National Institute of Technology Hamirpur
Computer Programming Lab (CS-102)

Lab session 5
(C Programming)

Q1. Write a C program to enter a character and determine whether it is a vowel or not.

```c
#include<stdio.h>
#include<conio.h>
int main()
{
    char c; int LC, UC;
    printf("enter character ");
    scanf("%c", &c);
    /*vowels*/
    LC= (c=='a'||c=='e'||c=='i'||c=='o'||c=='u');
    UC= (c=='A'||c=='E'||c=='I'||c=='O'||c=='U');
    if (LC||UC)
    {
        printf("%C is a vowel", c);
    }
    else
    {
        printf("%c is consonent", c);
    }

}
```

```
enter character a
a is a vowel
PS G:\code>
PS G:\code>  & 'c:\Users\hp
.pt4' '--stdout=Microsoft-M
m Files\mingw-w64\mingw32\b
enter character A
A is a vowel
PS G:\code>
```

Q2. Write a C program using the switch...case construct for Q1.

```c
#include<stdio.h>
int main()
{
    char c;
    printf("enter character ");
    scanf("%c", &c);
   switch (c)
   {
   case 'a':
       printf("It's a vowel");
       break;
   case 'A':
       printf("It's a vowel");
       break;
   case 'e':
       printf("It's a vowel");
       break;
   case 'E':
       printf("It's a vowel");
       break;
   case 'i':
       printf("It's a vowel");
```

```
        break;
    case 'I':
        printf("It's a vowel");
        break;
    case 'o':
        printf("It's a vowel");
        break;
    case 'O':
        printf("It's a vowel");
        break;
    case 'u':
        printf("It's a vowel");
        break;
    case 'U':
        printf("It's a vowel");
        break;

    default:
     printf("it's a consonent");
        break;

     }
     return 0;

}
```

```
enter character a
a is a vowel
PS G:\code>  & 'c:\Users\hp\.vscode\extensions\ms-vscode.c
.s0u' '--stdout=Microsoft-MIEngine-Out-sglmuula.ond' '--st
m Files\mingw-w64\mingw32\bin\gdb.exe' '--interpreter=mi'
enter character d
d is consonent
PS G:\code>
```

Q3. A company decides to give bonus to all its employees on New Year. It is decided that 5% bonus will be given to all male employees and 10% bonus will be given to female employees.
Further, if the salary of an employee is less than Rs. 10,000, then the employee gets an extra 2% bonus on salary. Write a C program to

enter the salary and gender of an employee and calculate the bonus that has to be given to an employee.

```c
#include<stdio.h>
int main()
{
   int i,j;
   char gender;
   float salary,bonus;
   printf("Enter M if male and F for female ");
   scanf("%c", &gender);
   printf("Enter your salary ");
   scanf("%f", &salary);
   if (gender=='M'|| gender=='m')
   {
       if (salary>10000)

       bonus=(float)(salary*0.05);
       else

       bonus=(float)(salary*0.07);

   }
   if (gender=='F'|| gender=='f')
   {
       if (salary>10000)

       bonus=(float)(salary*0.1);
       else

       bonus=(float)(salary*0.12);

   }
   bonus+salary;
   printf("Your bonus is %.2f\nTherefore your salary for this month is %.2f",
bonus,bonus+salary);

}
```

```
Enter M if male and F for female f
Enter your salary 30500
Your bonus is 3050.00
Therefore your salary for this month is 33550.00
PS G:\code>
```

Q4. Write a C program using the switch...case construct for Q3.

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

```
{
   char gender;
   int salary,bonus;
   printf("Enter M if male and F for female ");
   scanf("%c", &gender);
   printf("Enter your salary ");
   scanf("%f", &salary);
switch (gender)
{
case 'M':
    switch (salary)
    {
    case '>10000':
        bonus=(int)(salary*0.05);
        break;

    default:
        bonus=(int)(salary*0.07);
        break;
    }
    break;
case 'm':
    switch (salary)
    {
    case '>10000':
        bonus=(int)(salary*0.05);
        break;

    default:
        bonus=(int)(salary*0.07);
        break;
    }
    break;
case 'F':
    switch (salary)
    {
    case '>10000':
        bonus=(int)(salary*0.1);
        break;

    default:
        bonus=(int)(salary*0.12);
        break;
    }
    break;
default:
    break;
}
```

```
   bonus+salary;
   printf("Your bonus is %.2f\nTherefore your salary for this month is %.2f",
bonus,bonus+salary);

}
```

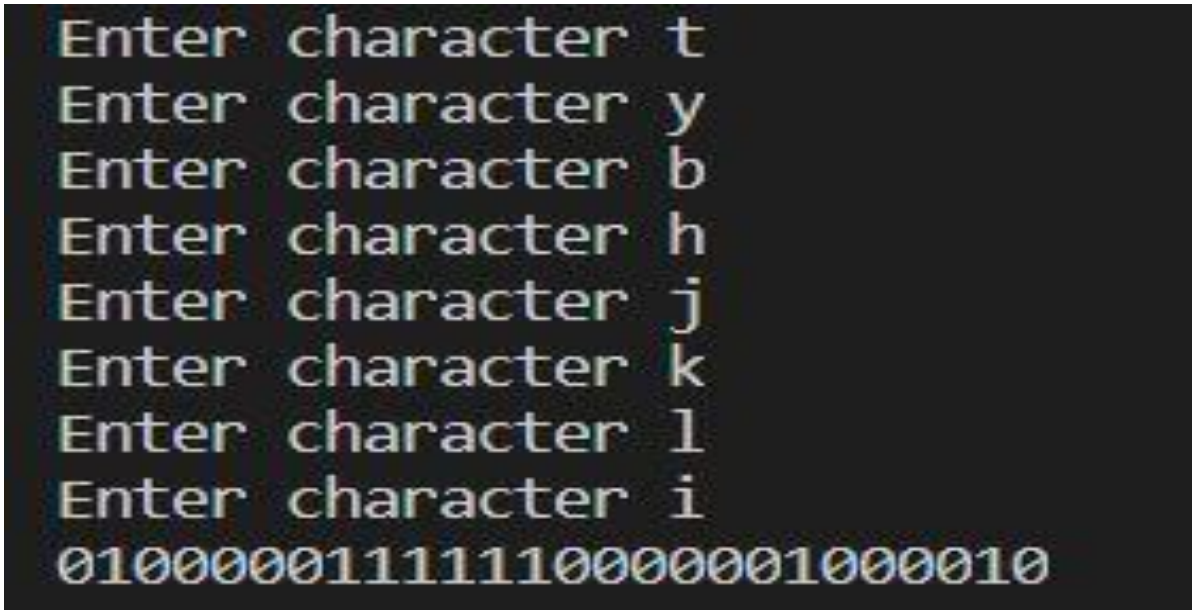
```
Enter M if male and F for female m
Enter your salary 5000
Your bonus is 350.00
Therefore your salary for this month is 5350.00
PS G:\code>
```

Q5. Write a C program using while loop to enter a character and continue entering until a consonant is encountered. Further, display the number of times each of the characters entered.

```c
#include<stdio.h>
#include<ctype.h>
int main()
{
    int count[26]={0};
    while (1)
    {
        char check;
        printf("Enter character ");
        scanf("\n%c", &check);
        check=toupper(check);
        count[check-65]++;
        if (check=='A'||check=='E'||check=='I'||check=='O'||check=='U')
        {
            break;
        }
    }

    for(int i=0; i<26; i++){
        printf("%d", count[i]);
    }


    return 0;
}
```



Q6. Using a for loop, write a C program to read numbers until -1 is encountered. Display the count of negative, positive, and zeros entered by the user.

```c
#include<stdio.h>

int main(){
    int zero=0, negative=0, positive=0;

    for(; ; ){
        int n;
        scanf("%d", &n);

        if(n==0){
            zero++;
        } else if(n>0){
            positive++;
        } else{
            negative++;
        }
    }

    printf("Zero's: %d, Negative numbers: %d, Positive numbers: %d", zero, neg
ative, positive);
}
```

```
Enter value 2
Enter value 1
Enter value -9
Enter value 7
Enter value 5
Enter value 7
Enter value 9
Enter value -1
Zero's: 0, Negative numbers: 2, Positive numbers: 6
PS G:\code>
```

Q7. Using a do while loop, write a program in C to display all the leap years from 1800 to 2000.

```c
#include<stdio.h>

int main(){
    int a=1800;

    do{
        if(a%4==0){
            printf("%d\n", a); a+=4;
        }
    } while(a<2001);
}
```

```
1800 1804 1808 1812 1816 1820 1824 1828 1832 1836
1932 1936 1940 1944 1948 1952 1956 1960 1964 1968
1972 1976 1980 1984 1988 1992 1996 2000
PS G:\code>
```

Q8. Write a program using a loop to display the following pattern.

A
A B
A B C
A B C D
A B C D E
A B C D
A B C
A B

A

```c
#include<stdio.h>

int main(){
    char c;
    for(char i='A'; i<='E'; i++){
        c='A';
        for(; c<=i; c++){
            printf("%c", c);
        }
        printf("\n");
    }

    for(int i='D'; i>='A'; i--){
        c='A';
        for(; c<=i; c++){
            printf("%c", c);
        }
        printf("\n");
    }

    return 0;
}
```