scanf("%d",a);
    printf("b= ");
    scanf("%d",b);

    if (*a<*b)
        min=a;
    else
        min=b;
```

```
printf("Minimum= %d", *min);
getch();
```

20.10. Write a program that reads three numbers and display maximum.

```
#include<stdio.h>
#include<conio.h>
#include<stdlib.h>

void main()
{
    int *a, *b, *c, *max;

    a=(int *)malloc(sizeof(int));
    b=(int *)malloc(sizeof(int));
    c=(int *)malloc(sizeof(int));

    clrscr();
    printf("a= ");
    scanf("%d",a);
    printf("b= ");
    scanf("%d",b);
    printf("c= ");
    scanf("%d",c);

    if (*a>*b)
    {
        if (*a>*c)
            max=a;
        else
            max=c;
    }
    else
    {
        if (*b>*c)
            max=b;
        else
            max=c;
    }

    printf("Maximum= %d", *max);
    getch();
```

```
    max=c;
}

printf("Maximum= %d", *max);
getch();
```

20.11. Write a program that reads three numbers and display minimum.

```
#include<stdio.h>
#include<conio.h>
#include<stdlib.h>

void main()
{
    int *a, *b, *c, *min;

    a=(int *)malloc(sizeof(int));
    b=(int *)malloc(sizeof(int));
    c=(int *)malloc(sizeof(int));

    clrscr();
    printf("a= ");
    scanf("%d",a);
    printf("b= ");
    scanf("%d",b);
    printf("c= ");
    scanf("%d",c);

    if (*a<*b)
    {
        if (*a<*c)
            min=a;
        else
            min=c;
    }
    else
    {
        if (*b<*c)
```

```

        min=b;
    else
        min=c;
}

printf("Minimum= %d",min);
getch();
}

```

20.12. Write a program that reads three numbers and display medium.

```

#include<stdio.h>
#include<conio.h>
#include<stdlib.h>

void main()
{
    int *a,*b,*c,*mid;

    a=(int *)malloc(sizeof(int));
    b=(int *)malloc(sizeof(int));
    c=(int *)malloc(sizeof(int));

    clrscr();
    printf("a= ");
    scanf("%d",a);
    printf("b= ");
    scanf("%d",b);
    printf("c= ");
    scanf("%d",c);

    if (*a>*b)
    {
        if (*a>*c)
        {
            if (*b>*c)
                mid=b;
            else
                mid=c;
        }
        else
            mid=a;
    }
    else
    {
        if (*b>*c)
        {
            if (*a>*c)
                mid=a;
            else
                mid=c;
        }
        else
            mid=b;
    }

    printf("Midium= %d",*mid);
    getch();
}

```

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20.13. Write a program that reads two floating point numbers and display maximum.

```

#include<stdio.h>
#include<conio.h>
#include<stdlib.h>

void main()
{
    float *a,*b,*c;

    clrscr();
    a=(float *)malloc(sizeof(float));
    b=(float *)malloc(sizeof(float));

    printf("a= ");
    scanf("%f",a);
    printf("b= ");
    scanf("%f",b);

```

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```

if (*a>*b)
    c=*a;
else
    c=*b;

printf("Maximum= %f", *c);
getch();
}

```

20.14. Write a program that reads two long numbers and display maximum.

```

#include<stdio.h>
#include<conio.h>
#include<stdlib.h>

void main()
{
    long *a,*b,*max;

    clrscr();
    a=(long *)malloc(sizeof(long));
    b=(long *)malloc(sizeof(long));

    printf("a= ");
    scanf("%ld",a);
    printf("b= ");
    scanf("%ld",b);

    if (*a>*b)
        max=a;
    else
        max=b;

    printf("Maximum= %ld",*max);
    getch();
}

```

20.15. Write a program that reads two double value and display maximum.

```

#include<stdio.h>
#include<conio.h>
#include<stdlib.h>

void main()
{
    double *a,*b,*max;

    clrscr();
    a=(double *)malloc(sizeof(double));
    b=(double *)malloc(sizeof(double));

    printf("a= ");
    scanf("%lf",a);
    printf("b= ");
    scanf("%lf",b);

    if (*a>*b)
        max=a;
    else
        max=b;

    printf("Maximum= %lf",*max);
    getch();
}

```

20.16. Write a program that reads two characters and display maximum.

```

#include<stdio.h>
#include<conio.h>
#include<stdlib.h>

void main()
{
}

```

```

char *a,*b,*max;
a=(char *)malloc(sizeof(char));
b=(char *)malloc(sizeof(char));
clrscr();
printf("Enter first character: ");
scanf("%c%c",a);
printf("Enter second character: ");
scanf("%c%c",b);

if (*a>*b)
max=a;
else
max=b;

printf("Maximum= %c",*max);
getch();
}

```

20.17. Write a program that reads two string and display maximum.

```

#include<stdio.h>
#include<conio.h>
#include<string.h>
#include<stdlib.h>

void main()
{
    char *a,*b,*max;

    a=(char *)malloc(sizeof(char)*30);
    b=(char *)malloc(sizeof(char)*30);

    clrscr();
    printf("Enter first string: ");
    scanf("%s",a);
    printf("Enter second string: ");
    scanf("%s",b);
}

```

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```

if (strcmp(a,b)>0)
strcpy(max,a);
else
strcpy(max,b);

printf("Maximum= %s",max);
getch();
}

```

20.18. Write a program that reads any integer and display positive, negative or zero.

```

#include<stdio.h>
#include<conio.h>
#include<stdlib.h>

void main()
{
    int *n;

    n=(int *)malloc(sizeof(int));

    clrscr();
    printf("Enter any integer number: ");
    scanf("%d",n);

    if (*n>0)
        printf("Positive");
    else if (*n<0)
        printf("Negative");
    else
        printf("Zero");
    getch();
}

```

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20.19. Write a program that read a digit and display by spelling.

```
#include<stdio.h>
#include<conio.h>
#include<stdlib.h>

void main()
{
    int *n;

    n=(int *)malloc(sizeof(int));
    clrscr();
    printf("Enter any digit: ");
    scanf("%d",n);

    switch(*n)
    {
        case 0:
            printf("Zero");
            break;
        case 1:
            printf("One");
            break;
        case 2:
            printf("Two");
            break;
        case 3:
            printf("Three");
            break;
        case 4:
            printf("Four");
            break;
        case 5:
            printf("Five");
            break;
        case 6:
            printf("Six");
            break;
        case 7:
    }
}
```

```
    printf("Seven");
    break;
    case 8:
        printf("Eight");
        break;
    case 9:
        printf("Nine");
        break;
    default:
        printf("Not a single digit.");
    }
    getch();
}
```

20.20. Write a program that reads any positive integer and display in roman digit.

```
#include<stdio.h>
#include<conio.h>
#include<stdlib.h>

void main()
{
    int *n,i;

    clrscr();
    printf("Enter any number: ");
    scanf("%d",n);

    for (i=1; i<=*n/1000; i++)
        printf("M");

    *n=*n%1000;
    switch(*n/100)
    {
        case 1:
            printf("C");
            break;
        case 2:
            printf("CC");
            break;
    }
}
```

```

        break;
case 3:
    printf("CCC");
    break;
case 4:
    printf("CD");
    break;
case 5:
    printf("D");
    break;
case 6:
    printf("DC");
    break;
case 7:
    printf("DCC");
    break;
case 8:
    printf("DCCC");
    break;
case 9:
    printf("CM");
    break;
}

*n=*n%100;
switch(*n/10)
{
case 1:
    printf("X");
    break;
case 2:
    printf("XX");
    break;
case 3:
    printf("XXX");
    break;
case 4:
    printf("XL");
    break;
case 5:
    printf("I");
    break;
}

```

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```

case 6:
    printf("LX");
    break;
case 7:
    printf("LXX");
    break;
case 8:
    printf("LXXX");
    break;
case 9:
    printf("XC");
    break;
}

*n=*n%10;
switch(*n)
{
case 1:
    printf("I");
    break;
case 2:
    printf("II");
    break;
case 3:
    printf("III");
    break;
case 4:
    printf("IV");
    break;
case 5:
    printf("V");
    break;
case 6:
    printf("VI");
    break;
case 7:
    printf("VII");
    break;
case 8:
    printf("VIII");
    break;
case 9:

```

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```

        printf("IX");
        break;
    }
    getch();
}

```

20.21. Write a program that read a positive integer and display its factorial.

```

#include<stdio.h>
#include<conio.h>
#include<stdlib.h>

void main()
{
    int *i,*n;
    long *fact;

    i=(int *)malloc(sizeof(int));
    n=(int *)malloc(sizeof(int));
    fact=(long *)malloc(sizeof(long));

    clrscr();
    printf("Enter any number: ");
    scanf("%d",n);

    *fact=1;
    for (*i=1; *i<=*n; (*i)++)
        *fact=*fact+*i;

    printf("Factorial :d= %ld",*n,*fact);
    getch();
}

```

20.22. Write a program that read any positive integer and display sum of its digit.

```

#include<stdio.h>
#include<conio.h>
#include<stdlib.h>

```

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```

void main()
{
    int *n,*sum;

    n=(int *)malloc(sizeof(int));
    sum=(int *)malloc(sizeof(int));

    clrscr();
    printf("Enter any number: ");
    scanf("%d",n);

    *sum=0;
    while(*n>0)
    {
        *sum+=*sum+*n%10;
        *n=*n/10;
    }

    printf("Sum of digits= %d",*sum);
    getch();
}

```

20.23. Write a program that reads and display an array.

```

#include<stdio.h>
#include<conio.h>
#include<stdlib.h>

void main()
{
    int *a,i,n;

    clrscr();
    printf("How many numbers: ");
    scanf("%d",&n);
    a=(int *)malloc(sizeof(int)*n);

    for (i=0; i<n; i++)
        scanf("%d",*(a+i));
}

```

```
for (i=0; i<n; i++)
printf("%d",*(a+i));
getch();
}
```

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20.24. Write a program that reads an array and display sum.

```
#include<stdio.h>
#include<conio.h>
#include<stdlib.h>

void main()
{
    int *a, i, n, sum=0;

    clrscr();
    printf("How many numbers: ");
    scanf("%d", &n);
    a=(int *)malloc(sizeof(int)*n);

    for (i=0; i<n; i++)
    scanf("%d", a+i);

    for (i=0; i<n; i++)
    sum=sum+*(a+i);

    printf("Sum= %d", sum);
    getch();
}
```

20.25. Write a program that reads an array and display average.

```
#include<stdio.h>
#include<conio.h>
#include<stdlib.h>

void main()
{
    int *a, i, n, sum=0;
```

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```
clrscr();
printf("How many numbers: ");
scanf("%d", &n);
a=(int *)malloc(sizeof(int)*n);

for (i=0; i<n; i++)
scanf("%d", a+i);

for (i=0; i<n; i++)
sum=sum+*(a+i);

printf("Average= %d", sum/n);
getch();
}
```

20.26. Write a program that reads an array and display average.

```
#include<stdio.h>
#include<conio.h>
#include<stdlib.h>

void main()
{
    int *a, i, n, sum=0;

    clrscr();
    printf("How many numbers: ");
    scanf("%d", &n);
    a=(int *)malloc(sizeof(int)*n);

    for (i=0; i<n; i++)
    scanf("%d", a+i);

    for (i=0; i<n; i++)
    sum=sum+*(a+i);

    printf("Average= %f", (float)sum/n);
    getch();
}
```

20.27. Write a program that reads an array and display maximum.

```
#include<stdio.h>
#include<conio.h>
#include<stdlib.h>

void main()
{
    int *a,i,n,max;

    clrscr();
    printf("How many numbers: ");
    scanf("%d",&n);
    a=(int *)malloc(sizeof(int)*n);

    for (i=0; i<n; i++)
        scanf("%d",&a[i]);

    max=*a;
    for (i=1; i<n; i++)
        if (*(&a[i])>max)
            max=*(a+i);

    printf("Maximum= %d",max);
    getch();
}
```

20.28. Write a program that reads an array and display minimum.

```
#include<stdio.h>
#include<conio.h>
#include<stdlib.h>

void main()
{
    int *a,i,n,min;
```

```
clrscr();
printf("How many numbers: ");
scanf("%d",&n);
a=(int *)malloc(sizeof(int)*n);

for (i=0; i<n; i++)
    scanf("%d",&a[i]);

min=*a;
for (i=1; i<n; i++)
    if (*(&a[i])<min)
        min=*(a+i);

printf("Minimum= %d",min);
getch();
}
```

20.29. Write a program that reads an array and search any given number.

```
#include<stdio.h>
#include<conio.h>
#include<stdlib.h>

void main()
{
    int *a,i,n,item,found=0;

    clrscr();
    printf("How many numbers: ");
    scanf("%d",&n);
    a=(int *)malloc(sizeof(int)*n);

    for (i=0; i<n; i++)
        scanf("%d",&a[i]);

    printf("Enter any number to search: ");
    scanf("%d",&item);

    for (i=0; i<n; i++)

```

```

if (*(&i)==item)
{
    found=1;
    break;
}

if (found==1)
printf("Found");
else
printf("Not found");
getch();
}

```

20.30. Write a program that reads an array and sort them.

```

#include<stdio.h>
#include<conio.h>
#include<stdlib.h>

void main()
{
    int *a,i,j,temp,n;

    clrscr();
    printf("How many numbers: ");
    scanf("%d",&n);
    a=(int *)malloc(sizeof(int)*n);

    for (i=0; i<n; i++)
    scanf("%d",a+i);

    for (i=n-1; i>0; i--)
    for (j=0; j<i; j++)
    if (*(&a+j)>*(a+j+1))
    {
        temp=*(a+j);
        *(a+j)=*(a+j+1);
        *(a+j+1)=temp;
    }
}

```

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```

for (i=0; i<n; i++)
printf("%4d",*(a+i));
getch();
}

```

20.31. Write a program that generates first n Fibonacci numbers.

```

#include<stdio.h>
#include<conio.h>
#include<stdlib.h>

void main()
{
    int i,n;
    long *a;

    clrscr();
    printf("How many numbers: ");
    scanf("%d",&n);

    a=(long *)malloc(sizeof(long)*n);

    *a=0;
    *(a+1)=1;
    for (i=2; i<n; i++)
    *(a+i)=*(a+i-1)+*(a+i-2);

    for (i=0; i<n; i++)
    printf("%10ld",*(a+i));
    getch();
}

```

20.32. Write a program that convert a line to upper case.

```

#include<stdio.h>
#include<conio.h>
#include<string.h>
#include<stdlib.h>

```

```

void main()
{
    char *st;
    int i,l;
    st=(char *)malloc(sizeof(char)*100);
    clrscr();
    printf("Enter any line: ");
    gets(st);

    l=strlen(st);
    for (i=0; i<l; i++)
    if (*(st+i)>='a' && *(st+i)<='z')
        printf("%c",*(st+i)-32);
    else
        printf("%c",*(st+i));
    getch();
}

```

20.33. Write a program that convert a line to lower case.

```

#include<stdio.h>
#include<conio.h>
#include<string.h>
#include<stdlib.h>

void main()
{
    char *st;
    int i,l;
    st=(char *)malloc(sizeof(char)*100);
    clrscr();
    printf("Enter any line: ");
    gets(st);

    l=strlen(st);
    for (i=0; i<l; i++)

```

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```

if (* (st+i) >='A' && * (st+i) <='Z')
    printf ("%c", * (st+i)+32);
else
    printf ("%c", * (st+i));
getch();
}

```

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20.34. Write a program that read your name and display every character with one space.

```

#include<stdio.h>
#include<conio.h>
#include<string.h>
#include<stdlib.h>

void main()
{
    char *st;
    int i,l;
    st=(char *)malloc(sizeof(char)*100);
    clrscr();
    printf("Enter your name: ");
    gets(st);

    l=strlen(st);
    for (i=0; i<l; i++)
        printf ("%c ",*(st+i));
    getch();
}

```

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20.35. Write a program that read your name and display every character with one space in reverse order.

```

#include<stdio.h>
#include<conio.h>

```

```

#include<string.h>
#include<stdlib.h>

void main()
{
    char *st;
    int i,i;

    st=(char *)malloc(sizeof(char)*100);
    clrscr();
    printf("Enter your name: ");
    gets(st);

    l=strlen(st);

    for (i=l-1; i>=0; i--)
    printf("%c ",*(st+i));
    getch();
}

```

20.36. Write a program that read any line of text and display every character in separate line.

```

#include<string.h>
#include<stdlib.h>
#include<stdio.h>
#include<conio.h>

void main()
{
    char *st;
    int i,l;
    " "
    clrscr();
    printf("Enter any line: ");
    gets(st);

    l=strlen(st);
    for (i=0; i<l; i++)

```

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```

        printf("\n%c",*(st+i));
        getch();
    }

```

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20.37. Write a program that read any line of text and display every character with ASCII value in separate line.

```

#include<string.h>
#include<stdlib.h>
#include<stdio.h>
#include<conio.h>

void main()
{
    char *st;
    int i,l;

    st=(char *)malloc(sizeof(char)*100);

    clrscr();
    printf("Enter any line: ");
    gets(st);

    l=strlen(st);
    for (i=0; i<l; i++)
    printf("\n%c %d",st[i],st[i]);
    getch();
}

```

20.38. Write a program that read a line of text and display number of upper case, lower case, digit, space and other character.

```

#include<stdio.h>
#include<conio.h>
#include<string.h>
#include<stdlib.h>

```

```

#include<string.h>
#include<stdlib.h>

void main()
{
    char *st;
    int l,i;

    st=(char *)malloc(sizeof(char)*100);
    clrscr();
    printf("Enter your name: ");
    gets(st);

    l=strlen(st);

    for (i=l-1; i>=0; i--)
        printf("\n%c ",*(st+i));
    getch();
}

```

20.36. Write a program that read any line of text and display every character in separate line.

```

#include<string.h>
#include<stdlib.h>
#include<stdio.h>
#include<conio.h>

void main()
{
    char *st;
    int i,l;
    ......

    clrscr();
    printf("Enter any line: ");
    gets(st);

    l=strlen(st);
    for (i=0; i<l; i++)

```

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```

        printf("\n%c",*(st+i));
        getch();
    }
}

```

20.37. Write a program that read any line of text and display every character with ASCII value in separate line.

```

#include<string.h>
#include<stdlib.h>
#include<stdio.h>
#include<conio.h>

void main()
{
    char *st;
    int i,l;

    st=(char *)malloc(sizeof(char)*100);

    clrscr();
    printf("Enter any line: ");
    gets(st);

    l=strlen(st);
    for (i=0; i<l; i++)
        printf("\n%c %d",st[i],st[i]);
    getch();
}

```

20.38. Write a program that read a line of text and display number of upper case, lower case, digit, space and other character.

```

#include<stdio.h>
#include<conio.h>
#include<string.h>
#include<stdlib.h>

```

```

void main()
{
    char *st;
    int i, l, upper=0, lower=0, digit=0, space=0, other=0;
    st=(char *)malloc(sizeof(char)*100);
    clrscr();
    printf("Enter any line: ");
    gets(st);

    l=strlen(st);
    for (i=0; i<l; i++)
    if (* (st+i)>='a' && *(st+i)<='z')
    lower++;
    else if (* (st+i)>='A' && *(st+i)<='Z')
    upper++;
    else if (* (st+i)>='0' && *(st+i)<='9')
    digit++;
    else if (* (st+i)==' ')
    space++;
    else
    other++;

    printf("\nUpper= %d", upper);
    printf("\nLower= %d", lower);
    printf("\nDigit= %d", digit);
    printf("\nSpace= %d", space);
    printf("\nOther= %d", other);
    getch();
}

```

20.39. Write a program that read a line of text and display number of vowel, consonant, digit, space and other characters.

```

#include<stdio.h>
#include<conio.h>
#include<string.h>
#include<stdlib.h>

```

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```

void main()
{
    char *st;
    int i, l, vowel=0, cons=0, digit=0, space=0, other=0;
    st=(char *)malloc(sizeof(char)*100);

    clrscr();
    printf("Enter any line of Text: ");
    gets(st);

    l=strlen(st);
    for (i=0; i<l; i++)
    if (* (st+i)=='a' || *(st+i)=='e' || *(st+i)=='i'
    || *(st+i)=='o' || *(st+i)=='u'
    || *(st+i)=='A' || *(st+i)=='E' || *(st+i)=='I'
    || *(st+i)=='O' || *(st+i)=='U')
    vowel++;
    else if (* (st+i)>='A' && *(st+i)<='Z')
    cons++;
    else if (* (st+i)>='a' && *(st+i)<='z')
    cons++;
    else if (* (st+i)>='0' && *(st+i)<='9')
    digit++;
    else if (* (st+i)==' ')
    space++;
    else
    other++;

    printf("\nVowel= %d", vowel);
    printf("\nConsonant= %d", cons);
    printf("\nDigit= %d", digit);
    printf("\nSpace= %d", space);
    printf("\nOther= %d", other);
    getch();
}

```

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20.40. Write a program that read a line of text and display the frequency of every letter.

```
#include<stdio.h>
#include<conio.h>
#include<string.h>
#include<stdlib.h>

void main()
{
    char *st;
    int i,l,a[26];

    st=(char *)malloc(sizeof(char)*100);

    clrscr();
    printf("Enter any line of Text: ");
    gets(st);

    for (i=0; i<26; i++)
        a[i]=0;

    l=strlen(st);
    for (i=0; i<l; i++)
        if (*st+i)>='a' && *(st+i)<='z'
            a[*st+i-97]++;
        else if (*st+i)>='A' && *(st+i)<='Z'
            a[*st+i-65]++;

    for (i=0; i<26; i++)
        if (a[i]>0)
            printf("\n%c= %d",i+65,a[i]);
    getch();
}
```

20.41. Write a program that read a line of text and display the frequency of every character.

```
#include<stdio.h>
#include<conio.h>
#include<string.h>
#include<stdlib.h>

void main()
{
    char *st;
    int i,l,a[256];

    st=(char *)malloc(sizeof(char)*100);

    clrscr();
    printf("Enter any line of Text: ");
    gets(st);

    for (i=0; i<256; i++)
        a[i]=0;

    l=strlen(st);
    for (i=0; i<l; i++)
        a[*st+i]++;
}

for (i=0; i<256; i++)
    if (a[i]>0)
        printf("%c=%2d\t",i,a[i]);
    getch();
}
```

20.42. Write a program that read and display an array of string.

```
#include<stdio.h>
#include<conio.h>
#include<string.h>
#include<stdlib.h>
```

```

void main()
{
    char *st[100];
    int i,n;

    for (i=0; i<100; i++)
        st[i]=(char *)malloc(sizeof(char)*40);

    clrscr();
    printf("How many line: ");
    scanf("%d\n", &n);

    for (i=0; i<n; i++)
        gets(st[i]);

    for (i=0; i<n; i++)
        printf("\n%s", st[i]);
    getch();
}

```

20.43. Write a program that read an array of string and display in alphabetic order (with case sensitive).

```

#include<stdio.h>
#include<conio.h>
#include<string.h>
#include<stdlib.h>

void main()

{
    char *st[100],temp[40];
    int i,n,outer,inner;

    for (i=0; i<100; i++)
        st[i]=(char *)malloc(sizeof(char)*40);

    clrscr();
    printf("How many word: ");
    scanf("%d\n", &n);

    for (i=0; i<n; i++)

```

```

        gets(st[i]);

        for (outer=n-1; outer>=0; outer--)
            for (inner=0; inner<outer; inner++)
                if (strcmp(st[inner],st[inner+1])>0)
                {
                    strcpy(temp,st[inner]);
                    strcpy(st[inner],st[inner+1]);
                    strcpy(st[inner+1],temp);
                }

        for (i=0; i<n; i++)
        printf("\n%s",st[i]);
        getch();
    }

```

20.44. Write a program that read an array of string and display in alphabetic order (without case sensitive).

```

#include<stdio.h>
#include<conio.h>
#include<string.h>
#include<stdlib.h>

void main()
{
    char *st[100],temp[40];
    int i,n,outer,inner;

    for (i=0; i<100; i++)
        st[i]=(char *)malloc(sizeof(char)*40);

    clrscr();
    printf("How many word: ");
    scanf("%d\n", &n);

    for (i=0; i<n; i++)
        gets(st[i]);

        for (outer=n-1; outer>=0; outer--)

```

```

for (inner=1; inner<outer; inner++)
{
    strcpy(stemp,st[inner],st[inner+1]);
    strcpy(st[inner],stemp);
    strcpy(st[inner+1],stemp);

    for (i=1; i<n; i++)
    printf("\n%2d",st[i]);
    getch();
}

```

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20.45. Write a program that read any binary number and display equivalent decimal number.

```

#include<stdio.h>
#include<conio.h>
#include<string.h>
#include<stdlib.h>

void main()
{
    char *st;
    long i,n,l;
    st=(char *)malloc(sizeof(char)*100);

    clrscr();
    printf("Enter any binary number: ");
    scanf(" %s",st);

    n=0;
    l=strlen(st);
    for (i=0; i<l; i++)
    n=n*2+(st[i])-48;

    printf("Equivalent decimal number is: %ld",n);
    getch();
}

```

Combined By <http://hsonnet.blogspot.com>

20.46. Write a program that read any octal number and display equivalent decimal number.

```

#include<stdio.h>
#include<conio.h>
#include<string.h>
#include<stdlib.h>

void main()
{
    char *st;
    long i,n,l;
    st=(char *)malloc(sizeof(char)*100);

    clrscr();
    printf("Enter any octal number: ");
    scanf("%s",st);

    n=0;
    l=strlen(st);
    for (i=0; i<l; i++)
    n=n*8+(st[i])-48;

    printf("Equivalent decimal number is: %ld",n);
    getch();
}

```

20.47. Write a program that read any hexadecimal number and display equivalent decimal number.

```

#include<stdio.h>
#include<conio.h>
#include<string.h>
#include<stdlib.h>

void main()
{
}

```

```

char *st;
long i,n,l;
st=(char *)malloc(sizeof(char)*100);
clrscr();
printf("Enter any hexadeciaml number: ");
scanf("%s",st);

n=0;
l=strlen(st);
for (i=0; i<l; i++)
if ((*st+i)>='0' && *(st+i)<='9')
n=n*16+*(st+i)-48;
else if ((*st+i)>='A' && *(st+i)<='F')
n=n*16+*(st+i)-55;
else if ((*st+i)>='a' && *(st+i)<='f')
n=n*16+*(st+i)-87;

printf("Equivalent decimal number is: %ld",n);
getch();
}

```

20.48. Write a program that read and display a matrix.

```

#include<stdio.h>
#include<conio.h>
#include<stdlib.h>

void main()
{
    int i,j,r,c,*a[10];

    for (i=0; i<10; i++)
a[i]=(int *)malloc(sizeof(int)*10);

clrscr();
printf("How many row: ");
scanf("%d",&r);
printf("How many column: ");

```

```

scanf("%d",&c);

for (i=0; i<r; i++)
for (j=0; j<c; j++)
scanf("%d",*(a+i)+j);

for (i=0; i<r; i++)
{
    for (j=0; j<c; j++)
printf("%4d",*(a+i)+j);
    printf("\n");
}
getch();
}

```

20.49. Write a program that adds two matrices.

```

#include<stdio.h>
#include<conio.h>
#include<stdlib.h>

void main()
{
    int i,j,r1,c1,r2,c2,*a[10],*b[10],*c[10];

    for (i=0; i<10; i++)
    {
        a[i]=(int *)malloc(sizeof(int)*10);
        b[i]=(int *)malloc(sizeof(int)*10);
        c[i]=(int *)malloc(sizeof(int)*10);
    }

    clrscr();
    printf("How many row in A: ");
    scanf("%d",&r1);
    printf("How many column in A: ");
    scanf("%d",&c1);

    for (i=0; i<r1; i++)
        for (j=0; j<c1; j++)

```

```

scanf("%d", &(a[i]+j));
Ashraf
printf("How many row in A: ");
scanf("%d", &r2);
printf("How many column in A: ");
scanf("%d", &c2);

for (i=0; i<r2; i++)
for (j=0; j<c2; j++)
scanf("%d", &(b[i]+j));

if (r1==r2 & c1==c2)
{
    for (i=0; i<r1; i++)
    for (j=0; j<c1; j++)
        *(c+i)+j)=*(a+i)+j)**(b+i)+j;

    printf("\nThe sum of A and B is: \n");
    for (i=0; i<r1; i++)
    {
        for (j=0; j<c1; j++)
            printf("%d", *(c+i)+j));
        printf("\n");
    }
}
else
printf("\nThe sum of A and B is impossible.");
getch();
}

```

20.50. Write a program that multiplies two matrices.

```

#include<stdio.h>
#include<conio.h>
#include<stdlib.h>

void main()
{
    int i,j,k,r1,c1,r2,c2,*a[10],*b[10],*d[10];

```

Combined By http://lhsonnet.blogspot.com

```

for (i=0; i<10; i++)
{
    a[i]=(int *)malloc(sizeof(int)*10);
    b[i]=(int *)malloc(sizeof(int)*10);
    d[i]=(int *)malloc(sizeof(int)*10);
}

clrscr();
printf("How many row in A: ");
scanf("%d", &r1);
printf("How many column in A: ");
scanf("%d", &c1);

for (i=0; i<r1; i++)
for (j=0; j<c1; j++)
scanf("%d", &(a[i]+j));

printf("How many row in B: ");
scanf("%d", &r2);
printf("How many column in B: ");
scanf("%d", &c2);

for (i=0; i<r2; i++)
for (j=0; j<c2; j++)
scanf("%d", &(b[i]+j));

if (c1==r2)
{
    for (i=0; i<r1; i++)
    for (j=0; j<c2; j++)
        *(d+i)+j)=0;
    for (k=0; k<c1; k++)
        *(d+i)+j)=*(d+i)+j)+*(a+i)+k)***(b+k)+j);
}

printf("\nThe multiplication of A and B is:
\n");
for (i=0; i<r1; i++)
{

```

```

    for (j=0; j<c2; j++)
        printf("%d", *(*(d+i)+j));
    printf("\n");
}
else
printf("\nThe multiplication of A and B is
impossible.");
getch();
}

```

20.51. Write a program that read and display any students name, roll, mark.

```

#include<stdio.h>
#include<conio.h>
#include<stdlib.h>

struct student
{
    char name[30];
    int roll,mark;
};

void main()
{
    struct student *a;
    clrscr();
    a=(struct student *)malloc(sizeof(struct
student));
    printf("Enter name: ");
    scanf("%s",a->name);
    printf("Enter roll: ");
    scanf("%d",&a->roll);
    printf("Enter mark: ");
    scanf("%d",&a->mark);
}

```

```

    printf("Name: %s      Roll: %d      Mark: %d",a-
>name,a->roll,a->mark);
getch();
}

```

20.52. Write a program that read and display some students name, roll and mark.

```

#include<stdio.h>
#include<conio.h>
#include<stdlib.h>

struct student
{
    char name[30];
    int roll,mark;
};

void main()
{
    struct student *a;
    int i,n;

    clrscr();
    printf("How many student: ");
    scanf("%d",&n);

    a=(struct student *)malloc(sizeof(struct
student)*n);

    for (i=0; i<n; i++)
    {
        printf("Name: ");
        scanf("%s",*(a+i)->name);
        printf("Roll: ");
        scanf("%d",*(a+i)->roll);
        printf("Mark: ");
        scanf("%d",*(a+i)->mark);
    }
}

```

```

printf("\nName      Roll   Mark");
printf("\n~~~~~    ~~~~   ~~~~");
for (i=0; i<n; i++)
printf("\n%-10s %d %4d", (a+i)->name, (a+i)->roll, (a+i)->mark);
getch();
}

```

Ashraf

20.53. Write a program that create a linklist to store some integer numbers.

```

#include<stdio.h>
#include<conio.h>
#include<stdlib.h>

struct node
{
    int info;
    struct node *next;
};

struct node *makenode(int n)
{
    struct node *t;

    t=(struct node *)malloc(sizeof(struct node));
    t->info=n;
    t->next=NULL;

    return t;
}

void makelist(struct node *list)
{
    int i,n,num;

    printf("How many node: ");
    scanf("%d", &n);

    for (i=1; i<=n; i++)

```

Combined By <http://hsonnet.blogspot.com>

```

        scanf("%d",&num);
        list->next=makenode(num);
        list=list->next;
    }

    void printlist(struct node *list)
    {
        printf("\nList contains: \n");
        while(list->next!=NULL)
        {
            printf("%d",list->next->info);
            list=list->next;
        }
    }

    void main()
    {
        struct node *start;

        start=(struct node *)malloc(sizeof(struct node));

        clrscr();
        makelist(start);
        printlist(start);
        getch();
    }
}

```

20.54. Write a program that create a link list to store some character.

```

#include<stdio.h>
#include<conio.h>
#include<stdlib.h>

struct node
{

```

```

    char info;
    struct node *next;
};

struct node *makenode(char n)
{
    struct node *t;
    t=(struct node *)malloc(sizeof(struct node));
    t->info=n;
    t->next=NULL;
    return t;
}

void makelist(struct node *list)
{
    int i,n;
    char num;

    printf("How many node: ");
    scanf("%d%c", &n);

    for (i=1; i<=n; i++)
    {
        scanf("%c%c", &num);
        list->next=makenode(num);
        list=list->next;
    }
}

void printlist(struct node *list)
{
    printf("\nList contains: \n");
    while(list->next!=NULL)
    {
        printf("%c ",list->next->info);
        list=list->next;
    }
}

```

```

void main()
{
    struct node *start;

    start=(struct node *)malloc(sizeof(struct node));
    clrscr();
    makelist(start);
    printlist(start);
    getch();
}

20.55. Write a program that create a link list to store some long numbers.

#include<stdio.h>
#include<conio.h>
#include<stdlib.h>

struct node
{
    long info;
    struct node *next;
};

struct node *makenode(long n)
{
    struct node *t;
    t=(struct node *)malloc(sizeof(struct node));
    t->info=n;
    t->next=NULL;
    return t;
}

void makelist(struct node *list)
{
    int i,n;

```

```

long num;
printf("How many node: ");
scanf("%d",&n);

for (i=1; i<=n; i++)
{
    scanf("%lf",&num);
    list->next=makenode(num);
    list=list->next;
}

void printlist(struct node *list)
{
    printf("\nList contains: \n");
    while(list->next!=NULL)
    {
        printf("%lf ",list->next->info);
        list=list->next;
    }
}

void main()
{
    struct node *start;

    start=(struct node *)malloc(sizeof(struct
node));

    clrscr();
    makelist(start);
    printlist(start);
    getch();
}

```

Ashraf

20.56. Write a program that create a link list to store some double numbers.

```

#include<stdio.h>
#include<conio.h>
#include<stdlib.h>

struct node
{
    double info;
    struct node *next;
};

struct node *makenode(double n)
{
    struct node *t;

    t=(struct node *)malloc(sizeof(struct node));
    t->info=n;
    t->next=NULL;

    return t;
}

void makelist(struct node *list)
{
    int i,n;
    double num;

    printf("How many node: ");
    scanf("%d",&n);

    for (i=1; i<=n; i++)
    {
        scanf("%lf",&num);
        list->next=makenode(num);
        list=list->next;
    }
}

```

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```

void printlist(struct node *list)
{
    printf("\nList contains: \n");
    while(list->next!=NULL)
    {
        printf("%d ",list->next->info);
        list=list->next;
    }
}

void main()
{
    struct node *start;
    start=(struct node *)malloc(sizeof(struct
node));
    clrscr();
    makelist(start);
    printlist(start);
    getch();
}

```

Ashraf

20.57. Write a program that create, insert, and delete a one-way link list.

```

#include<stdio.h>
#include<conio.h>
#include<stdlib.h>

struct node
{
    int info;
    struct node *next;
};

struct node *makenode(int n)
{
    struct node *t;

```

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```

t=(struct node *)malloc(sizeof(struct node));
t->info=n;
t->next=NULL;

return t;
}

void makelist(struct node *list)
{
    int i,n,num;
    printf("How many node: ");
    scanf("%d",&n);

    for (i=1; i<=n; i++)
    {
        scanf("%d",&num);
        list->next=makenode(num);
        list=list->next;
    }
}

void printlist(struct node *list)
{
    printf("\nList contains: \n");
    while(list->next!=NULL)
    {
        printf("%d ",list->next->info);
        list=list->next;
    }
}

int countlist(struct node *list)
{
    int count=0;

    while(list->next!=NULL)
    {
        count++;
        list=list->next;
    }
}
```

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```

    }

    return count;
}

void insertfirst(struct node *list)
{
    int n;
    struct node *t;

    printf("\nEnter any number to insert first: ");
    scanf("%d",&n);

    t=makenode(n);
    t->next=list->next;
    list->next=t;
}

void deletefirst(struct node *list)
{
    struct node *t;

    t=list->next->next;
    free(list->next);
    list->next=t;
}

void insertlast(struct node *list)
{
    int n;
    struct node *t;

    printf("\nEnter any number to insert last: ");
    scanf("%d",&n);

    while(list->next!=NULL)
        list=list->next;

    list->next=makenode(n);
}

void deletelast(struct node *list)
{
}

```

```

    while(list->next->next!=NULL)
        list=list->next;

    free(list->next);
    list->next=NULL;
}

void insertmiddle(struct node *list)
{
    int n,count,i,p;
    struct node *t;

    count=countlist(list);

    printf("\nEnter any position to insert: ");
    scanf("%d",&p);

    if (p<1 || p>count+1)
        printf("Insert is impossible");
    else
    {
        for (i=1; i<p; i++)
            list=list->next;

        printf("Enter any number to insert middle: ");
        scanf("%d",&n);

        t=makenode(n);
        t->next=list->next;
        list->next=t;
    }
}

void deletemiddle(struct node *list)
{
    int count,i,p;
    struct node *t;

    count=countlist(list);
}

```

```

printf("\nEnter any position to delete: ");
scanf("%d",&p);
if (p<1 || p>count)
printf("Delete is impossible");
else
{
    for (i=1; i<p; i++)
        list=list->next;
    t=list->next->next;
    free(list->next);
    list->next=t;
}

void main()
{
    int n,choice;
    struct node *list;
    clrscr();
    list=(struct node *)malloc(sizeof(struct node));
    makelist(list);
    do
    {
        clrscr();
        printlist(list);
        printf("\nEnter your choice from 1 to 7.");
        printf("\n1. Insert First.");
        printf("\n2. Insert Middle.");
        printf("\n3. Insert Last.");
        printf("\n4. Delete First.");
        printf("\n5. Delete Middle.");
        printf("\n6. Delete Last.");
        printf("\n7. Exit\n");
        scanf("%d",&choice);

        switch(choice)
    }
}

```

```

case 1:
    insertfirst(list);
    break;
case 2:
    insertmiddle(list);
    break;
case 3:
    insertlast(list);
    break;
case 4:
    deletefirst(list);
    break;
case 5:
    deletemiddle(list);
    break;
case 6:
    deletelast(list);
    break;
case 7:
    printf("\nThe program is now exit.");
    printf("\nPress any key to continue..."); 
    break;
default:
    printf("\nYour choice out of range.");
    printf("\nPlease try again.");
}
printlist(list);
getch();
}while(choice!=7);
}

```

20.58. Write a program that create, insert, and delete a two-way link list.

```

#include<stdio.h>
#include<conio.h>
#include<stdlib.h>

struct node
{

```

```

int info;
struct node *next,*prev;

};

struct node *makenode(int n)
{
    struct node *t;
    t=(struct node *)malloc(sizeof(struct node));
    t->info=n;
    t->next=NULL;
    t->prev=NULL;
    return t;
}

```

```

void makelist(struct node *list)
{
    int i,n,num;
    printf("How many node: ");
    scanf("%d",&n);
    for (i=1; i<=n; i++)
    {
        scanf("%d",&num);
        list->next=makenode(num);
        list->next->prev=list;
        list=list->next;
    }
}

```

```

void printlist(struct node *list)
{
    printf("\nList contains: \n");
    while(list->next!=NULL)
    {
        printf("%5d",list->next->info);
        list=list->next;
    }
}

```

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```

int countlist(struct node *list)
{
    int count=0;
    while(list->next!=NULL)
    {
        count++;
        list=list->next;
    }
    return count;
}

void insertfirst(struct node *list)
{
    int n;
    struct node *t;
    printf("Enter any number to insert first: ");
    scanf("%d",&n);
    t=makenode(n);
    list->next->prev=t;
    t->prev=list;
    t->next=list->next;
    list->next=t;
}

void deletefirst(struct node *list)
{
    struct node *t;
    t=list->next->next;
    free(list->next);
    t->prev=list;
    list->next=t;
}

void insertmiddle(struct node *list)
{
}

```

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```

int l,n,choice,p;
struct node *list;
char c;

if(list==NULL)
{
    printf("Enter any number to insert last: ");
    scanf("%d",&n);
    t=makenode(n);
    list->next=t;
    t->prev=list;
    t->next=list->next;
    list->next=t;
}

for(i=1;i<p;i++)
    list=list->next;

printf("Enter any number to insert middle: ");
scanf("%d",&n);
t=makenode(n);
list->next->prev=t;
t->prev=list;
t->next=list->next;
list->next=t;

void deleteriddle(struct node *list)
{
    struct node *t;
    int count,i,p;
    clrscr();
    if(list==NULL)
    {
        printf("Enter any position to delete riddle: ");
        scanf("%d",&p);
        if(p>l)
        {
            printf("No such position exists");
        }
        for(i=1;i<p;i++)
            list=list->next;
    }
}

```

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```

t=list->next->next;
free(list->next);
t->prev=list;
list->next=t;
}

void insertlast(struct node *list)
{
    int n;
    struct node *t;

    printf("Enter any number to insert last: ");
    scanf("%d",&n);
    t=makenode(n);

    while(list->next!=NULL)
        list=list->next;

    t->prev=list;
    list->next=t;
}

void deletelast(struct node *list)
{
    while(list->next->next!=NULL)
        list=list->next;

    free(list->next);
    list->next=NULL;
}

void main()
{
    int n,choice;
    struct node *list;

    clrscr();
    list=(struct node *)malloc(sizeof(struct node));
    makenode(list);

    do

```

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```

clrscr();
printlist();
printf("\n\nEnter choice from 1 to 7.");
printf("\n1. Insert First.");
printf("\n2. Insert Middle.");
printf("\n3. Insert Last.");
printf("\n4. Delete First.");
printf("\n5. Delete Middle.");
printf("\n6. Delete Last.");
printf("\n7. Exit\n");
scanf("%d",&choice);

switch(choice)
{
case 1:
    insertfirst(list);
    break;
case 2:
    insertmiddle(list);
    break;
case 3:
    insertlast(list);
    break;
case 4:
    deletefirst(list);
    break;
case 5:
    deletemiddle(list);
    break;
case 6:
    deletelast(list);
    break;
case 7:
    printf("\nThe program is now exit.");
    printf("\nPress any key to continue...");
    break;
default:
    printf("\nYour choice out of range.");
    printf("\nPlease try again.");
}
printlist(list);

```

 Combined By <http://hsomnet.blogspot.com>

```

getch();
}while(choice!=7);
}

```

20.59. Write a program that swaps two numbers.

```

#include<stdio.h>
#include<conio.h>

void swap(int *a, int *b)
{
    int temp;

    temp=*a;
    *a=*b;
    *b=temp;
}

void main()
{
    int a,b;

    clrscr();
    printf("a= ");
    scanf("%d",&a);
    printf("b= ");
    scanf("%d",&b);

    swap(&a,&b);

    printf("After swap: \n");
    printf("a= %d\n",a);
    printf("b= %d\n",b);
    getch();
}

```