Subject

Programming and Data Structures using C

Assignment 4

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Q1. Check Whether a Character is a Vowel or Consonant (Using if)

```
#include <stdio.h>

int main()
{
    char ip;
    int flag=0;
    printf("Enter the char - ");
    scanf("%c",&ip);
    if(ip=='a' || ip=='A'){ flag=1;
    printf("You entered vowel");}
    if(ip=='e' || ip=='E'){ flag=1;
    printf("You entered vowel");}
    if(ip=='i' || ip=='I'){ flag=1;
    printf("You entered vowel");}
    if(ip=='o' || ip=='O'){ flag=1;
    printf("You entered vowel");}
    if(ip=='u' || ip=='U'){ flag=1;
    printf("You entered vowel");}


    if(flag==0)
    printf("You entered consonant ");

    return 0;
}
```

Output

```
Enter the char - A
You entered vowel
```

Q2. Find Roots of a Quadratic Equation (Using else if ladder)

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

int main()
{
    double r,a,q,b,c;
    printf("Enter the Quadrativ value of variable a,b,c Resp. : \n");
    scanf("%lf %lf %lf",&a,&b,&c);

    r= b*b - (4 *a*c);

    if (r==0){
        q= -b /(2*a);
        printf("The root of given QE.is : %.3lf ",q);
    }
    else if (r<0){
    double real, imag;
        real=-b /(2*a);
        imag=sqrt(-r) / (2*a);

         printf(" the root of given QE. is \n value 1 = %.3lf + %.3lfi   \n value 2 = %.3lf
- %.3lfi ",real,imag,real,imag);

    }
    else if (r>0){
        q= -b + sqrt(q)/ (2*a);
        printf(" the root of given QE. is \n value 1 = %.3lf \n",q);
        q= -b - sqrt(q)/ (2*a);
        printf("value 2 = %.3lf",q);

    }
    else printf("\nplease entered in valid input \n\n \t '   ' \n\t ----");
    return 0;
}
```

Output

```
Enter the Quadrativ value of variable a,b,c Resp. :
2
3
4
 the root of given QE. is
 value 1 = -0.750 + 1.199i
 value 2 = -0.750 - 1.199i
```

Q3. Check Leap Year (Using if..else)

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

int main()
{
    int y;
    printf("Enter the year to check leap year :");
    scanf("%d",&y);
    if(y%4==0)
    printf("leap year");
    else printf("no leap year");
    return 0;
}
```

Output

```
Enter the year to check leap year :2021
no leap year
```

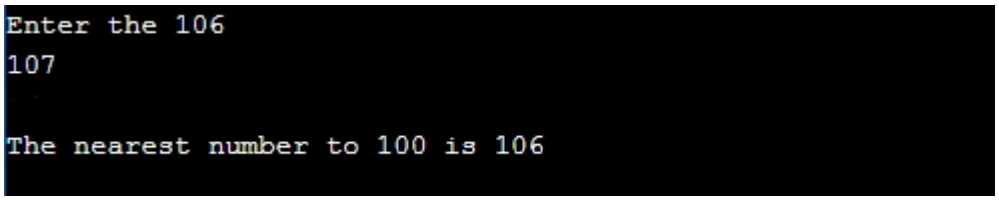
Q4. check which number nearest to the value 100 among two given integers. Return 0 if the two numbers are equal. (Using nested if…else)

```
#include <stdio.h>


int main()
{
 int n,b,m,a;
 printf("Enter the ");
 scanf("%d %d ",&n,&m);
 a=abs(100-n);
 b=abs(100-m);
if(a==b)
 printf("0");
   else if(a<b)
 printf("The nearest number to 100 is %d",n);
 else printf("The nearest number to 100 is %d",m);

 return 0;
}
```

Output



Q5. check three given integers (small, medium and large) and return true if the difference between small and medium and the difference between medium and large is same. (Using nested if…else)

```
#include <stdio.h>

int main()
{
    int s,m,l,a,b,c;
    printf("Enter the ");
    scanf("%d %d %d ",&a,&b,&c);
    if(a<b && a<c)
    {
        s=a;
        if(b>c){
            l=b;
            m=c;}
        else { l=c;
            m=b; }   }
    else if(b<a && b<c)
    { s=b;
        if(a>c) { l=a;
            m=c; }
        else { l=c;
            m=a; } }
    else if(a<b)
    {s=c;
      m=a;
        l=b; }
    else{s=c;
        m=b;
        l=a; }

    printf("s= %d m= %d l= %d",s,m,l);

    a=m-s;
    b=l-m;
    if(a==b)
    printf("True");
    else printf("False");
  return 0;
}
```

Output

Q6. Calculate and print the Electricity bill of a given customer. The customer id., name and unit consumed by the user should be taken from the keyboard and display the total amount to pay to the customer. The charge are as follow :

Unit	Charge/unit
upto 199	@1.20
200 and above but less than 400	@1.50
400 and above but less than 600	@1.80
600 and above	@2.00

If bill exceeds Rs. 400 then a surcharge of 15% will be charged and the minimum bill should be of Rs. 100/- (Using else if ladder)

```
#include <stdio.h>
int main()
{
    double cId,cUnits,r,cAmo;
    char cName[30];
    printf("Enter the customer name :");
    scanf("%s",&cName);
    printf("Enter the customer ID and Units consumed");
    scanf("%lf %lf",&cId,&cUnits);
    if(cUnits >= 600)r=2.0;
    else if (cUnits >=400 )r=   1.8;
    else if (cUnits >=200 ) r=   1.5;
    else r=   1.2;
    printf("\n");
    cAmo=cUnits*r;
    if (cAmo <100)
    printf("\nYour amount is less then 100");
    else if (cAmo>400){
        double f,fa;
        printf("\nYour Bill exceds to 400 INR \n the surcharge will apply @15%");
        f=cAmo*0.15;
        fa=cAmo-f;
        printf("\nThe Total Amount pay : %.3lf",fa); }
    else
    printf("The Amount pay : %.3lf",cAmo);
    return(0);}
```

Output

```
Enter the customer name :Raj
Enter the customer ID and Units consumed21
376


Your Bill exceds to 400 INR
 the surcharge will apply @15
The Total Amount pay : 479.400
```

Q7. The marks obtained by a student in 3 different subjects are input by the user. Your program should calculate the average of subjects. The student gets a grade as per the following rules: (Using else if ladder)

Average	Grade
90-100	A
80-89	B
70-79	C
60-69	D
0-59	F

```
#include <stdio.h>

int main()
{
    double sa,sb,sc,avg;
    char g;
    printf("Enter the Marks of sutdent S1,S2,S3 Resp. : \n");
    scanf("%lf %lf %lf",&sa,&sb,&sc);

    avg= (sa+sb+sc)/3;

    if(avg >= 90)
    g='A';
    else if (avg >=80 )
    g='B';
    else if (avg >=70 )
    g='C';
    else if (avg >=60 )
    g='D';
    else
    g='F';

   printf("\nThe Grade of the Student is %c",g);
    return(0);
}
```

Output

```
Enter the Marks of sutdent S1,S2,S3 Resp. :
65
75
85

The Grade of the Student is C
```

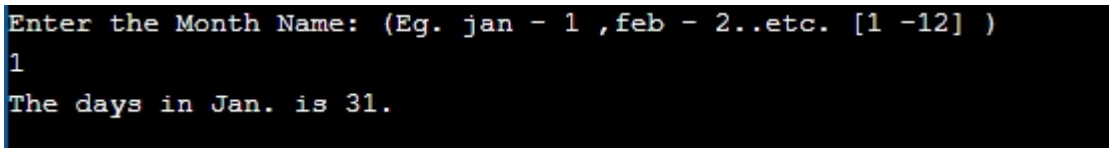
Q8. print total number of days in a month using switch case.

```
#include <stdio.h>

int main()
{
    int m;
    printf("Enter the Month Name: (Eg. jan - 1 ,feb - 2..etc. [1 -12] ) \n");
    scanf("%d", &m);
    switch(m)
    {
        case 1: printf("The days in Jan. is 31.");break;
        case 2: printf("The days in Feb. is 28 or 29.");break;
        case 3: printf("The days in Mar. is 31."); break;
        case 4: printf("The days in Apr. is 30.");break;
        case 5: printf("The days in May. is 31."); break;
        case 6: printf("The days in Jun. is 30.");break;
        case 7: printf("The days in Jul. is 31."); break;
        case 8: printf("The days in Aug. is 31.") ;break;
        case 9: printf("The days in Sep. is 30."); break;
        case 10: printf("The days in Oct. is 31.");break;
        case 11: printf("The days in Nov. is 30.") ; break;
        case 12: printf("The days in Dec. is 31."); break;
        default: printf("Enter valid input");

    }
    return(0);
}
```

Output



Q9. Create Simple Calculator using switch case.

```
#include <stdio.h>

void main()
{
int n1,n2,o;

printf("Enter number 1 and number 2 (Resp.):\n");
scanf("%d %d ",&n1,&n2);
                                                    printf("\nEnter the your
option:\n1-Addition.\n2-Substraction.\n3-Multiplication.\n4-Division.\n5-Exit.\n");
scanf("%d",&o);
switch(o)
{
case 1:printf("\nAddition of   %d and %d is: %d",n1,n2,n1+n2);
break;
case 2:printf("\nSubstraction of %d   and %d is:   %d",n1,n2,n1-n2);
break;
case 3:printf("\nMultiplication of %d   and %d is:   %d",n1,n2,n1*n2);
break;
case 4:
if(n2==0)
   printf("OOps Devide by zero\n");
else
   printf("\n Division of %d   and %d is:   %d",n1,n2,n1/n2);
break;
case 5: return 0;
break;
default:printf("\n invalid input\n");
break;
}}
```

Output

```
Enter number 1 and number 2 (Resp.):
5
7
1

Enter the your option:
1-Addition.
2-Substraction.
3-Multiplication.
4-Division.
5-Exit.

Addition of  5 and 7 is: 12
```

Q10. Prompts the user to enter grade. Your program should display the corresponding meaning of grade as per the following table (Using Switch Case)

Grade	Meaning
A	Excellent
B	Good
C	Average
D	Deficient
F	Failing

```
#include <stdio.h>

void main()
{
char g;

printf("Enter the grade:\n");
scanf("%c ",&g);

switch(g)
{
case 'A':printf("\nExcellent");break;
case 'B':printf("\nGood");break;
case 'C':printf("\nAverage");break;
case 'D':printf("\nDeficien");break;
case 'F':printf("\nFailing");break;
default:printf("\n invalid input\n");
break;
}

}
```

Output