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MIS – 612303050

SY-Div 2

Question 1: Write a C program to find maximum between two numbers.

```c
// 1. Write a C program to find maximum between two numbers.

#include <stdio.h>
int findMax(int num1, int num2);
int main() {
    int num1 = 12;
    int num2 = 24;

    printf("The maximum between the two numbers is %d\n",  findMax(num1, num2));
    return 0;
}

int findMax(int num1, int num2){

    return num1 > num2 ? num1 : num2;
}
```

Output

```
Question 1>gcc .\main.c -Wall -o main
Question 1>.\main.exe
The maximum between the two numbers is 24
Question 1>
```

Question 2: Write a C program to check whether a number is negative, positive or zero.

```c
// 2. Write a C program to check whether a number is negative, positive or zero.

#include <stdio.h>
int getSign(int num);
int main() {
    int num = 0;
    char *options[] = {"Zero", "Positive", "Negative"};
    printf("The numbers is %s\n",  options[getSign(num)]);
    return 0;
}
int getSign(int num){
    if(num == 0){
        return 0;
    }else if(num > 0){
        return 1;
    }else{
        return 2;
    }
}
```

Output

```
Question 2>gcc .\main.c -Wall -o main
Question 2>.\main.exe
The numbers is Zero
Question 2>
```

Question 3: Write a C program to check whether a number is divisible by 5 and 11 or not.

```c
// 3. Write a C program to check whether a number is divisible by 5 and 11 or not.

#include <stdio.h>
int checkDivisibility(int num);
int main() {
    int num = 55;
    int divisibility = checkDivisibility(num);
    printf("%d %s divisible by 5 and 11\n", num, divisibility == 1? "is" : "is not");
    return 0;
}
int checkDivisibility(int num){
    return (num % 5 == 0) && (num % 11 == 0);
}
```

Output

```
Question 3>gcc .\main.c -Wall -o main
Question 3>.\main.exe
55 is divisible by 5 and 11
Question 3>
```

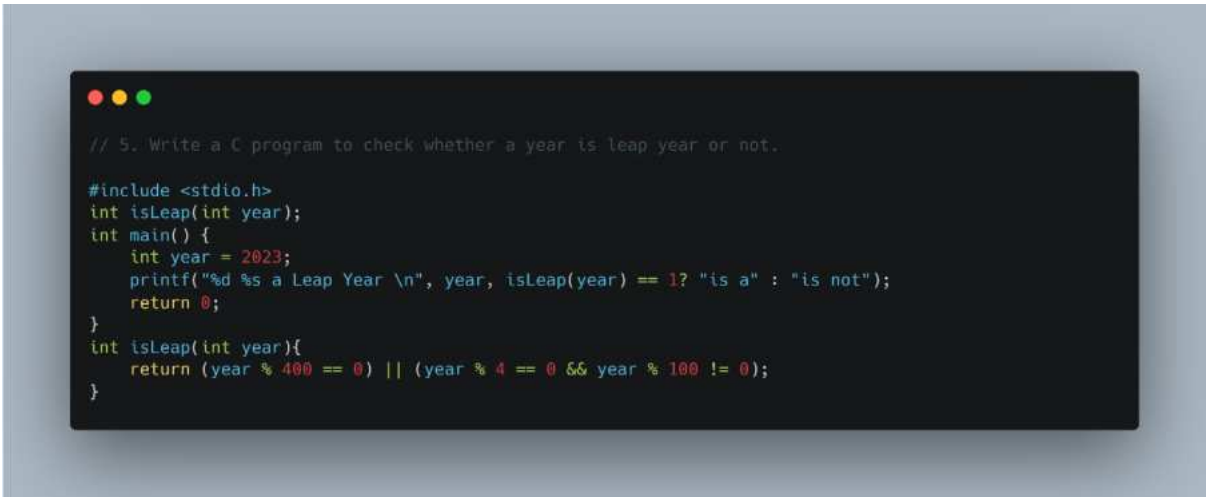
Question 4: Write a C program to check whether a number is even or odd.

```c
//4. Write a C program to check whether a number is even or odd.

#include <stdio.h>
int checkEven(int num);
int main() {
    int num = 54;
    int isEven = checkEven(num);
    printf("%d is an %s Number\n", num, isEven == 1? "Even" : "Odd");
    return 0;
}
int checkEven(int num){
    return (num % 2 == 0);
}
```

Output

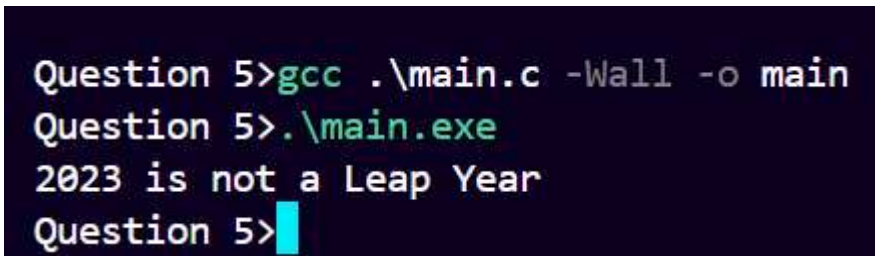
```
Question 4>gcc .\main.c -Wall -o main
Question 4>.\main.exe
54 is an Even Number
Question 4>
```

Question 5: Write a C program to check whether a year is leap year or not.



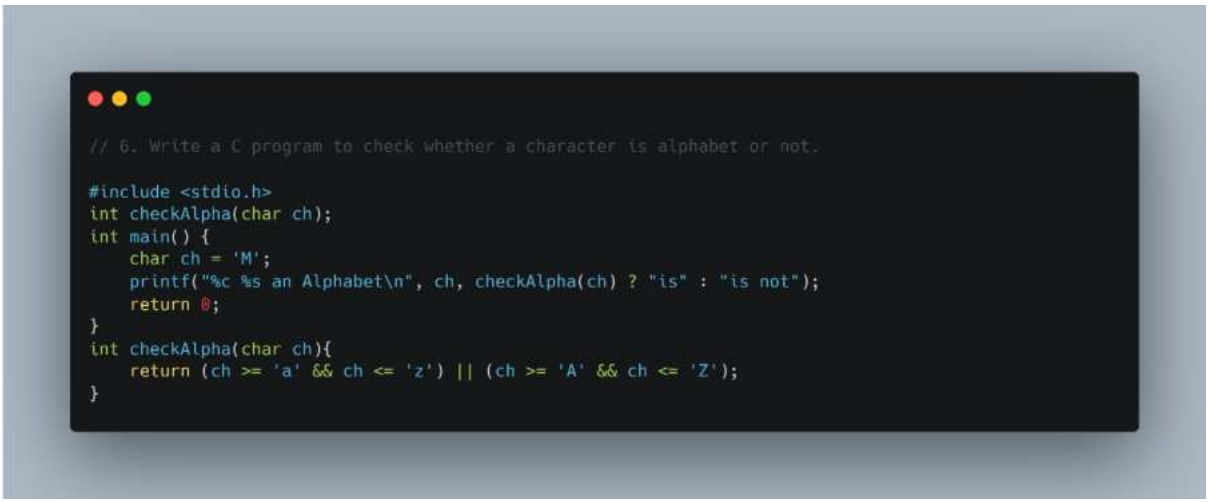
```c
// 5. Write a C program to check whether a year is leap year or not.

#include <stdio.h>
int isLeap(int year);
int main() {
    int year = 2023;
    printf("%d %s a Leap Year \n", year, isLeap(year) == 1? "is a" : "is not");
    return 0;
}
int isLeap(int year){
    return (year % 400 == 0) || (year % 4 == 0 && year % 100 != 0);
}
```

Output



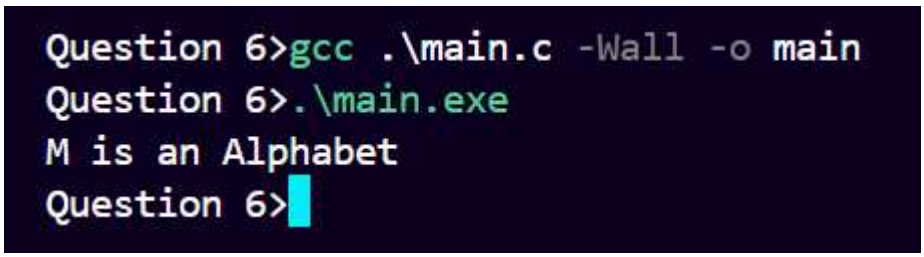
```
Question 5>gcc .\main.c -Wall -o main
Question 5>.\main.exe
2023 is not a Leap Year
Question 5>
```

Question 6: Write a C program to check whether a character is alphabet or not.



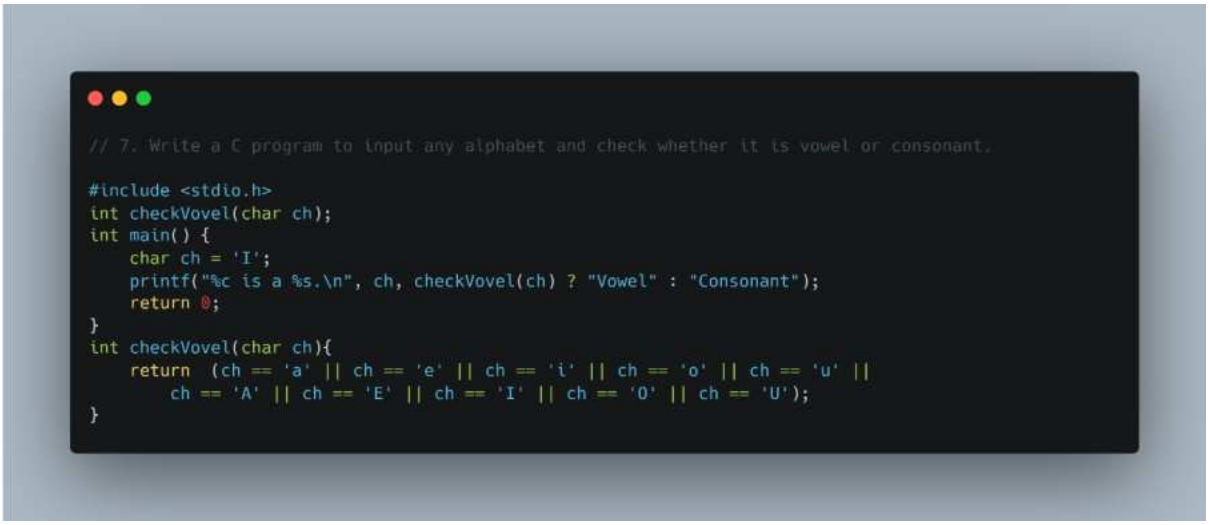
```c
// 6. Write a C program to check whether a character is alphabet or not.

#include <stdio.h>
int checkAlpha(char ch);
int main() {
    char ch = 'M';
    printf("%c %s an Alphabet\n", ch, checkAlpha(ch) ? "is" : "is not");
    return 0;
}
int checkAlpha(char ch){
    return (ch >= 'a' && ch <= 'z') || (ch >= 'A' && ch <= 'Z');
}
```

Output



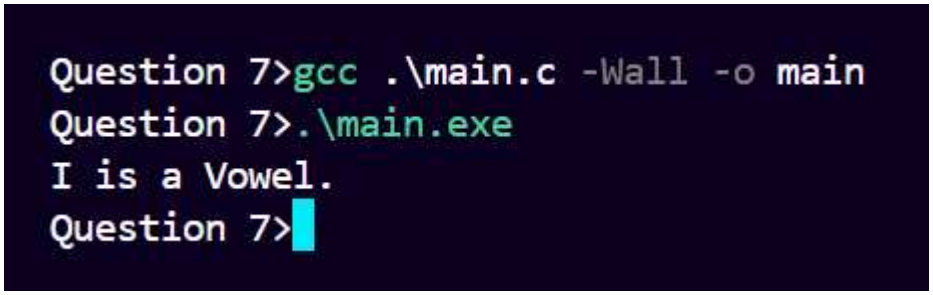
```
Question 6>gcc .\main.c -Wall -o main
Question 6>.\main.exe
M is an Alphabet
Question 6>
```

Question 7: Write a C program to input any alphabet and check whether it is vowel or consonant.



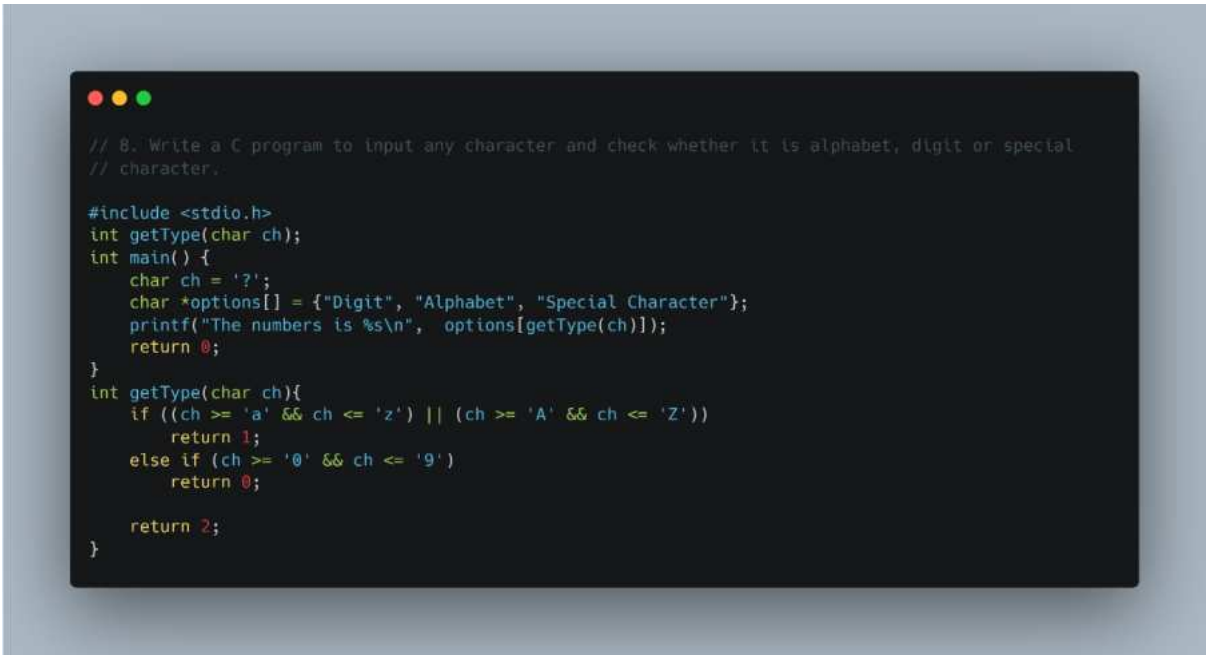
```c
// 7. Write a C program to input any alphabet and check whether it is vowel or consonant.

#include <stdio.h>
int checkVovel(char ch);
int main() {
    char ch = 'I';
    printf("%c is a %s.\n", ch, checkVovel(ch) ? "Vowel" : "Consonant");
    return 0;
}
int checkVovel(char ch){
    return  (ch == 'a' || ch == 'e' || ch == 'i' || ch == 'o' || ch == 'u' ||
        ch == 'A' || ch == 'E' || ch == 'I' || ch == 'O' || ch == 'U');
}
```

Output



```
Question 7>gcc .\main.c -Wall -o main
Question 7>.\main.exe
I is a Vowel.
Question 7>
```

Question 8: Write a C program to input any character and check whether it is alphabet, digit or special character.



```c
// 8. Write a C program to input any character and check whether it is alphabet, digit or special
// character.

#include <stdio.h>
int getType(char ch);
int main() {
    char ch = '?';
    char *options[] = {"Digit", "Alphabet", "Special Character"};
    printf("The numbers is %s\n",  options[getType(ch)]);
    return 0;
}
int getType(char ch){
    if ((ch >= 'a' && ch <= 'z') || (ch >= 'A' && ch <= 'Z'))
        return 1;
    else if (ch >= '0' && ch <= '9')
        return 0;

    return 2;
}
```

Output

```
Question 8>gcc .\main.c -Wall -o main
Question 8>.\main.exe
The numbers is Special Character
Question 8>
```

Question 9: Write a C program to check whether a character is uppercase or lowercase alphabet.

```c
// 9. Write a C program to check whether a character is uppercase or lowercase alphabet.

#include <stdio.h>
int isLowerCase(char ch);
int main() {
    char ch = 'm';
    printf("%c is %s\n", ch, isLowerCase(ch) ? "Lowercase" : "UpperCase");
    return 0;
}
int isLowerCase(char ch){
    return (ch >= 'a' && ch <= 'z');
}
```

Output

```
Question 9>gcc .\main.c -Wall -o main
Question 9>.\main.exe
m is Lowercase
Question 9>
```

Question 10: Write a C program to input month number and print number of days in that month.

```c
// 10. Write a C program to input month number and print number of days in that month.

#include <stdio.h>

int getDays(int month);
int main() {
    int month = 9;
    int days = getDays(month);
    if(days == -1){
        printf("Invalid Month\n");
    }else{
        printf("The Month %d has %d Days", month, days);
    }
    return 0;
}

int getDays(int month){
    switch (month){
    case 1:
    case 3:
    case 5:
    case 7:
    case 8:
    case 10:
    case 12:
        return 31;
    case 4:
    case 6:
    case 9:
    case 11:
        return 30;
    case 2:
        return 28;
    default:
        return -1;
    }
}
```

Output

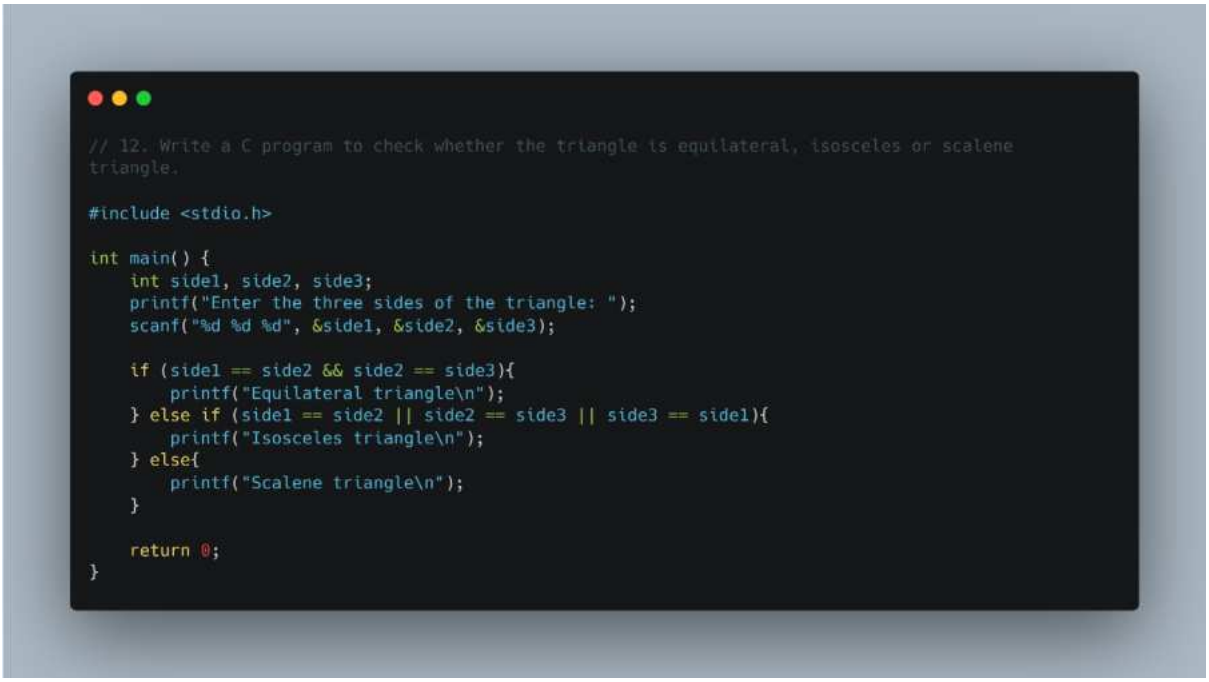
Question 11: Write a C program to input angles of a triangle and check whether triangle is valid or not.

```c
// 11. Write a C program to input angles of a triangle and check whether triangle is valid or not.

#include <stdio.h>

int isValid(int angle1, int angle2, int angle3);

int main() {
    int angle1, angle2, angle3;
    printf("Enter the three angles of the triangle: ");
    scanf("%d %d %d", &angle1, &angle2, &angle3);

    if (isValid(angle1, angle2, angle3)){
        printf("Valid triangle\n");
    }else{
        printf("Invalid triangle\n");
    }
    return 0;
}

int isValid(int angle1, int angle2, int angle3){

    return angle1 + angle2 + angle3 == 180;
}
```

Output

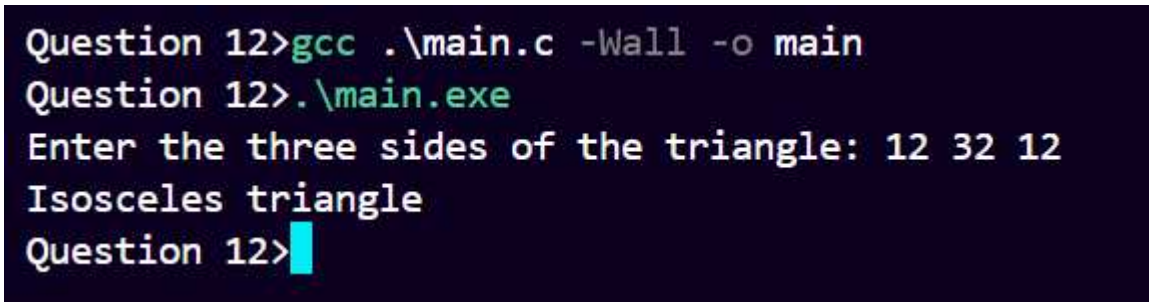
```
Question 11>gcc .\main.c -Wall -o main
Question 11>.\main.exe
Enter the three angles of the triangle: 120 30 30
Valid triangle
Question 11>
```

Question 12: Write a C program to check whether the triangle is equilateral, isosceles or scalene triangle.



```c
// 12. Write a C program to check whether the triangle is equilateral, isosceles or scalene
triangle.

#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 && side2 == side3){
        printf("Equilateral triangle\n");
    } else if (side1 == side2 || side2 == side3 || side3 == side1){
        printf("Isosceles triangle\n");
    } else{
        printf("Scalene triangle\n");
    }

    return 0;
}
```

Output



```
Question 12>gcc .\main.c -Wall -o main
Question 12>.\main.exe
Enter the three sides of the triangle: 12 32 12
Isosceles triangle
Question 12>
```

Question 13: Write a C program to find all roots of a quadratic equation.

```c
// 13. Write a C program to find all roots of a quadratic equation.

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

int main() {
    int a, b, c, D, root1, root2;
    printf("Enter the coefficients (a, b, c in ax^2 + bx + c): \n");
    scanf("%d%d%d", &a, &b, &c);

    D = b*b - 4*a*c;

    if(D >= 0){
        root1 = (-b + sqrt(D)) / (2*a);
        root2 = (-b - sqrt(D)) / (2*a);
        printf("1st Root1: %d, 2nd Root: %d\n", root1, root2);
    }else {
        printf("Roots are not real.\n");
    }

    return 0;
}
```

Output

```
Question 13>gcc .\main.c -Wall -o main
Question 13>.\main.exe
Enter the coefficients (a, b, c in ax^2 + bx + c):
10 16 4
1st Root1: 0, 2nd Root: -1
Question 13>
```

Question 14: Write a C program to input marks of five subjects Physics, Chemistry, Biology, Mathematics and Computer. Calculate percentage and grade according to following:

Percentage >= 90% : Grade A

Percentage >= 80% : Grade B

Percentage >= 70% : Grade C

Percentage >= 60% : Grade D

Percentage >= 40% : Grade E

Percentage < 40% : Grade F

```c
// 14. Write a C program to input marks of five subjects Physics, Chemistry, Biology,
// Mathematics and Computer. Calculate percentage and grade according to following:
// Percentage >= 90% : Grade A
// Percentage >= 80% : Grade B
// Percentage >= 70% : Grade C
// Percentage >= 60% : Grade D
// Percentage >= 40% : Grade E
// Percentage < 40% : Grade F

#include <stdio.h>

int main() {
    float physics, chemistry, biology, mathematics, computer;
    printf("Enter marks int the following five subjects (out of 100): physics, chemistry, biology,
mathematics, computer : ");
    scanf("%f %f %f %f %f", &physics, &chemistry, &biology, &mathematics, &computer);

    float total = physics + chemistry + biology + mathematics + computer;
    float percentage = total / 5;

    printf("The Percentage is : %.2f\n", percentage);

    if (percentage >= 90){
        printf("Grade: A\n");
    } else if (percentage >= 80){
        printf("Grade: B\n");
    } else if (percentage >= 70){
        printf("Grade: C\n");
    }else if (percentage >= 60){
        printf("Grade: D\n");
    }else if (percentage >= 40){
        printf("Grade: E\n");
    }else{
        printf("Grade: F\n");
    }
    return 0;
}
```

Output

```
Question 14>gcc .\main.c -Wall -o main
Question 14>.\main.exe
Enter marks int the following five subjects (out of 100): physics, chemistry, biology, mathematics, computer : 90 92 84 79 98
The Percentage is : 88.60
Grade: B
Question 14>
```

Question 15: Write a C program to input basic salary of an employee and calculate its Gross salary according to following:

Basic Salary <= 10000 : HRA = 20%, DA = 80%

Basic Salary <= 20000 : HRA = 25%, DA = 90%

Basic Salary > 20000 : HRA = 30%, DA = 95%

```c
// 15. Write a C program to input basic salary of an employee and calculate its Gross salary
// according to following:
// Basic Salary <= 10000 : HRA = 20%, DA = 80%
// Basic Salary <= 20000 : HRA = 25%, DA = 90%
// Basic Salary > 20000 : HRA = 30%, DA = 95%

#include <stdio.h>


float getGrossSalary(float salary);

int main() {
    float salary, grossSalary;
    printf("Enter the basic salary of an employee: ");
    scanf("%f", &salary);

    grossSalary = getGrossSalary(salary);
    printf("The Gross Salary of the employee is: %.2f\n", grossSalary);

    return 0;
}

float getGrossSalary(float salary){
    float HRA, DA;

    if (salary <= 10000) {
        HRA = salary * 0.20;
        DA = salary * 0.80;
    } else if (salary <= 20000) {
        HRA = salary * 0.25;
        DA = salary * 0.90;
    } else {
        HRA = salary * 0.30;
        DA = salary * 0.95;
    }

    return salary + HRA + DA;
}
```

Output

```
Question 15>gcc .\main.c -Wall -o main
Question 15>.\main.exe
Enter the basic salary of an employee: 12000
The Gross Salary of the employee is: 25800.00
Question 15>
```

Question 16: Write a C program to input electricity unit charges and calculate total electricity bill according to the given condition:

For first 50 units Rs. 0.50/unit

For next 100 units Rs. 0.75/unit

For next 100 units Rs. 1.20/unit

For unit above 250 Rs. 1.50/unit

An additional surcharge of 20% is added to the bill

```c
// 16. Write a C program to input electricity unit charges and calculate total electricity bill
// according to the given condition:
// For first 50 units Rs. 0.50/unit
// For next 100 units Rs. 0.75/unit
// For next 100 units Rs. 1.20/unit
// For unit above 250 Rs. 1.50/unit
// An additional surcharge of 20% is added to the bill

#include <stdio.h>

float calculateBill(int units);

int main() {
    int units;

    printf("Enter units of electricity consumed: ");
    scanf("%d", &units);

    float totalBill = calculateBill(units);
    printf("The Total Electricity Bill is : %.2f\n", totalBill);

    return 0;
}

float calculateBill(int units) {
    float totalBill;

    if (units <= 50) {
        totalBill = units * 0.50;
    } else if (units <= 150) {
        totalBill = 50 * 0.50 + (units - 50) * 0.75;
    } else if (units <= 250) {
        totalBill = 50 * 0.50 + 100 * 0.75 + (units - 150) * 1.20;
    } else {
        totalBill = 50 * 0.50 + 100 * 0.75 + 100 * 1.20 + (units - 250) * 1.50;
    }

    totalBill += totalBill * 0.20;

    return totalBill;
}
```

Output

```
Question 16>gcc .\main.c -Wall -o main
Question 16>.\main.exe
Enter units of electricity consumed: 250
The Total Electricity Bill is : 264.00
Question 16>
```