1. **Write a program to check for a valid traingle.**

```
#include <stdio.h>

int main() {
  int side1, side2, side3;

  printf("Enter the three sides of the triangle: ");
  scanf("%d %d %d", &side1, &side2, &side3);

  if (side1 + side2 > side3 && side1 + side3 > side2 && side2 + side3 > side1) {
    printf("It is a valid triangle.\n");
  }
else {
    printf("It is not a valid triangle.\n");
  }

  return 0;
}
```

OUTPUT

```
Enter the three sides of the triangle: 5
5
5
It is a valid triangle.
```

2. **Write a program to check if a character is an Alphabet.**

```
#include <stdio.h>

int main() {
  char ch;

  printf("Enter a character: ");
  scanf(" %c", &ch);
```

```
    if ((ch >= 'A' && ch <= 'Z') || (ch >= 'a' && ch <= 'z')) {
        printf("It is an alphabet.\n");
    } else {
        printf("It is not an alphabet.\n");
    }

    return 0;
}
```

OUTPUT

Enter a character: G

It is an alphabet.

3.Write a program to check if a Year is a leap Year.

```
#include <stdio.h>

int main() {
int year;

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

if ((year % 4 == 0 && year % 100 != 0) || (year % 400 == 0)) {
printf("It is a leap year.\n");
} else {
printf("It is not a leap year.\n");
}
```

```
return 0;
}
```

OUTPUT

Enter a year: 2000

It is a leap year.

4.Write a program to check if a number is divisible by 3.

```
#include <stdio.h>

int main() {
   int num;

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

   if (num % 3 == 0) {
      printf("The number is divisible by 3.\n");
   } else {
      printf("The number is not divisible by 3.\n");
   }

   return 0;
}
```

OUTPUT

Enter a number: 21

The number is divisible by 3.

5.Write a program to check for Uppercase Characters.

```
#include <stdio.h>

int main() {
   char ch;

   printf("Enter a character: ");
   scanf(" %c", &ch);

   if (ch >= 'A' && ch <= 'Z') {
      printf("It is an uppercase character.\n");
   } else {
      printf("It is not an uppercase character.\n");
   }

   return 0;
}
```

OUTPUT

```
Enter a character: Y
It is an uppercase character.

Enter a character: a
It is not an uppercase character.
```

6.Write a program to check for Special character.

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

```
int main() {
   char ch;

   printf("Enter a character: ");
   scanf(" %c", &ch);

   if (!((ch >= 'A' && ch <= 'Z') || (ch >= 'a' && ch <= 'z') || (ch >= '0' && ch <= '9'))) {
      printf("It is a special character.\n");
   } else {
      printf("It is not a special character.\n");
   }

   return 0;
}
```

OUTPUT

Enter a character: &

It is a special character.

7. write a program to determine largest of 3 numbers.

```
#include <stdio.h>

int main() {
   int num1, num2, num3;

   printf("Enter three numbers: ");
   scanf("%d %d %d", &num1, &num2, &num3);
```

```
    if (num1 >= num2 && num1 >= num3) {
        printf("%d is largest", num1);
    } else if (num2 >= num1 && num2 >= num3) {
        printf("%d is largest", num2);
    } else {
        printf("%d is largest", num3);
    }

    return 0;
}
// Inputs:num1, num2, num3
Comparison: >=
Control statements: if...else
 How many variables: 3
Datatype of the variable: int
Prefered Scope of the variable: local //
OUTPUT
Enter three numbers: 24
25
3
25 is largest
```

8.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() {
   int previousReading, currentReading, unitsConsumed;
   float energyCharges = 0, fixedCharge = 40.0, energyDuty = 0.15;
   float totalBillAmount;

   printf("Enter previous month's meter reading: ");
   scanf("%d", &previousReading);

   printf("Enter current month's meter reading: ");
   scanf("%d", &currentReading);

   unitsConsumed = currentReading - previousReading;

   if (unitsConsumed <= 100) {
      energyCharges = unitsConsumed * 4.22;
   } else if (unitsConsumed <= 200) {
      energyCharges = (100 * 4.22) + ((unitsConsumed - 100) * 5.02);
   } else {
      energyCharges = (100 * 4.22) + (100 * 5.02) + ((unitsConsumed - 200) * 6.00);
   }

   totalBillAmount = energyCharges + fixedCharge + (unitsConsumed * energyDuty);

   printf("Total bill amount: Rs. %.2f\n", totalBillAmount);

   return 0;
```

}

OUTPUT

Enter previous month's meter reading: 1200
Enter current month's meter reading: 1450
Total bill amount: Rs. 1301.50

9. 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 The following assumptions should be made: • Basic pay rate = $12.00/hr • Overtime (in excess of 40 hours) = time and a half • Tax rate: • 15% of the first $300 • 20% of the next $150 • 25% of the rest • You will need to utilize if/else statements

```
#include <stdio.h>

int main() {
  float hoursWorked, grossPay, taxes, netPay;
  float basicPayRate = 12.00, overtimeRate = 18.00;

  printf("Enter hours worked in a week: ");
  scanf("%f", &hoursWorked);

  if (hoursWorked > 40)
    grossPay = (40 * basicPayRate) + ((hoursWorked - 40) * overtimeRate);
  else
    grossPay = hoursWorked * basicPayRate;

  if (grossPay <= 300)
    taxes = grossPay * 0.15;
  else if (grossPay <= 450)
    taxes = (300 * 0.15) + ((grossPay - 300) * 0.20);
  else
    taxes = (300 * 0.15) + (150 * 0.20) + ((grossPay - 450) * 0.25);

  netPay = grossPay - taxes;

  printf("Gross pay: $%.2f\n", grossPay);
  printf("Taxes: $%.2f\n", taxes);
  printf("Net pay: $%.2f\n", netPay);

  return 0;
}
```

OUTPUT

Enter hours worked in a week: 40
Gross pay: $480.00
Taxes: $82.50
Net pay: $397.50

10. WAP to determine the grade of a student based on following Grade A = marks >= 90 Grade B = marks >= 80 and marks = 70 and marks = 60 and marks < 60

```
#include <stdio.h>

int main() {
   int mark;
   printf("Enter the mark: ");
   scanf("%d", &mark);

   if (mark >= 90) {
      printf(" GRADE A\n");
   }
   else if ((mark >= 80) && (mark < 90)) {
      printf("GRADE B\n");
   } else if ((mark >= 70) && (mark < 80)) {
      printf("GRADE C\n");
   } else if ((mark >= 60) && (mark < 70)) {
      printf("GRADE D\n");
   } else {
      printf("GRADE F\n");
   }

   return 0;
}
```

OUTPUT

Enter the mark: 75
GRADE C

11. WAP using switch case for calculator - when you press + Addition of two numbers - when you press - Subtraction of two numbers - when you press * Multiplication of two numbers - when you press / Division of two numbers - when you press % Modulo operation should happen

```
#include <stdio.h>

int main() {
   int num1, num2;
```

```
  char operator;


  printf("Enter first number: ");
  scanf("%d", &num1);
  printf("Enter second number: ");
  scanf("%d", &num2);
  printf("Enter operator: ");
  scanf(" %c", &operator);
  switch (operator) {
    case '+':
      printf("%d + %d = %d\n", num1, num2, num1 + num2);
      break;
    case '-':
      printf("%d - %d = %d\n", num1, num2, num1 - num2);
      break;
    case '*':
      printf("%d * %d = %d\n", num1, num2, num1 * num2);
      break;
    case '/':
      printf("%d / %d = %d\n", num1, num2, num1 / num2);
      break;
    case '%':
      printf("%d %% %d = %d\n", num1, num2, num1 % num2);
      break;
    default:
      printf("Invalid operator!\n");
  }

  return 0;
}
```

OUTPUT

```
Enter first number: 12
Enter second number: 28
Enter operator: +
12 + 28 = 40

Enter first number: 56
Enter second number: 23
Enter operator:
*
56 * 23 = 1288
```

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

```
#include <stdio.h>

int main() {
   int n, first = 0, second = 1, next;

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

   printf("Fibonacci Series: ");
   while (first <= n) {
      printf("%d ", first);
      next = first + second;
      first = second;
      second = next;
   }

   return 0;
}
```

OUTPUT
Enter the number20
Fibonacci Series: 0 1 1 2 3 5 8 13

13.WAP to print factorial of a number.

```
 #include <stdio.h>

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

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


   while (i <= num) {
      factorial *= i;
      i++;
   }

   printf("Factorial of %d = %d\n", num, factorial);

   return 0;
}
```

OUTPUT
Enter a number: 5

Factorial of 5 = 120

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

```
#include <stdio.h>

int main() {
   int num, i = 2;

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


   while (i < num) {
      if (num % i == 0) {
         printf("%d is not a prime number.\n", num);
         return 0;
      }
      i++;
   }

   printf("%d is a prime number.\n", num);

   return 0;
}
```

OUTPUT

```
Enter a number: 12
12 is not a prime number.
```

15.WAP to print lower case alphabets.

```
#include <stdio.h>

int main() {
   char ch = 'a';

   // Using while loop to print lowercase alphabets
   while (ch <= 'z') {
      printf("%c ", ch);
      ch++;
   }
```

```
    printf("\n");
    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