1. main.c

```
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include "header.h"

int main(){
   int question;
   printf("Enter Question Numnber: ");
   scanf("%d", &question);
   getchar();
   switch(question){
      case 1:{
         float a, b;
         printf("Enter Two Numbers : ");
         scanf("%f%f", &a, &b);
         float max = MaxBetweenTwo(a , b);
         printf("Maximum Between %f and %f is : %f", a, b, max);
         break;
      }
      case 2:{
         float a;
         printf("Enter the Number : ");
         scanf("%f",&a);
         Check(a);
         break;
      }
      case 3:{
         int a;
         printf("Enter Number : ");
         scanf("%d", &a);
```

```
    CheckDivisibleBy5And11(a);
    break;
}
case 4:{
    int a;
    printf("Enter Number : ");
    scanf("%d", &a);
    EvenOdd(a);
    break;
}
case 5:{
    int year;
    printf("Enter year : ");
    scanf("%d", &year);
    isLeapYear(year);
    break;
}
case 6:{
    char ch;
    printf("Enter a Character : ");
    scanf("%c", &ch);
    AlphabetCheck(ch);
    break;
}
case 7:{
    char ch;
    printf("Enter a Character : ");
    scanf("%c", &ch);
    VowelConsonant(ch);
    break;
}
```

```
case 8:{
   char ch;
   printf("Enter a Character : ");
   scanf("%c", &ch);
   AlphabetDigitSpecialChar(ch);
   break;
}
case 9:{
   char ch;
   printf("Enter a Character : ");
   scanf("%c", &ch);
   UppercaseLowercase(ch);
   break;
}
case 10:{
   int mn;
   printf("Enter Month Number : ");
   scanf("%d", &mn);
   int days = NumberOfDaysInMonth(mn);
   printf("Number of Days in month no %d are : %d", mn, days);
   break;
}
case 11:{
   float a , b , c;
   printf("Enter Angles of Triangle : ");
   scanf("%f%f%f", &a, &b, &c);
   AnglesOfTriangle(a, b, c);
   break;
}
case 12:{
   float a , b , c;
```

```
    printf("Enter Angles of Triangle : ");
    scanf("%f%f%f", &a, &b, &c);
    TypeOfTriangle(a, b, c);
    break;
}
case 13:{
    float a, b, c;
    printf("Enter Coefficients a, b, c of Quadratic Equation: ");
    scanf("%f%f%f", &a, &b, &c);
    RootsOfQuadratiEquation(a, b, c);
    break;
}
case 14:{
    float a, b, c, d, e;
    printf("Enter Marks of Five Subjects : ");
    scanf("%f%f%f%f%f", &a, &b, &c, &d, &e);
    char grade = Grade(a, b, c, d, e);
    printf("Your Grade is %c",grade);
    break;
}
case 15:{
    float basic_salary , gross_salary;
    printf("Enter Basic Salary : ");
    scanf("%f", &basic_salary);
    gross_salary = GrossSalary(basic_salary);
    printf("The gross salary of the employee is : %.2f\n", gross_salary);
    break;
}
case 16:{
    int units;
    float bill;
```

```
            printf("Enter Electricity Units : ");
            scanf("%d", &units);
            bill = ElectricityBill(units);
            printf("Total Electricity Bill is %f ", bill);
            break;
        }
        default:
            break;
    }
    return 0;
}
```

2. header.h

```
float MaxBetweenTwo(float a , float b);
void Check(float a);
void CheckDivisibleBy5And11(int a);
void EvenOdd(int a);
void isLeapYear(int year);
void AlphabetCheck(char ch);
void VowelConsonant(char ch);
void AlphabetDigitSpecialChar(char ch);
void UppercaseLowercase(char ch);
int NumberOfDaysInMonth(int mn);
void AnglesOfTriangle(float a, float b, float c);
void TypeOfTriangle(float a, float b, float c);
void RootsOfQuadratiEquation(float a, float b, float c);
char Grade(float a , float b , float c, float d, float e);
float GrossSalary(float basic_salary);
float ElectricityBill(int units);
```

3. logic.c

```
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include "header.h"
#include <math.h>
#include <ctype.h>

float MaxBetweenTwo(float a , float b){
   if(a > b){
      return a;
   }
   else
      return b;
}

void Check(float a){
   if(a > 0){
      printf("The Number %f is Positive", a);
   }
   else if(a < 0){
      printf("The Number %f is Negative", a);
   }
   else{
      printf("The Number %f is Zero", a);
   }
}

void CheckDivisibleBy5And11(int a){
   if((a % 5 == 0) && (a % 11 == 0)){
      printf("The Number %d is divisible by both 5 and 11", a);
```

```
    }
    else{
        printf("The Number %d is not divisible by both 5 and 11", a);
    }
}

void EvenOdd(int a){
    if(a % 2 == 0){
        printf("The Number %d is Even",a);
    }
    else{
        printf("The Number %d is Odd",a);

    }
}

void isLeapYear(int year){
    if(year % 400 == 0){
        printf("The Year %d is a Leap Year", year);
    }
    else if(year % 100 == 0){
        printf("The Year %d is not aLeap Year", year);
    }
    else if(year % 4 == 0){
        printf("The Year %d is a Leap Year", year);
    }
    else{
        printf("The Year %d is not aLeap Year", year);
    }
}
```

```
void AlphabetCheck(char ch){
   int A = (int)ch;
   if((A >= 65 && A <= 90) || (A >= 97 && A <= 122)){
      printf("The Given Character %c is Alphabet", ch);
   }
   else{
      printf("The Given Character %c is not a Alphabet", ch);
   }
}

void VowelConsonant(char ch){
   char chr = tolower(ch);
   int a = (int)chr;
   if(a == 97 || a == 101 || a == 105 || a == 111 || a == 117){
      printf("The character %c is a vowel", ch);
   }
   else{
      printf("The character %c is a consonant", ch);
   }
}

void AlphabetDigitSpecialChar(char ch){
   int A = (int)ch;
   if((A >= 65 && A <= 90) || (A >= 97 && A <= 122)){
      printf("The Given Character %c is Alphabet", ch);
   }
   else if(A >= 48 && A <= 57){
      printf("The Given Character %c is Digit", ch);
   }
   else {
      printf("The Given Character %c is a Special Character", ch);
```

```
    }
}

void UppercaseLowercase(char ch){
    int A = (int)ch;
    if(A >= 65 && A <= 90){
        printf("The Character %c is Uppercase alphabet", ch);
    }
    else if(A >= 97 && A <= 122){
        printf("The Character %c is Lowercase alphabet", ch);
    }
    else{
        printf("The Character %c is not a alphabet", ch);
    }
}

int NumberOfDaysInMonth(int mn){
    int NoOfDays = 0;
    if(mn <= 0 || mn > 12){
        printf("Invalid Month Number ");
    }
    else if(mn == 1 || mn == 3 || mn == 5 || mn == 7 || mn == 8 || mn == 10 || mn == 12){
        NoOfDays = 31;
    }
    else if(mn == 2){
        NoOfDays = 28;
    }
    else {
        NoOfDays = 30;
    }
    return NoOfDays;
```

```
}

void AnglesOfTriangle(float a, float b, float c){
   if(a + b + c == 180){
      printf("The Triangle is Valid");
   }
   else{
      printf("The Triangle is Invalid");
   }
}

void TypeOfTriangle(float a, float b, float c){
   if(a + b + c == 180){
      if(a == b && b == c && a == c){
         printf("The Triangle is Equilateral");
      }
      else if((a == b && a != c) || (b == c && a != b) || (a == c && b != c)){
         printf("The Triangle is Isosceles");
      }
      else{
         printf("The Triangle is Scalene");
      }
   }
   else{
      printf("The Triangle is Invalid");
   }
}

void RootsOfQuadratiEquation(float a, float b, float c){
   float root1, root2, realPart, imaginaryPart;
   float discriminant = b * b - 4 * a * c;
```

```
    if(a == 0){
        printf("It is not a quadratic equation");
    }
    else if(discriminant > 0){
        root1 = (-b + sqrt(discriminant)) / (2 * a);
        root2 = (-b - sqrt(discriminant)) / (2 * a);
        printf("Roots of the quadratic equation are real and different\n");
        printf("Root1 = %f\n", root1);
        printf("Root2 = %f", root2);

    }
    else if(discriminant == 0){
        root1 = root2 = -b / (2 * a);
        printf("Roots of the quadratic equation are real and same\n");
        printf("Root1 = Root2 = %f\n",root1);
    }
    else{
        realPart = -b / (2 * a);
        imaginaryPart = sqrt(-discriminant) / (2 * a);
        printf("Roots of the quadratic equation are complex and different\n");
        printf("Root1 = %.2f + %.2fi\n", realPart, imaginaryPart);
        printf("Root2 = %.2f + %.2fi\n", realPart, imaginaryPart);
    }
}

char Grade(float a , float b , float c, float d, float e){
    float percentage = (a + b + c + d + e)/5;
    printf("Your Percentage is %f\n", percentage);
    if(percentage >= 90){
        return 'A';
    }
```

```
    else if(percentage >= 80){
        return 'B';
    }
    else if(percentage >= 70){
        return 'C';
    }
    else if(percentage >= 60){
        return 'D';
    }
    else if(percentage >= 40){
        return 'E';
    }
    else{
        return 'F';
    }
}

float GrossSalary(float basic_salary){
    float gross_salary, hra, da;
    if(basic_salary <= 10000){
        hra = (0.20) * basic_salary;
        da = (0.80) * basic_salary;
    }
    else if(basic_salary <= 20000){
        hra = (0.25) * basic_salary;
        da = (0.90) * basic_salary;
    }
    else {
        hra = (0.30) * basic_salary;
        da = (0.95) * basic_salary;
    }
```

```
    gross_salary = basic_salary + hra + da;
    return gross_salary;
}

float ElectricityBill(int units){
    float bill;
    if(units <= 50){
        bill = units * 0.50;
    }
    else if(units <= 150){
        bill = 50 * 0.5 + (units - 50) * 0.75;
    }
    else if(units <= 250){
        bill = 50 * 0.5 + 100 * 0.75 +(units - 150) * 1.20;
    }
    else if(units > 250){
        bill = 50 * 0.5 + 100 * 0.75 + 100 * 1.20 + (units - 250) * 1.50;
    }
    bill = bill + bill * 20 / 100;
    return bill;
}
```

Outputs of Conditional Statements Lab Assignment:

```
E:\COEP\DSA\Assignments\ArrayLabAssignment>gcc -Wall main.c logic.c -o a

E:\COEP\DSA\Assignments\ArrayLabAssignment>a
Enter Question Numnber: 1
Enter Two Numbers : 25 36
Maximum Between 25.000000 and 36.000000 is : 36.000000
E:\COEP\DSA\Assignments\ArrayLabAssignment>a
Enter Question Numnber: 2
Enter the Number : -25
The Number -25.000000 is Negative
E:\COEP\DSA\Assignments\ArrayLabAssignment>a
Enter Question Numnber: 3
Enter Number : 65
The Number 65 is not divisible by both 5 and 11
E:\COEP\DSA\Assignments\ArrayLabAssignment>a
Enter Question Numnber: 4
Enter Number : 55
The Number 55 is Odd
```

```
E:\COEP\DSA\Assignments\ArrayLabAssignment>gcc -Wall main.c logic.c -o a

E:\COEP\DSA\Assignments\ArrayLabAssignment>a
Enter Question Numnber: 5
Enter year : 2024
The Year 2024 is a Leap Year
E:\COEP\DSA\Assignments\ArrayLabAssignment>a
Enter Question Numnber: 6
Enter a Character : T
The Given Character T is Alphabet
E:\COEP\DSA\Assignments\ArrayLabAssignment>a
Enter Question Numnber: 6
Enter a Character : #
The Given Character # is not a Alphabet
E:\COEP\DSA\Assignments\ArrayLabAssignment>a
Enter Question Numnber: 7
Enter a Character : A
The character A is a vowel
E:\COEP\DSA\Assignments\ArrayLabAssignment>a
Enter Question Numnber: 7
Enter a Character : B
The character B is a consonant
```

```
E:\COEP\DSA\Assignments\ArrayLabAssignment>a
Enter Question Numnber: 8
Enter a Character : W
The Given Character W is Alphabet
E:\COEP\DSA\Assignments\ArrayLabAssignment>a
Enter Question Numnber: 8
Enter a Character : 5
The Given Character 5 is Digit
E:\COEP\DSA\Assignments\ArrayLabAssignment>a
Enter Question Numnber: 8
Enter a Character : $
The Given Character $ is a Special Character
E:\COEP\DSA\Assignments\ArrayLabAssignment>a
Enter Question Numnber: 9
Enter a Character : s
The Character s is Lowercase alphabet
E:\COEP\DSA\Assignments\ArrayLabAssignment>a
Enter Question Numnber: 10
Enter Month Number : 5
Number of Days in month no 5 are : 31
```

```
Enter Question Numnber: 11
Enter Angles of Triangle : 30 60 90
The Triangle is Valid
E:\COEP\DSA\Assignments\ArrayLabAssignment>a
Enter Question Numnber: 11
Enter Angles of Triangle : 50 60 80
The Triangle is Invalid
E:\COEP\DSA\Assignments\ArrayLabAssignment>a
Enter Question Numnber: 12
Enter Angles of Triangle : 60 60 60
The Triangle is Equilateral
E:\COEP\DSA\Assignments\ArrayLabAssignment>a
Enter Question Numnber: 12
Enter Angles of Triangle : 40 40 100
The Triangle is Isosceles
E:\COEP\DSA\Assignments\ArrayLabAssignment>a
Enter Question Numnber: 13
Enter Coefficients a, b, c of Quadratic Equation: 1 2 4
Roots of the quadratic equation are complex and different
Root1 = -1.00 + 1.73i
Root2 = -1.00 + 1.73i

E:\COEP\DSA\Assignments\ArrayLabAssignment>a
Enter Question Numnber: 13
Enter Coefficients a, b, c of Quadratic Equation: 1 4 4
Roots of the quadratic equation are real and same
Root1 = Root2 = -2.000000
```

```
E:\COEP\DSA\Assignments\ArrayLabAssignment>a
Enter Question Numnber: 14
Enter Marks of Five Subjects : 75 80 95 85 90
Your Percentage is 85.000000
Your Grade is B
E:\COEP\DSA\Assignments\ArrayLabAssignment>a
Enter Question Numnber: 15
Enter Basic Salary : 50000
The gross salary of the employee is : 112500.00

E:\COEP\DSA\Assignments\ArrayLabAssignment>a
Enter Question Numnber: 16
Enter Electricity Units : 257
Total Electricity Bill is 276.600006
E:\COEP\DSA\Assignments\ArrayLabAssignment>
```