1. IF-ELSE PROGRAMS (1-25)

1. Check positive, negative, or zero

```
#include<stdio.h>
int main(){
    int n;
    scanf("%d", &n);
    if(n > 0)
        printf("Positive");
    else if(n < 0)
        printf("Negative");
    else
        printf("Zero");
    return 0;
}
```

2. Check even or odd

```
#include<stdio.h>
int main(){
    int n;
    scanf("%d", &n);
    if(n % 2 == 0)
        printf("Even");
    else
        printf("Odd");
    return 0;
}
```

3. Find largest of two numbers

```
#include<stdio.h>
int main(){
    int a, b;
    scanf("%d %d", &a, &b);
    if(a > b)
        printf("%d", a);
    else
        printf("%d", b);
    return 0;
}
```

4. Find largest of three numbers

```
#include<stdio.h>
int main(){
    int a, b, c;
    scanf("%d %d %d", &a, &b, &c);
    if(a > b && a > c)
        printf("%d", a);
    else if(b > a && b > c)
        printf("%d", b);
    else
        printf("%d", c);
    return 0;
}
```

5. Check leap year

```
#include<stdio.h>
int main(){
    int y;
    scanf("%d", &y);
    if((y % 4 == 0 && y % 100 != 0) || (y % 400 == 0))
        printf("Leap Year");
    else
        printf("Not Leap Year");
    return 0;
}
```

6. Check vowel or consonant

```
#include<stdio.h>
int main(){
    char ch;
    scanf("%c", &ch);
    if(ch=='a' || ch=='e' || ch=='i' || ch=='o' || ch=='u' ||
       ch=='A' || ch=='E' || ch=='I' || ch=='O' || ch=='U')
        printf("Vowel");
    else
        printf("Consonant");
    return 0;
}
```

7. Check alphabet or not

```
#include<stdio.h>
int main(){
    char ch;
    scanf("%c", &ch);
    if((ch >= 'a' && ch <= 'z') || (ch >= 'A' && ch <= 'Z'))
        printf("Alphabet");
    else
        printf("Not Alphabet");
    return 0;
}
```

8. Check uppercase, lowercase, digit, or special

```
#include<stdio.h>
int main(){
    char ch;
    scanf("%c", &ch);
    if(ch >= 'A' && ch <= 'Z')
        printf("Uppercase");
    else if(ch >= 'a' && ch <= 'z')
        printf("Lowercase");
    else if(ch >= '0' && ch <= '9')
        printf("Digit");
    else
        printf("Special");
    return 0;
}
```

9. Find absolute value

```
#include<stdio.h>
int main(){
    int n;
    scanf("%d", &n);
    if(n < 0)
        printf("%d", -n);
    else
        printf("%d", n);
    return 0;
}
```

10. Check divisible by 5 and 11

```
#include<stdio.h>
int main(){
    int n;
    scanf("%d", &n);
    if(n % 5 == 0 && n % 11 == 0)
        printf("Divisible by both");
    else
        printf("Not divisible");
    return 0;
}
```

11. Check prime number

```
#include<stdio.h>
int main(){
    int n, i, flag = 1;
    scanf("%d", &n);
    if(n <= 1)
        flag = 0;
    else {
        for(i = 2; i * i <= n; i++) {
            if(n % i == 0) {
                flag = 0;
                break;
            }
        }
    }
    if(flag)
        printf("Prime");
    else
        printf("Not Prime");
    return 0;
}
```

12. Find roots of quadratic equation

```
#include<stdio.h>
#include<math.h>
int main(){
    float a, b, c, d, r1, r2;
    scanf("%f %f %f", &a, &b, &c);
    d = b*b - 4*a*c;
    if(d > 0) {
        r1 = (-b + sqrt(d)) / (2*a);
        r2 = (-b - sqrt(d)) / (2*a);
        printf("Real: %.2f %.2f", r1, r2);
    }
    else if(d == 0) {
        r1 = -b / (2*a);
        printf("Equal: %.2f", r1);
    }
    else
        printf("Imaginary");
    return 0;
}
```

13. Find grade based on marks

```
#include<stdio.h>
int main(){
    int m;
    scanf("%d", &m);
    if(m >= 90)
        printf("A");
    else if(m >= 80)
        printf("B");
    else if(m >= 70)
        printf("C");
    else if(m >= 60)
        printf("D");
    else
        printf("F");
    return 0;
}
```

14. Find profit or loss percentage

```
#include<stdio.h>
int main(){
    float cp, sp, p;
    scanf("%f %f", &cp, &sp);
    if(sp > cp) {
        p = ((sp - cp) / cp) * 100;
        printf("Profit: %.2f", p);
    }
    else if(sp < cp) {
        p = ((cp - sp) / cp) * 100;
        printf("Loss: %.2f", p);
    }
    else
        printf("No profit loss");
    return 0;
}
```

15. Check voting eligibility

```
#include<stdio.h>
int main(){
    int age;
    scanf("%d", &age);
    if(age >= 18)
        printf("Eligible");
    else
        printf("Not eligible");
    return 0;
}
```

16. Check driving eligibility

```
#include<stdio.h>
int main(){
    int age;
    scanf("%d", &age);
    if(age >= 18)
        printf("Can drive");
    else
        printf("Cannot drive");
    return 0;
}
```

17. Find youngest among three

```
#include<stdio.h>
int main(){
    int a, b, c;
    scanf("%d %d %d", &a, &b, &c);
    if(a < b && a < c)
        printf("%d", a);
    else if(b < a && b < c)
        printf("%d", b);
    else
        printf("%d", c);
    return 0;
}
```

18. Find oldest among three

```
#include<stdio.h>
int main(){
    int a, b, c;
    scanf("%d %d %d", &a, &b, &c);
    if(a > b && a > c)
        printf("%d", a);
    else if(b > a && b > c)
        printf("%d", b);
    else
        printf("%d", c);
    return 0;
}
```

19. Check if triangle is valid

```
#include<stdio.h>
int main(){
    int a, b, c;
    scanf("%d %d %d", &a, &b, &c);
    if(a + b + c == 180)
        printf("Valid");
    else
        printf("Invalid");
    return 0;
}
```

20. Classify triangle

```
#include<stdio.h>
int main(){
    int a, b, c;
    scanf("%d %d %d", &a, &b, &c);
    if(a == b && b == c)
        printf("Equilateral");
    else if(a == b || b == c || a == c)
        printf("Isosceles");
    else
        printf("Scalene");
    return 0;
}
```

21. Check palindrome

```
#include<stdio.h>
int main(){
    int n, temp, rev = 0, r;
    scanf("%d", &n);
    temp = n;
    while(temp > 0) {
        r = temp % 10;
        rev = rev * 10 + r;
        temp /= 10;
    }
    if(n == rev)
        printf("Palindrome");
    else
        printf("Not palindrome");
    return 0;
}
```

22. Check Armstrong number

```
#include<stdio.h>
#include<math.h>
int main(){
    int n, temp, sum = 0, r, d = 0;
    scanf("%d", &n);
    temp = n;
    while(temp > 0) {
        d++;
        temp /= 10;
    }
    temp = n;
    while(temp > 0) {
        r = temp % 10;
        sum += pow(r, d);
        temp /= 10;
    }
    if(sum == n)
        printf("Armstrong");
    else
        printf("Not Armstrong");
    return 0;
}
```

23. Check perfect square

```
#include<stdio.h>
#include<math.h>
int main(){
    int n, sq;
    scanf("%d", &n);
    sq = sqrt(n);
    if(sq * sq == n)
        printf("Perfect square");
    else
        printf("Not perfect square");
    return 0;
}
```

24. Check divisible by 3 and 7

```
#include<stdio.h>
int main(){
    int n;
    scanf("%d", &n);
    if(n % 3 == 0 && n % 7 == 0)
        printf("Divisible");
    else
        printf("Not divisible");
    return 0;
}
```

25. Electricity bill calculation

```
#include<stdio.h>
int main(){
    int u;
    float bill;
    scanf("%d", &u);
    if(u <= 100)
        bill = u * 2;
    else if(u <= 300)
        bill = 200 + (u - 100) * 3;
    else
        bill = 200 + 600 + (u - 300) * 5;
    printf("%.2f", bill);
    return 0;
}
```

2. SWITCH PROGRAMS (26-50)

26. Simple calculator

```
#include<stdio.h>
int main(){
    int a, b;
    char op;
    scanf("%d %c %d", &a, &op, &b);
    switch(op) {
        case '+': printf("%d", a+b); break;
        case '-': printf("%d", a-b); break;
        case '*': printf("%d", a*b); break;
        case '/': printf("%d", a/b); break;
        case '%': printf("%d", a%b); break;
        default: printf("Invalid");
    }
    return 0;
}
```

27. Print day of week

```
#include<stdio.h>
int main(){
    int d;
    scanf("%d", &d);
    switch(d) {
        case 1: printf("Monday"); break;
        case 2: printf("Tuesday"); break;
        case 3: printf("Wednesday"); break;
        case 4: printf("Thursday"); break;
        case 5: printf("Friday"); break;
        case 6: printf("Saturday"); break;
        case 7: printf("Sunday"); break;
        default: printf("Invalid");
    }
    return 0;
}
```

28. Print month name

```
#include<stdio.h>
int main(){
    int m;
    scanf("%d", &m);
    switch(m) {
        case 1: printf("January"); break;
        case 2: printf("February"); break;
        case 3: printf("March"); break;
        case 4: printf("April"); break;
        case 5: printf("May"); break;
        case 6: printf("June"); break;
        case 7: printf("July"); break;
        case 8: printf("August"); break;
        case 9: printf("September"); break;
        case 10: printf("October"); break;
        case 11: printf("November"); break;
        case 12: printf("December"); break;
    }
    return 0;
}
```

29. Find days in month

```
#include<stdio.h>
int main(){
    int m;
    scanf("%d", &m);
    switch(m) {
        case 1: case 3: case 5: case 7:
        case 8: case 10: case 12:
            printf("31"); break;
        case 4: case 6: case 9: case 11:
            printf("30"); break;
        case 2:
            printf("28"); break;
    }
    return 0;
}
```

30. Vowel or consonant using switch

```
#include<stdio.h>
int main(){
    char ch;
    scanf("%c", &ch);
    ch = tolower(ch);
    switch(ch) {
        case 'a': case 'e': case 'i':
        case 'o': case 'u':
            printf("Vowel"); break;
        default:
            printf("Consonant");
    }
    return 0;
}
```

31. Character type using switch

```
#include<stdio.h>
int main(){
    char ch;
    scanf("%c", &ch);
    if(ch >= 'A' && ch <= 'Z')
        printf("Uppercase");
    else if(ch >= 'a' && ch <= 'z')
        printf("Lowercase");
    else if(ch >= '0' && ch <= '9')
        printf("Digit");
    else
        printf("Special");
    return 0;
}
```

32. Area calculator menu

```
#include<stdio.h>
#include<math.h>
int main(){
    int ch;
    float r, l, w, a, b, c, area;
    printf("1-Circle 2-Rect 3-Tri
");
    scanf("%d", &ch);
    switch(ch) {
        case 1:
            scanf("%f", &r);
            area = 3.14 * r * r;
            printf("%.2f", area); break;
        case 2:
            scanf("%f %f", &l, &w);
            area = l * w;
            printf("%.2f", area); break;
        case 3:
            scanf("%f %f %f", &a, &b, &c);
            float s = (a+b+c)/2;
            area = sqrt(s*(s-a)*(s-b)*(s-c));
            printf("%.2f", area); break;
    }
    return 0;
}
```

33. Volume calculator menu

```
#include<stdio.h>
#include<math.h>
int main(){
    int ch;
    float a, l, w, h, r, vol;
    printf("1-Cube 2-Cuboid 3-Sphere
");
    scanf("%d", &ch);
    switch(ch) {
        case 1:
            scanf("%f", &a);
            vol = a*a*a;
            printf("%.2f", vol); break;
        case 2:
            scanf("%f %f %f", &l, &w, &h);
            vol = l*w*h;
            printf("%.2f", vol); break;
        case 3:
            scanf("%f", &r);
            vol = (4.0/3)*3.14*r*r*r;
            printf("%.2f", vol); break;
    }
    return 0;
}
```

34. Even or odd using switch

```
#include<stdio.h>
int main(){
    int n;
    scanf("%d", &n);
    switch(n % 2) {
        case 0:
            printf("Even"); break;
        case 1:
            printf("Odd"); break;
    }
    return 0;
}
```

35. Max of two using switch

```
#include<stdio.h>
int main(){
    int a, b;
    scanf("%d %d", &a, &b);
    switch(a > b) {
        case 1:
            printf("%d", a); break;
        case 0:
            printf("%d", b); break;
    }
    return 0;
}
```

36. Max of three using switch

```
#include<stdio.h>
int main(){
    int a, b, c;
    scanf("%d %d %d", &a, &b, &c);
    switch(a > b) {
        case 1:
            switch(a > c) {
                case 1: printf("%d", a); break;
                case 0: printf("%d", c); break;
            } break;
        case 0:
            switch(b > c) {
                case 1: printf("%d", b); break;
                case 0: printf("%d", c); break;
            }
    }
    return 0;
}
```

37. Grade display based on marks

```
#include<stdio.h>
int main(){
    int m;
    scanf("%d", &m);
    switch(m/10) {
        case 10: case 9:
            printf("A"); break;
        case 8:
            printf("B"); break;
        case 7:
            printf("C"); break;
        case 6:
            printf("D"); break;
        default:
            printf("F");
    }
    return 0;
}
```

38. Multiplication table

```
#include<stdio.h>
int main(){
    int n, i;
    scanf("%d", &n);
    for(i = 1; i <= 10; i++)
        printf("%d*%d=%d
", n, i, n*i);
    return 0;
}
```

39. Arithmetic operations menu

```
#include<stdio.h>
int main(){
    int a, b, op;
    printf("1+2-3*4/5\%
");
    scanf("%d %d %d", &op, &a, &b);
    switch(op) {
        case 1: printf("%d", a+b); break;
        case 2: printf("%d", a-b); break;
        case 3: printf("%d", a*b); break;
        case 4: printf("%d", a/b); break;
        case 5: printf("%d", a%b); break;
        default: printf("Invalid");
    }
    return 0;
}
```

40. Temperature conversion

```
#include<stdio.h>
int main(){
    int ch;
    float t, res;
    printf("1-CtoF 2-FtoC
");
    scanf("%d %f", &ch, &t);
    switch(ch) {
        case 1:
            res = (t*9/5)+32;
            printf("%.2f", res); break;
        case 2:
            res = (t-32)*5/9;
            printf("%.2f", res); break;
    }
    return 0;
}
```

41. Unit conversion menu

```
#include<stdio.h>
int main(){
    int ch;
    float v, res;
    printf("1-km-m 2-m-cm 3-m-km
");
    scanf("%d %f", &ch, &v);
    switch(ch) {
        case 1:
            res = v*1000;
            printf("%.2f", res); break;
        case 2:
            res = v*100;
            printf("%.2f", res); break;
        case 3:
            res = v/1000;
            printf("%.2f", res); break;
    }
    return 0;
}
```

42. SI and CI calculator

```
#include<stdio.h>
#include<math.h>
int main(){
    int ch;
    float p, r, t, si, ci;
    printf("1-SI 2-CI
");
    scanf("%d %f %f %f", &ch, &p, &r, &t);
    switch(ch) {
        case 1:
            si = (p*r*t)/100;
            printf("%.2f", si); break;
        case 2:
            ci = p*(pow((1+r/100),t))-p;
            printf("%.2f", ci); break;
    }
    return 0;
}
```

43. Triangle type menu

```
#include<stdio.h>
int main(){
    int ch;
    float a, b, c;
    printf("1-Equi 2-Iso 3-Scalene
");
    scanf("%d %f %f %f", &ch, &a, &b, &c);
    switch(ch) {
        case 1:
            if(a==b&&b==c) printf("Valid");
            else printf("Invalid"); break;
        case 2:
            if(a==b||b==c||a==c) printf("Valid");
            else printf("Invalid"); break;
        case 3:
            if(a!=b&&b!=c&&a!=c) printf("Valid");
            else printf("Invalid"); break;
    }
    return 0;
}
```

44. Pattern menu

```
#include<stdio.h>
int main(){
    int ch, n, i, j;
    printf("1-Square 2-Tri 3-Pyramid
");
    scanf("%d %d", &ch, &n);
    switch(ch) {
        case 1:
            for(i=0; i<n; i++) {
                for(j=0; j<n; j++) printf("* ");
                printf("
");
            } break;
        case 2:
            for(i=1; i<=n; i++) {
                for(j=0; j<i; j++) printf("* ");
                printf("
");
            } break;
        case 3:
            for(i=1; i<=n; i++) {
                for(j=0; j<n-i; j++) printf(" ");
                for(j=0; j<i; j++) printf("* ");
                printf("
");
            } break;
    }
    return 0;
}
```

45. Factorial, Fibonacci, Prime menu

```
#include<stdio.h>
int main(){
    int ch, n, i, a=0, b=1, c, fact=1, flag=1;
    printf("1-Fact 2-Fib 3-Prime
");
    scanf("%d %d", &ch, &n);
    switch(ch) {
        case 1:
            for(i=1; i<=n; i++) fact*=i;
            printf("%d", fact); break;
        case 2:
            for(i=0; i<n; i++) {
                printf("%d ", a);
                c=a+b; a=b; b=c;
            } break;
        case 3:
            for(i=2; i*i<=n; i++) {
                if(n%i==0) { flag=0; break; }
            }
            if(flag) printf("Prime");
            else printf("Not"); break;
    }
    return 0;
}
```

46. Count vowels, consonants, digits

```
#include<stdio.h>
#include<string.h>
int main(){
    char s[100];
    int v=0, c=0, d=0, i;
    scanf("%s", s);
    for(i=0; s[i]!=''; i++) {
        if(s[i]=='a'||s[i]=='e'||s[i]=='i'||
           s[i]=='o'||s[i]=='u'||s[i]=='A'||
           s[i]=='E'||s[i]=='I'||s[i]=='O'||
           s[i]=='U') v++;
        else if((s[i]>='a'&&s[i]<='z')||
                (s[i]>='A'&&s[i]<='Z')) c++;
        else if(s[i]>='0'&&s[i]<='9') d++;
    }
    printf("V:%d C:%d D:%d", v, c, d);
    return 0;
}
```

47. Reverse number or string

```
#include<stdio.h>
#include<string.h>
int main(){
    int ch;
    printf("1-Num 2-Str
");
    scanf("%d", &ch);
    switch(ch) {
        case 1: {
            int n, rev=0;
            scanf("%d", &n);
            while(n>0) {
                rev=rev*10+n%10;
                n/=10;
            }
            printf("%d", rev); break;
        }
        case 2: {
            char s[100];
            scanf("%s", s);
            strrev(s);
            printf("%s", s); break;
        }
    }
    return 0;
}
```

48. Matrix operations

```
#include<stdio.h>
int main(){
    int ch, r, c, i, j;
    printf("1-Add 2-Sub
");
    scanf("%d %d %d", &ch, &r, &c);
    int a[r][c], b[r][c], res[r][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++)
            scanf("%d", &b[i][j]);
    switch(ch) {
        case 1:
            for(i=0; i<r; i++)
                for(j=0; j<c; j++)
                    res[i][j]=a[i][j]+b[i][j]; break;
        case 2:
            for(i=0; i<r; i++)
                for(j=0; j<c; j++)
                    res[i][j]=a[i][j]-b[i][j]; break;
    }
    for(i=0; i<r; i++) {
        for(j=0; j<c; j++)
            printf("%d ", res[i][j]);
        printf("
");
    }
    return 0;
}
```

49. Array operations

```
#include<stdio.h>
int main(){
    int ch, n, i, sum=0, max, min;
    printf("1-Sum 2-Max 3-Min
");
    scanf("%d %d", &ch, &n);
    int a[n];
    for(i=0; i<n; i++)
        scanf("%d", &a[i]);
    switch(ch) {
        case 1:
            for(i=0; i<n; i++) sum+=a[i];
            printf("%d", sum); break;
        case 2:
            max=a[0];
            for(i=1; i<n; i++)
                if(a[i]>max) max=a[i];
            printf("%d", max); break;
        case 3:
            min=a[0];
            for(i=1; i<n; i++)
                if(a[i]<min) min=a[i];
            printf("%d", min); break;
    }
    return 0;
}
```

50. ATM menu

```
#include<stdio.h>
int main(){
    int bal=5000, ch, amt;
    while(1) {
        printf("1-Dep 2-With 3-Bal 4-Exit
");
        scanf("%d", &ch);
        switch(ch) {
            case 1:
                scanf("%d", &amt);
                bal+=amt;
                printf("Deposited
"); break;
            case 2:
                scanf("%d", &amt);
                if(amt<=bal) {
                    bal-=amt;
                    printf("Withdrawn
");
                }
                else printf("Insufficient
"); break;
            case 3:
                printf("Balance: %d
", bal); break;
            case 4:
                return 0;
        }
    }
}
```

3. LOOP PROGRAMS (1-22)

1. Print 1 to 10

```
#include<stdio.h>
int main(){
    int i;
    for(i=1; i<=10; i++)
        printf("%d
", i);
    return 0;
}
```

2. Print 10 to 1

```
#include<stdio.h>
int main(){
    int i;
    for(i=10; i>=1; i--)
        printf("%d
", i);
    return 0;
}
```

3. Print even 1 to 100

```
#include<stdio.h>
int main(){
    int i;
    for(i=2; i<=100; i+=2)
        printf("%d
", i);
    return 0;
}
```

4. Print odd 1 to 100

```
#include<stdio.h>
int main(){
    int i;
    for(i=1; i<=100; i+=2)
        printf("%d
", i);
    return 0;
}
```

5. Multiplication table

```
#include<stdio.h>
int main(){
    int n, i;
    scanf("%d", &n);
    for(i=1; i<=10; i++)
        printf("%d*%d=%d
", n, i, n*i);
    return 0;
}
```

6. Find factorial

```
#include<stdio.h>
int main(){
    int n, i, fact=1;
    scanf("%d", &n);
    for(i=1; i<=n; i++)
        fact*=i;
    printf("%d", fact);
    return 0;
}
```

7. Sum of first N natural

```
#include<stdio.h>
int main(){
    int n, i, sum=0;
    scanf("%d", &n);
    for(i=1; i<=n; i++)
        sum+=i;
    printf("%d", sum);
    return 0;
}
```

8. Sum of squares

```
#include<stdio.h>
int main(){
    int n, i, sum=0;
    scanf("%d", &n);
    for(i=1; i<=n; i++)
        sum+=i*i;
    printf("%d", sum);
    return 0;
}
```

9. Sum of cubes

```
#include<stdio.h>
int main(){
    int n, i, sum=0;
    scanf("%d", &n);
    for(i=1; i<=n; i++)
        sum+=i*i*i;
    printf("%d", sum);
    return 0;
}
```

10. Reverse a number

```
#include<stdio.h>
int main(){
    int n, rev=0, r;
    scanf("%d", &n);
    while(n>0) {
        r=n%10;
        rev=rev*10+r;
        n/=10;
    }
    printf("%d", rev);
    return 0;
}
```

11. Count digits

```
#include<stdio.h>
int main(){
    int n, count=0;
    scanf("%d", &n);
    while(n>0) {
        count++;
        n/=10;
    }
    printf("%d", count);
    return 0;
}
```

12. Sum of digits

```
#include<stdio.h>
int main(){
    int n, sum=0, r;
    scanf("%d", &n);
    while(n>0) {
        r=n%10;
        sum+=r;
        n/=10;
    }
    printf("%d", sum);
    return 0;
}
```

13. Product of digits

```
#include<stdio.h>
int main(){
    int n, prod=1, r;
    scanf("%d", &n);
    while(n>0) {
        r=n%10;
        prod*=r;
        n/=10;
    }
    printf("%d", prod);
    return 0;
}
```

14. Check palindrome

```
#include<stdio.h>
int main(){
    int n, temp, rev=0, r;
    scanf("%d", &n);
    temp=n;
    while(temp>0) {
        r=temp%10;
        rev=rev*10+r;
        temp/=10;
    }
    if(n==rev) printf("Palindrome");
    else printf("Not palindrome");
    return 0;
}
```

15. Check Armstrong

```
#include<stdio.h>
#include<math.h>
int main(){
    int n, temp, sum=0, r, d=0;
    scanf("%d", &n);
    temp=n;
    while(temp>0) {
        d++;
        temp/=10;
    }
    temp=n;
    while(temp>0) {
        r=temp%10;
        sum+=pow(r, d);
        temp/=10;
    }
    if(sum==n) printf("Armstrong");
    else printf("Not Armstrong");
    return 0;
}
```

16. Check perfect number

```
#include<stdio.h>
int main(){
    int n, i, sum=0;
    scanf("%d", &n);
    for(i=1; i<n; i++) {
        if(n%i==0)
            sum+=i;
    }
    if(sum==n) printf("Perfect");
    else printf("Not perfect");
    return 0;
}
```

17. Check prime

```
#include<stdio.h>
int main(){
    int n, i, flag=1;
    scanf("%d", &n);
    if(n<=1) flag=0;
    else {
        for(i=2; i*i<=n; i++) {
            if(n%i==0) {
                flag=0;
                break;
            }
        }
    }
    if(flag) printf("Prime");
    else printf("Not prime");
    return 0;
}
```

18. Prime in range

```
#include<stdio.h>
int main(){
    int a, b, i, j, flag;
    scanf("%d %d", &a, &b);
    for(i=a; i<=b; i++) {
        flag=1;
        if(i<=1) flag=0;
        else {
            for(j=2; j*j<=i; j++) {
                if(i%j==0) {
                    flag=0;
                    break;
                }
            }
        }
        if(flag) printf("%d ", i);
    }
    return 0;
}
```

19. Fibonacci series

```
#include<stdio.h>
int main(){
    int n, a=0, b=1, c, i;
    scanf("%d", &n);
    for(i=0; i<n; i++) {
        printf("%d ", a);
        c=a+b;
        a=b;
        b=c;
    }
    return 0;
}
```

20. Sum of Fibonacci

```
#include<stdio.h>
int main(){
    int n, a=0, b=1, c, i, sum=0;
    scanf("%d", &n);
    for(i=0; i<n; i++) {
        sum+=a;
        c=a+b;
        a=b;
        b=c;
    }
    printf("%d", sum);
    return 0;
}
```

21. Arithmetic progression

```
#include<stdio.h>
int main(){
    int first, diff, n, i;
    scanf("%d %d %d", &first, &diff, &n);
    for(i=0; i<n; i++)
        printf("%d ", first+i*diff);
    return 0;
}
```

22. Geometric progression

```
#include<stdio.h>
int main(){
    int first, ratio, n, i;
    scanf("%d %d %d", &first, &ratio, &n);
    for(i=0; i<n; i++)
        printf("%d ", first*ratio*ratio);
    return 0;
}
```