C Programming Questions -19-Dec-2024

Q1 Write a program to calculate total distance between a and b? Given distance between a and c=160 and c & b=50?

```
#include<stdio.h>
Void main()
{
        unsigned char ac=160, cb=50;
        unsigned char ab=ac+cb;
        printf(“Total distance = %d”,ab);
return 0;
}
```

Q2 Program to showcase the usage of all the arithmetic operators on two defined operands?

```
#include <stdio.h>
int main()
{
   unsigned char a=100,b=30;
   unsigned char add =a+b;
   unsigned char sub =a-b;
   unsigned int mul =a*b;
   unsigned char Quotient =a/b;
   unsigned char reminder =a%b;
   unsigned char increment =++a;
   unsigned char decrement =--b;
   printf("Addition =%d \n Subtraction =%d \n Multiplication =%d \n Quotient =%d \n Reminder =%d \n increment=%d \n decrement=%d",add,sub,mul,Quotient,reminder,increment,decrement);

   return 0;
```

```
}
```

Q3 Logical Operators

```
#include <stdio.h>

int main()

{

  int a = 25, b = 5;

  printf("a < b: %d \n", a<b);

  printf("a > b: %d \n", a>b);

  printf("a <= b: %d \n", a<=b);

  printf("a >= b: %d \n", a>=b);

  printf("a != b: %d \n", a!=b);

  printf("a == b: %d \n", a==b);

  return 0;

}
```

Q4 Program showing output of && and Bit wise & operator

```
#include<stdio.h>

int main()

{

    int a=0,b=2;

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

    return 0;


}
```

Q5 Check whether a number is even or odd without using modulus operator

```
#include <stdio.h>


int main() {

    int num;

    printf("Enter a number: ");

    scanf("%d", &num);
```

```
    if (num & 1) {
        printf("%d is odd.\n", num);
    } else {
        printf("%d is even.\n", num);
    }

    return 0;
}
```

Q6 Write a program to calculate the average of five integers provided by the user?

```
#include <stdio.h>

int main() {
    int n1,n2,n3,n4,n5,sum,avg;
    printf("Enter 5 Numbers");
    scanf("%d %d %d %d %d",&n1,&n2,&n3,&n4,&n5);
    sum=n1+n2+n3+n4+n5;
    avg=sum/5;
    printf("Average of 5 numbers =%d",avg);

    return 0;
}
```

Q7 Compute and display the area and perimeter of a rectangle given its length and width.

```
#include <stdio.h>

int main() {
    unsigned int length, width, area, perimeter;
    printf("Enter the length of the rectangle: ");
    scanf("%d", &length);
    printf("Enter the width of the rectangle: ");
    scanf("%d", &width);
    area = length * width;
    perimeter = 2 * (length + width);
    printf("The area of the rectangle is: %d\n", area);
    printf("The perimeter of the rectangle is: %d\n", perimeter);
```

```
    return 0;
}
```

Q8 Write a program to calculate the compound interest using the formula:

A=P×(1+(r/100))^n; where P is the principal, r is the rate of interest, and n is the time period.

```
#include <stdio.h>
#include <math.h>
int main() {
    double principal, rate, time, amount, compound_interest;
    printf("Enter the principal amount (P): ");
    scanf("%lf", &principal);
    printf("Enter the rate of interest (r): ");
    scanf("%lf", &rate);
    printf("Enter the time period in years (n): ");
    scanf("%lf", &time);
    amount = principal * pow((1 + rate / 100), time);
    compound_interest = amount - principal;
    printf("The total amount (A) is: %.2f\n", amount);
    printf("The compound interest is: %.2f\n", compound_interest);

    return 0;
}
```

Q9 Write a program to convert a temperature from Celsius to Fahrenheit using the formula: F=(9/5)*C+32

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

```
 float celcius,fahrenheit;

 printf("Enter temperature in celcius");

 scanf("%f",&celcius);

 fahrenheit=(9/5)*celcius+32;

 printf("temperature in fahrenheit = %f",fahrenheit);}
```

Q10 Write a program to swap the values of two variables without using a third variable, relying only on arithmetic operations.

```
#include <stdio.h>

int main() {

 int a,b;

 printf("Enter a ");

 scanf("%d",&a);

  printf("Enter b ");

 scanf("%d",&b);

 a=a+b;

 b=a-b;

 a=a-b;

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

}
```

Q11 Write a program to find the sum of the digits of a given three-digit number.

```
#include <stdio.h>

int main() {

   int num, sum = 0;

   printf("Enter a three-digit number: ");

   scanf("%d", &num);

   if (num < 100 || num > 999) {

      printf("Please enter a valid three-digit number.\n");
```

```
    } else {
        sum += num % 10;
        num /= 10;
        sum += num % 10;
        num /= 10;
      sum += num % 10;
        printf("The sum of the digits is: %d\n", sum);
    }
    return 0;
}
```

Q12 Calculate the hypotenuse of a right triangle given the lengths of the other two sides using the formula: C = root over of (a^2 + b^2)

```
#include <stdio.h>
#include <math.h>
int main() {
    float a, b, c;
    printf("Enter the length of side a: ");
    scanf("%f", &a);
    printf("Enter the length of side b: ");
    scanf("%f", &b);
    c = sqrt(a * a + b * b);
    printf("The length of the hypotenuse is: %f\n", c);
}
```

Q13 Write a program to calculate the circumference and area of a circle given its radius. Use the formulas:

- Area: πr^2
- Circumference: 2πr

```
#include <stdio.h>
int main() {
    double radius, area, circumference;
```

```
    printf("Enter the radius of the circle: ");
    scanf("%lf", &radius);
    area = 3.14 * radius * radius;
    circumference = 2 * 3.14 * radius;
    printf("The area of the circle is: %0.2f\n", area);
    printf("The circumference of the circle is: %.2f\n", circumference);

    return 0;
}
```

Q14 Write a program to calculate the profit or loss made on a transaction given the cost price and selling price of an item.

```
#include <stdio.h>
int main() {
   float cost_price, selling_price, profit_loss;
   printf("Enter the cost price of the item: ");
   scanf("%f", &cost_price);
   printf("Enter the selling price of the item: ");
   scanf("%f", &selling_price);
   if (selling_price > cost_price) {
      profit_loss = selling_price - cost_price;
      printf("Profit: %.2f\n", profit_loss);
   } else if (selling_price < cost_price) {
      profit_loss = cost_price - selling_price;
      printf("Loss: %.2f\n", profit_loss);
   } else {
      printf("No profit or loss \n");
   }

   return 0;
```

```
}
```

Q15 **Compare Two Numbers:**

Write a program to check if two integers are equal, not equal, greater than, or less than each other using relational operators.

```
#include <stdio.h>

int main()

{

 int a, b;

 printf("Enter a and b");

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

 if(a==b)

 printf("a & b are equal");

 else if(a<b)

 printf("b is greater");

 else if(a>b)

 printf("a is greater");


  return 0;

}
```

Q16 **Eligibility for Voting:**

Determine whether a person is eligible to vote based on their age (age must be greater than or equal to 18).

```
#include <stdio.h>

int main() {

   int age;

   printf("Enter your age: ");

   scanf("%d", &age);

   if (age >= 18) {

      printf("You are eligible to vote.\n");

   } else {

      printf("You are not eligible to vote.\n");

   }
```

```
    return 0;
}
```

Q17 **Triangle Validity Check:**

Given three sides of a triangle, use relational operators to check if the triangle is valid (the sum of any two sides must be greater than the third side).

```
#include <stdio.h>
int main() {
    unsigned char a,b,c;
    printf("Enter the first side of the triangle: ");
    scanf("%hhu", &a);
     printf("Enter the second side of the triangle: ");
    scanf("%hhu", &b);
     printf("Enter the third side of the triangle: ");
    scanf("%hhu", &c);
    if (a+b > c && b+c > a && a+c > b) {
        printf("Triangle is valid\n");
    } else {
        printf("invalid sides.\n");
    }

    return 0;
}
```

Q18 **Student Grade Comparison:**

Compare the marks of two students to determine who scored higher, or if they have the same marks.

```
#include <stdio.h>
int main() {
    int marks1, marks2;
    printf("Enter the marks of the first student: ");
    scanf("%d", &marks1);
    printf("Enter the marks of the second student: ");
    scanf("%d", &marks2);
```

```
    if (marks1 > marks2) {
        printf("The first student scored higher with %d marks.\n", marks1);
    } else if (marks1 < marks2) {
        printf("The second student scored higher with %d marks.\n", marks2);
    } else {
        printf("Both students have the same marks: %d\n", marks1);
    }

    return 0;
}
```

Q19 **Find the Largest of Three Numbers:**

Write a program to compare three numbers and determine the largest number using relational operators.

```
#include <stdio.h>

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

    printf("Enter the first number: ");
    scanf("%d", &num1);

    printf("Enter the second number: ");
    scanf("%d", &num2);

    printf("Enter the third number: ");
    scanf("%d", &num3);

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

```
    } else {
        printf("The largest number is: %d\n", num3);
    }

    return 0;
}
```

Q20 **Leap Year Check:**

Use relational operators to determine if a given year is a leap year (divisible by 4 but not by 100 unless divisible by 400).

```
#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("%d is a leap year.\n", year);
    } else {
        printf("%d is not a leap year.\n", year);
    }

    return 0;
}
```

Q21 **Temperature Alert:**

Write a program to check if the temperature exceeds a threshold value (e.g., greater than 40 degrees Celsius) and display an alert message.

```
#include <stdio.h>
int main() {
    float temperature;
    float threshold = 40.0;
    printf("Enter the current temperature in Celsius: ");
    scanf("%f", &temperature);
    if (temperature > threshold) {
```

```
        printf("Alert: The temperature (%.2f°C) exceeds the threshold of %.2f°C!\n", temperature, threshold);
    } else {
        printf("The temperature (%.2f°C) is within the range.\n", temperature);
    }

    return 0;
}
```

Q22 **Password Strength Validation:**

Given the length of a password, check if it meets the minimum requirement of 8 characters using relational operators.

```
#include <stdio.h>
#include <string.h>
int main() {
    char password[100];
    int length;
    printf("Enter the password: ");
    scanf("%s", password);
    length = strlen(password);
    if (length >= 8) {
        printf("Password is valid \n");
    } else {
        printf("Password is too short \n");
    }
    return 0;
}
```

Q23 **Check Divisibility:**

Write a program to determine if one number is divisible by another using relational operators.

```
#include <stdio.h>
int main() {
    int num1, num2;
```

```
    printf("Enter the first number: ");
    scanf("%d", &num1);

    printf("Enter the second number: ");
    scanf("%d", &num2);



    if (num2 == 0) {
        printf("Error: Division by zero is not allowed.\n");
    } else if (num1 % num2 == 0) {
        printf("%d is divisible by %d.\n", num1, num2);
    } else {
        printf("%d is not divisible by %d.\n", num1, num2);
    }

    return 0;
}
```

Q24 **Admission Criteria:**

Check if a student meets the criteria for admission to a course based on their age (greater than or equal to 18) and marks (greater than or equal to 50).

```
#include<stdio.h>
int main()
{
    unsigned char age;
    float marks;
    printf("Enter the age of student");
    scanf("%hhu",&age);
    printf("Enter the marks obtained");
    scanf("%f",&marks);

    if(age>=18 && marks >= 50)
```

```
    printf("Student is eligible");
    else
    printf("Student is not eligible");

    return 0;

}
```