Lab 1

(Branching)

Q1\ Positive or negative or zero

```c
#include <stdio.h>
void main(void)
{
    int num;
    printf("Enter a number: ");
    scanf("%d",&num);
    if(num > 0)
        printf("Number is Positive \n");
    else if (num < 0)
        printf("Number is Negative \n");
    else
        printf("Number is Zero \n");
}

```

Run

Positive:

```
Enter a number: 50
Number is Positive
```

Negative:

```
Enter a number: -50
Number is Negative
```

Zero:

```
Enter a number: 0
Number is Zero
```

Q2\Print grade

```c
#include <stdio.h>
void main(void)
{
    int grade;
    printf("Enter Your Grade : ");
    scanf("%d",&grade);
    if(grade < 50)
        printf("You Failed");
    else if (grade >= 50 && grade <65)
        printf("You Passed");
    else if (grade >= 65 && grade <80)
        printf("Good");
    else if (grade >= 80 && grade < 90)
        printf("Very Good");
    else
        printf("Excellent");
}
```

Run

```
Enter Your Grade : 40
You Failed
```

```
Enter Your Grade : 50
You Passed
```

```
Enter Your Grade : 65
Good
```

```
Enter Your Grade : 80
Very Good
```

```
Enter Your Grade : 90
Excellent
```

Q4\Get integer and convert to amount text (0:999)

```c
#include <stdio.h>
void convertDigit(int num);
void convertTens(int num);
void convertAmountToText(int amount);
void main(void)
{
    int amount;
    printf("Enter an integer number (0-999): ");
    scanf("%d", &amount);
    printf("Amount in text: ");
    convertAmountToText(amount);
    printf("\n");
}
```

```c
void convertDigit(int num)
{
    switch (num)
    {
    case 1:
        printf("One ");break;
    case 2:
        printf("Two ");break;
    case 3:
        printf("Three ");break;
    case 4:
        printf("Four ");break;
    case 5:
        printf("Five ");break;
    case 6:
        printf("Six ");break;
    case 7:
        printf("Seven ");break;
    case 8:
        printf("Eight ");break;
    case 9:
        printf("Nine ");break;
    }
}
```

```
39  void convertTens(int num)
40  {
41      if (num >= 20)
42      {
43          switch (num / 10)
44          {
45          case 2:
46              printf("Twenty ");break;
47          case 3:
48              printf("Thirty ");break;
49          case 4:
50              printf("Forty ");break;
51          case 5:
52              printf("Fifty ");break;
53          case 6:
54              printf("Sixty ");break;
55          case 7:
56              printf("Seventy ");break;
57          case 8:
58              printf("Eighty ");break;
59          case 9:
60              printf("Ninety ");break;
61          }
62          convertDigit(num % 10);
63      }
```

```
    else if (num >= 10)
    {
        switch (num)
        {
        case 10:
            printf("Ten ");break;
        case 11:
            printf("Eleven ");break;
        case 12:
            printf("Twelve ");break;
        case 13:
            printf("Thirteen ");break;
        case 14:
            printf("Fourteen ");break;
        case 15:
            printf("Fifteen ");break;
        case 16:
            printf("Sixteen ");break;
        case 17:
            printf("Seventeen ");break;
        case 18:
            printf("Eighteen ");break;
        case 19:
            printf("Nineteen ");break;
        }
    }
    else
    {
        convertDigit(num);
    }
}
```

```
void convertAmountToText(int amount)
{
    if (amount == 0)
    {
        printf("Zero");
        return;
    }
    if (amount >= 100)
    {
        convertDigit(amount / 100);
        printf("Hundred ");
        amount %= 100;
    }
    convertTens(amount);
}
```

Run

```
Enter an integer number (0-999): 999
Amount in text: Nine Hundred Ninety Nine
```

Q6\ Quadratic Equation

```c
#include <stdio.h>
#include <math.h>
void main(void)
{
    float a,b,c,Discriminant,root1,root2,real,imaginary;
    printf("Enter the coefficients a,b,c (aX^2 + bX + C = 0): ");
    scanf("%f%f%f",&a,&b,&c);
    Discriminant= (b*b) - (4*a*c);
    if(Discriminant>0)
    {
        //roots are real and distinct (unequal)
        root1 = (-b + sqrt(Discriminant))/(2*a);
        root2 = (-b - sqrt(Discriminant))/(2*a);
        printf("roots are real and distinct (unequal): \n");
        printf("Root 1 = %.2f \n",root1);
        printf("Root 2 = %.2f \n",root2);
    }
    else if(Discriminant=0)
    {
        //roots are real and equal
        root1 = root2 = -b / (2*a);
        printf("roots are real and equal: \n");
        printf("Root = %.2f \n",root1);
    }
    else
    {
        //roots are imaginary and unequal
        real = -b / (2*a);
        imaginary = sqrt(-Discriminant) / (2*a);
        printf("roots are imaginary and unequal: \n");
        printf("Root 1: %.2lf + %.2lfi\n", real, imaginary);
        printf("Root 2: %.2lf - %.2lfi\n", real, imaginary);
    }
}

```

Run:

```
Enter the coefficients a,b,c (aX^2 + bX + C = 0): 1
5
6
roots are real and distinct (unequal):
Root 1 = -2.00
Root 2 = -3.00
```

Q7\Calculate income tax

```c
#include <stdio.h>
void main(void)
{
    float income;
    float tax;
    printf("Enter your income: ");;
    scanf("%f",&income);
    if (income <= 7000)
        printf("Exempted");
    else if (income > 7000 && income <= 20000)
    {
        tax=income*0.1;
        printf("Your Taxes [10%%] = %.2f",tax );
    }
    else if (income > 20000 && income <= 45000)
    {
        tax=income*0.15;
        printf("Your Taxes [15%%] = %.2f",tax );
    }
    else if (income > 45000 && income <= 200000)
    {
        tax=income*0.2;
        printf("Your Taxes [20%%] = %.2f",tax );
    }
    else
    {
        tax=income*0.4;
        printf("Your Taxes [40%%] = %.2f",tax );
    }
}

```

Run:

```
Enter your income: 20000
Your Taxes [10%] = 2000.00
```

```
Enter your income: 200000
Your Taxes [20%] = 40000.00
```