1. WAP to check for a valid triangle

```
#include <stdio.h>
int main(){
   int a,b,c;
   printf("Enter the sides\n");
   printf("SIDE A=");
   scanf("%d",&a);
   printf("SIDE B=");
   scanf("%d",&b);
   printf("SIDE C=");
   scanf("%d",&c);

   if ((a + b > c) && (a + c > b) && (b + c > a))
      printf("sides are valid\n");

   printf("Program execution is over");
   return 0;


}
```

OUTPUT

```
Enter the sides
SIDE A=3
SIDE B=4
SIDE C=5
sides are valid

Enter the sides
SIDE A=1
SIDE B=2
```

SIDE C=3

Program execution is over

2. WAP to check if character is an alphabet

```
#include<stdio.h>
int main(){
   char a;
   printf("enter a character\n");
   scanf("%c",&a);
   if (a>='A' && a<='Z'||a>='a' && a<='z')
      printf("%c is a character\n",a);
   printf("Program execution is over");
   return 0;



}
```

OUTPUT

enter a character

a

a is a character

Program execution is over

enter a character

H

H is a character

Program execution is over

enter a character

1

Program execution is over

3. WAP to check if a year is a leap year

```
#include<stdio.h>
int main(){
   int year;
   printf("enter a year to check\n");
   scanf("%d",&year);

   if ((year % 4 == 0 && year % 100 != 0) || (year % 400 == 0))
      printf("%d is a leap year\n",year);
   printf("Program execution is over");

   return 0;
}
```

OUTPUT

enter a year to check

2024

2024 is a leap year

Program execution is over

enter a year to check

2021

Program execution is over

4. WAP to check if a number is divisible by 3

```
#include<stdio.h>
int main(){
   int num;
   printf("enter the number to check\n");
   scanf("%d",&num);
   if(num%3==0)
      printf("Number is divisible by 3\n");
   printf("Program execution is over");
   return 0;
}
```

OUTPUT

```
enter the number to check
369
Number is divisible by 3
Program execution is over

enter the number to check
50
Program execution is over
```

5. WAP to check for uppercase characters.

```
#include<stdio.h>
int main(){
   char a;
   printf("enter a character\n");
```

```
    scanf("%c",&a);
    if (a>='A' && a<='Z')
        printf("%c is an uppercase character\n",a);
    printf("Program execution is over");
    return 0;

}
```

OUTPUT

```
enter a character
H
H is an uppercase character
Program execution is over

enter a character
m
Program execution is over
```

6. WAP to check for special character

```
#include<stdio.h>
int main(){
    char a;
    printf("enter a character\n");
    scanf("%c",&a);
    if (!(a>='A' && a<='Z'||a>='a' && a<='z'|| a>='0' && a<='9'))
        printf("%c it is a special character\n",a);
    printf("pgm excecution completed");
    return 0;
```

}

OUTPUT

enter a character

&

& it is a special character

pgm excecution completed

enter a character

5

pgm excecution completed

7.ELECTRICITY BILL CALCULATOR

WAP to calculate the electricity bill based on the formula mentioned below

Calculations

To calculate your electricity bill, follow these steps:

Watts = (amps) x (volts)

Kilowatt-hours = (watts) x (usage) / 1000.

Cost = (kilowatt-hours) x (electricity rate)

1. Subtract the current meter reading from the previous month's reading to find the energy consumption.

2. Multiply the units consumed by the per-unit charges based on the applicable slabs (e.g., Rs. 4.22 for 1-100 units,

Rs. 5.02 for 101-200 units).

3. Add the fixed charge and energy duty (e.g., Rs. 40 fixed charge and Rs. 0.15 per unit) to the energy charges.

4. The sum of the energy charges, fixed charge, and energy duty gives you the total bill amount.

Example: If you consumed 250 units with the applicable slabs mentioned above, the energy charges would be Rs. 1218.

Adding the fixed charge and energy duty, the total bill amount would be Rs. 1296.

```
#include <stdio.h>

int main()
{
  float amps,volts,watts,prev_month,current_month,usage,rate,kilowatt_hours,cost,fixed_rate=40.0,energy_duty;

  printf("Enter Amplitude and Voltage");
  scanf("%f%f",&amps,&volts);

  printf("Previous Month reading=");
  scanf("%f",&prev_month);
  printf("Current Month reading=");
  scanf("%f",&current_month);

  usage=current_month - prev_month;
  if(usage<0){
     printf("Current month reading should not less than previous month reading");
     return 1;
  }

  watts=amps*volts;
  kilowatt_hours = watts * usage / 1000;


  if (kilowatt_hours>=1 && kilowatt_hours<=100){
     rate=4.22;
  }else if(kilowatt_hours>100 && kilowatt_hours<=200){
```

```
    rate=5.02;
  }else if(kilowatt_hours>200){
    rate=5.82;
  }else{
    printf("Invalid reading");
    return 1;
  }



  cost=kilowatt_hours*rate+fixed_rate+(kilowatt_hours*0.15);
  printf("Total Bill Amount=%.2f",cost);



}
```

Output

```
Enter Amplitude and Voltage 5
8
Previous Month reading=500
Current Month reading=1000
Total Bill Amount=127.40
```

8.SIMPLE CALCULATOR USING SWITCH-CASE

```
#include <stdio.h>

int main() {
   char operator;
   int num1, num2, result;
```

```
printf("Enter an operator (+, -, *, /,%%): ");
scanf(" %c", &operator);

printf("Enter two numbers: ");
scanf("%d %d", &num1, &num2);



switch (operator) {
   case '+':
      result = num1 + num2;
      printf("%d + %d = %d\n", num1, num2, result);
      break;
   case '-':
      result = num1 - num2;
      printf("%d - %d = %d\n", num1, num2, result);
      break;
   case '*':
      result = num1 * num2;
      printf("%d * %d = %d\n", num1, num2, result);
      break;
   case '/':
      if (num2 != 0) {
         result = num1 / num2;
         printf("%d / %d = %d\n", num1, num2, result);
      } else {
         printf("Error: Division by zero is not allowed.\n");
      }
      break;
   case '%':
```

```
        if (num2 != 0) {
            result = num1 % num2;
            printf("%d %% %d = %d\n", num1, num2, result);
        } else {
            printf("Error: Division by zero is not allowed.\n");
        }
        break;
    default:
        printf("Error: Invalid operator.\n");
  }

  return 0;
}
```

Output

```
Enter an operator (+, -, *, /,%): %
Enter two numbers: 20
18
20 % 18 = 2

Enter an operator (+, -, *, /,%): +
Enter two numbers: 1000
2000
1000 + 2000 = 3000
```

9. BASIC PAY CALCULATOR

In this challenge you are to create a c program that calculates your weekly pay

the program should ask the user to enter the number of hours worked in a week via the keyboard

// the program should display as output the gross pay.the taxes,and the net pay

```
// following assumption should be made
// basic pay rate=$12.00/hr
// overtime(if exceeds of 40 hours)=time and a half
// taxrate:
// 15% of the first $300
// 20% of the next $150
// 25% of the rest



#include <stdio.h>

int main() {
   float basic_pay_rate = 12.00;
   float overtime_rate = 1.5 * basic_pay_rate;
   int regular_hours = 40;
   float tax_300 = 0.15;
   float tax_150 = 0.20;
   float tax_rest = 0.25;



   float hours_worked, gross_pay, taxes = 0.0, net_pay;


   printf("Enter the number of hours worked in a week: ");
   scanf("%f", &hours_worked);


   if (hours_worked <= regular_hours) {
      gross_pay = hours_worked * basic_pay_rate;
   } else {
      gross_pay = (regular_hours * basic_pay_rate) + ((hours_worked - regular_hours) *
overtime_rate);
   }
```

```
    if (gross_pay <= 300) {
        taxes = gross_pay * tax_300;
    } else if (gross_pay <= 450) {
        taxes = (300 * tax_300) + ((gross_pay - 300) * tax_150);
    } else {
        taxes = (300 * tax_300) + (150 * tax_150) + ((gross_pay - 450) * tax_rest);
    }



    net_pay = gross_pay - taxes;

    printf("Gross Pay: $%.2f\n", gross_pay);
    printf("Taxes: $%.2f\n", taxes);
    printf("Net Pay: $%.2f\n", net_pay);

    return 0;
}
```

Output

```
Enter the number of hours worked in a week: 45
Gross Pay: $570.00
Taxes: $105.00
Net Pay: $465.00

Enter the number of hours worked in a week: 40
Gross Pay: $480.00
Taxes: $82.50
Net Pay: $397.50
```

10. WAP to print Fibonacci Series up to a Given Number

```
#include <stdio.h>
int main() {
   int n, num1 = 0, num2 = 1, next_num;
   printf("Enter a number: ");
   scanf("%d", &n);
   if (n < 0) {
      printf("Error: Negative numbers are not supported.");
      return 1;
   }

   printf("Fibonacci Series up to %d: ", n);
   printf("%d, %d, ", num1, num2);

   next_num = num1 + num2;
   while (next_num <= n) {
      printf("%d, ", next_num);
      num1 = num2;
      num2 = next_num;
      next_num = num1 + num2;
   }

   return 0;
}
```

Output

Enter a number: 5

Fibonacci Series up to 5: 0, 1, 1, 2, 3, 5,

Enter a number: 0

Fibonacci Series up to 0: 0, 1,

11. WAP to print factorial of a number

```
#include <stdio.h>

int main() {
   int num, factorial = 1;

   printf("Enter a number: ");
   scanf("%d", &num);
   while (num > 0) {
      factorial *= num;
      num--;
   }

   printf("Factorial: %d\n", factorial);
   return 0;
}
```

Output

Enter a number: 5

Factorial: 120

12. WAP to check whether the number is Prime or not.

```
#include <stdio.h>
int main() {
```

```
    int num, i = 2, flag = 1;
    printf("Enter a number: ");
    scanf("%d", &num);
    if (num < 2) {
        printf("%d is not a prime number.", num);
        return 0;
    }
    while (i * i <= num) {
        if (num % i == 0) {
            flag = 0;
            break;
        }
        i++;
    }
    if (flag) {
        printf("%d is a prime number.", num);
    } else {
        printf("%d is not a prime number.", num);
    }

    return 0;
}
```

Output

```
Enter a number: 8
8 is not a prime number.

Enter a number: 7
7 is a prime number.
```

13. WAP to print lower case alphabets.

```
#include <stdio.h>
int main() {
   char c = 'a';
   while (c <= 'z') {
      printf("%c ", c);
      c++;
   }

   return 0;
}
```

Output

```
a b c d e f g h i j k l m n o p q r s t u v w x y z
```

CLASS PROGRAMS

// write a program to check whether a number is even the pgm will ask for user input for integer

```
#include<stdio.h>
int main(){
   int num;
   printf("enter a number to check\n");
   scanf("%d",&num);
   if (num%2==0)
     printf("The number %d is even\n",num);
   printf("Program execution is over");
```

```
    return 0;

}

//write a program to count a digit

#include<stdio.h>
int main(){
    int num,count=0;

    printf("Enter a number");
    scanf("%d",&num);

    while(num>0){
        num=num/10;
        count++;
    }

    printf("count=%d",count);

}


//pgm to find a sign of a value


#include<stdio.h>
int main(){
    int number,sign;
    printf("Enter a number to check\n");
    scanf("%i",&number);
```

```
    if(number<0){
        sign=-1;
    }else if(number==0){
        sign=0;

    }else{
        sign=1;
    }
printf("the sign of the value is %d",sign);
return 0;

}

// write a program to check whether a number is even the pgm will ask for user input for integer

#include<stdio.h>
int main(){
    int num;
    printf("enter a number to check\n");
    scanf("%d",&num);
    if (num%2==0)
       printf("The number %d is even\n",num);
    printf("Program execution is over");
    return 0;

}

//WAP to determine the grade of a student based on following
/*
Grade A=marks>90
Grade B=marks>=80 and marks<90
```

Grade C=marks>=70 and marks<80

Grade D=marks>=60 and marks<70

Grade F=marks<60

inputs: marks

comparison: >= , <,&&

control statements: else if ladder

How many variable: 1

Datatype of variables: int

scope: Local Scope

*/

```
#include<stdio.h>
int main(){
   int marks;
   printf("Enter the marks obtained\n");
   scanf("%d",&marks);

   if(marks>90){
      printf("Grade A");
   }else if(marks>=80 && marks<90){
      printf("Grade B");
   }else if(marks>=70 && marks<80){
      printf("Grade C");
   }else if(marks>=60 && marks<70){
      printf("Grade D");
   }else if(marks>0 && marks<60){
```

```
        printf("Grade F");
    }else{
        printf("plsase enter valid marks");
    }

  return 0;
}

//WAP to check largest of 3 numbers

/*
inputs: num1, num2,num3
comparison: >
control statements: else if ladder
How many variable: 3
Datatype of variables:  int
scope: Local Scope
*/

#include<stdio.h>
int main(){
    int num1,num2,num3;
    printf("Enter three numbers\n");
    scanf("%d%d%d",&num1,&num2,&num3);
    if(num1>num2&&num1>num3){
        printf("%d is greater",num1);
    }else if(num2>num1&&num2>num3){
        printf("%d is greater",num2);
    }else{
        printf("%d is greater",num3);
    }
```

```
}

//WAP to check voting elegibility

/*
inputs: age
comparison: >=
control statements: if....else
How many variable: 1
Datatype of variables:  int
scope: Local Scope
*/


#include<stdio.h>
int main(){
   int age;
   printf("Enter the age:\n");
   scanf("%d",&age);
   if(age>=18){
      Printf("You are eligible for vote");
   }else{
      printf("you are not eligible for vote ");
   }
return 0;
}

// write a pgm to print upto a given number

#include<stdio.h>
int main(){
```

```
    int limit,i=0;

    printf("Enter the limit");
    scanf("%d",&limit);

    while(i<=limit){
        printf("%d ->",i);
        i+=2;
    }


}

//WAP to reverse a number


#include<stdio.h>
int main(){
    int num;

    printf("Enter a number to reverse");
    scanf("%d",&num);
    int rev=0;

    while(num>0){
        int reminder=num%10;
        rev=rev*10+reminder;
        num=num/10;

    }
    printf("reversed = %d",rev);
```

```
}
```

//WAP to find sum of natural numbers

```
#include<stdio.h>
int main(){
   int limit;
   int sum=0;
   int i=0;

   printf("Enter the limit:\n");
   scanf("%d",&limit);

   while(i<=limit){
      sum=sum+i;
      i++;
   }
   printf("summation value=%d",sum);
   return 0;
}
```

//SWITCH EXAMPLE PROGRAM

```
#include<stdio.h>
int main(){
   int num;
```

```
    printf("Enter the number between 1 t0 4");
    scanf("%d",&num);

    switch (num){
        case '1':
          printf("1 is entered\n");
          break;
        case 2:
          printf("2 is entered\n");
          break;
        case 3:
          printf("3 is entered\n");
          break;
        case 4:
          printf("4 is entered\n");
          break;
        default:
        printf("wrong number\n");


    }
}


//print numbers using while loop

#include<stdio.h>
// #include<stdint.h>
int main(){

    int i=1;
```

```
    while(i<=10){
        printf("%d\n",i++);
    }
    return 0;
}
```