Indian Institute of Information Technology (IIIT) Pune

Computer Programming Lab.

1st Semester

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Assignment-4

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SECTION (GROUP) – A (Group 1)

Q1. If the ages of Deepak, Ajit and Vivek are input through the keyboard, write a program to determine the youngest of the three.

Ans:


```
#include<stdio.h>
int main (){
   int d , a , v ;
scanf ("%d%d%d", &d,&a,&v);
// return d>=a && d>=v ? d : a>=d && a>=v ? a : v>=a && v>=d ? v ;
if (d<=a && d<=v){
   printf ("Deepak is youngest");
}
else if (a<=d && a<= v){
   printf ("Ajit is youngest");}
else {
   printf ("Vivek is youngest");
}

}
```

Q2. Write a program to check whether a triangle is valid or not, when the three angles of the triangle are entered through the keyboard. A triangle is valid if the sum of all the three angles is equal to 180 degrees.

```
19  #include <stdio.h>
20  int main(){
21   int a , b ,c,sum ;
22   printf ("enter angles of triangle : ");
23   scanf  ("%d%d%d", &a ,&b ,&c);
24    sum = a+b+c;
25  (sum==180 ? (printf("Yes Valid")) : (printf("Not Valid")));
26  }
```

```
PROBLEMS   OUTPUT   DEBUG CONSOLE   TERMINAL   PORTS

PS D:\c++\Asssignment> cd "d:\c++\Asssignment\" ; if ($?) { gcc assing4.c -o assing4 } ; if ($?) { .\assing4 }
enter angles of triangle : 60 80 40
Yes Valid
PS D:\c++\Asssignment> cd "d:\c++\Asssignment\" ; if ($?) { gcc assing4.c -o assing4 } ; if ($?) { .\assing4 }
enter angles of triangle : 60 70 30
Not Valid
PS D:\c++\Asssignment>
```

```
#include <stdio.h>
int main(){
 int a , b ,c,sum ;
 printf ("enter angles of triangle : ");
 scanf  ("%d%d%d", &a ,&b ,&c);
  sum = a+b+c;
(sum==180 ? (printf("Yes Valid")) : (printf("Not Valid")));
}
```

Q3. Any integer is input through the keyboard. Write a program to find out whether it is an odd number or even number.

Ans :

```
29  #include <stdio.h>
30  int main (){
31  int n ;
32  scanf ("%d", &n);
33  if (n%2 == 0){
34      printf ("Even");
35  }
36  else {
37      printf ("Odd");
38  }
39  }
40
```

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS

PS D:\c++\Asssignment> cd "d:\c++\Asssignment\" ; if ($?) { gcc assing4.c -o assing4 } ; if ($?) { .\assing4 }
5
Odd
PS D:\c++\Asssignment> cd "d:\c++\Asssignment\" ; if ($?) { gcc assing4.c -o assing4 } ; if ($?) { .\assing4 }
10
Even
PS D:\c++\Asssignment>
```

```c
#include <stdio.h>
int main (){
int n ;
scanf ("%d", &n);
if (n%2 == 0){
    printf ("Even");
}
else {
    printf ("Odd");
}
}
```

Q4. If cost price and selling price of an item is input through the keyboard, write a program to determine whether the seller has made profit or incurred loss. Also determine how much profit he made or loss he incurred.

Ans :

```
41  #include <stdio.h>
42  int main (){
43      int cp , sp ;
44      scanf (" %d%d", &cp ,&sp);
45      if (sp > cp){
46              int ans = sp -cp ;
47  printf("Profit by %d", ans);
48      }
49      else {
50          int ans = cp - sp ;
51          printf("Loss by %d", ans);
52      }
53  }
```

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS

PS D:\c++\Asssignment> cd "d:\c++\Asssignment\" ; if ($?) { gcc assing4.c -o assing4 } ; if ($?) { .\assing4 }
8 10
Profit by 2
PS D:\c++\Asssignment> cd "d:\c++\Asssignment\" ; if ($?) { gcc assing4.c -o assing4 } ; if ($?) { .\assing4 }
9 5
Loss by 4
PS D:\c++\Asssignment>
```

```c
#include <stdio.h>
int main (){
    int cp , sp ;
    scanf (" %d%d", &cp ,&sp);
    if (sp > cp){
          int ans = sp -cp ;
printf("Profit by %d", ans);
    }
    else {
        int ans = cp - sp ;
        printf("Loss by %d", ans);
    }
}
```

Q5. Any year is input through the keyboard. Write a program to determine whether the year is a leap year or not. (Hint: Use the % (modulus) operator)

ans :

```c
#include <stdio.h>
int main (){
    int y;
scanf ("%d",&y);
if (y%4 == 0){
    printf("leap year");
}
else {
    printf("not leap year");
}
}
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
PS D:\c++\Asssignment> cd "d:\c++\Asssignment\" ; if ($?) { gcc assing4.c -o assing4 }
2024
leap year
PS D:\c++\Asssignment> cd "d:\c++\Asssignment\" ; if ($?) { gcc assing4.c -o assing4 }
2019
not leap year
```


```c
#include <stdio.h>
int main (){
    int y;
scanf ("%d",&y);
if (y%4 == 0){
    printf("leap year");
}
else {
    printf("not leap year");
}
}
```

Q6. A five-digit number is entered through the keyboard. Write a program to obtain the reversed number and to determine whether the original and reversed numbers are equal or not.

Ans:

```c
#include <stdio.h>
int main (){
int n; //123
scanf ("%d", &n);
int ans = 0 ; int a = n ;
while(n!= 0){
    ans = ans*10 + n%10;
    n = n/10;
}
printf ("reverse is : %d \n ", ans);
if (ans==a){
    printf("same");
}
else {
    printf("not same");
}
}
```

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS

PS D:\c++\Asssignment> cd "d:\c++\Asssignment\" ; if ($?) { gcc assing4.c -o assing
134431
reverse is : 134431
 same
PS D:\c++\Asssignment>
```


```c
#include <stdio.h>
int main (){
int n; //123
scanf ("%d", &n);
int ans = 0 ; int a = n ;
while(n!= 0){
    ans = ans*10 + n%10;
    n = n/10;
}
printf ("reverse is : %d \n ", ans);
if (ans==a){
    printf("same");
}
else {
    printf("not same");
} }
```

Q7. Given the length and breadth of a rectangle, write a program to find whether the area of the rectangle is greater than its perimeter. For example, the area of the rectangle with length = 5 and breadth = 4 is greater than its perimeter.

Ans :

```c
#include <stdio.h>
int main(){
   int l , b ;
   scanf ("%d%d",&l , &b);
   int ar = l*b;
   int pm = 2*(l+b);
 (ar >= pm) ? (printf ("area is greater")) : (printf ("perimeter is greater")) ;
}
```

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS

PS D:\c++\Asssignment> cd "d:\c++\Asssignment\" ; if ($?) { gcc assing4.c -o assing4 } ; if ($?) { .\assing4 }
5 4
area is greater
PS D:\c++\Asssignment>
```

Q8. Given three points (x1, y1), (x2, y2) and (x3, y3), write a program to check if all the three points fall on one straight line.

Ans :

```c
#include <stdio.h>
int main (){
    int x1,x2,x3,y1,y2,y3 ;
    scanf ("%d%d%d%d%d%d", &x1,&x2,&x3,&y1,&y2,&y3);
    int m = (y2-y1)/(x2-x1);
    int n = (y3-y2)/(x3-x2);
    if (m==n){
        printf ("the three points fall on one straight line.");
    }
    else {
        printf ("not on straingt line");
    }
}
```

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS

PS D:\c++\Asssignment> cd "d:\c++\Asssignment\" ; if ($?) { gcc assing4.c -o assing4 } ; if ($?) { .\assing4 }
1 3 5 2 4 6
the three points fall on one straight line.
PS D:\c++\Asssignment>
```

```c
#include <stdio.h>
int main (){
    int x1,x2,x3,y1,y2,y3 ;
    scanf ("%d%d%d%d%d%d", &x1,&x2,&x3,&y1,&y2,&y3);
    int m = (y2-y1)/(x2-x1);
    int n = (y3-y2)/(x3-x2);
    if (m==n){
        printf ("the three points fall on one straight line.");
    }
    else {
        printf ("not on straingt line");
    }
}
```

Q9. A certain grade of steel is graded according to the following conditions:

(i) Hardness must be greater than 50 (ii) Carbon content must be less than 0.7 (iii) Tensile strength must be greater than 5600
The grades are as follows:
Grade is 10 if all three conditions are met
Grade is 9 if conditions (i) and (ii) are met
Grade is 8 if conditions (ii) and (iii) are met
Grade is 7 if conditions (i) and (iii) are met
Grade is 6 if only one condition is met
Grade is 5 if none of the conditions are met
Write a program, which will require the user to give values of hardness, carbon content and tensile strength of the steel under consideration and output the grade of the steel.

```
109  #include <stdio.h>
110  int main (){
111      int h , c , t ;
112      scanf("%d%f%d", &h , &c , &t);
113     if (h>=50 && c <= 0.7 && t >= 5600 ){
114      printf ("grade 10");
115     }
116     else if (h>=50 && c <= 0.7){
117       printf ("grade 9");
118     }
119       else if (t >= 5600 && c <= 0.7){
120       printf ("grade 8");
121     }
122      else if (h>=50 && t >= 5600){
123       printf ("grade 7");
124     }
125       else if (h>=50 || c <= 0.7 || t >= 5600 ){
126      printf ("grade 6");
127     }
128      else {
129          printf("grade 5");
130      }
131  }
```

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS

PS D:\c++\Asssignment> cd "d:\c++\Asssignment\" ; if ($?) { gcc assing4.c -o assing4 } ; if ($?) { .\assing4 }
51 1 5700
grade 7
```

```c
#include <stdio.h>
int main (){
    int h , c , t ;
    scanf("%d%f%d", &h , &c , &t);
   if (h>=50 && c <= 0.7 && t >= 5600 ){
    printf ("grade 10");
   }
   else if (h>=50 && c <= 0.7){
     printf ("grade 9");
   }
      else if (t >= 5600 && c <= 0.7){
     printf ("grade 8");
   }
    else if (h>=50 && t >= 5600){
     printf ("grade 7");
   }
     else if (h>=50 || c <= 0.7 || t >= 5600 ){
    printf ("grade 6");
   }
    else {
        printf("grade 5");
    }}
```

Q10. A library charges a fine for every book returned late. For first 5 days the fine is 50 paise, for 6-10 days fine is one rupee and above 10 days fine is 5 rupees. If you return the book after 30 days your me/membership will be cancelled. Write a program to accept the number of days the member is late to return the book and display the fine or the appropriate message.

Ans:

```
133   #include <stdio.h>
134   int main (){
135       int l;
136       scanf ("%d", &l);
137       if (l==5){
138           printf ("50 paise fine");
139       }
140       else if (l>=6 && l <=10){
141           printf ("1 Rupees fine");
142       }
143       else if (l >= 10 && l < 30){
144           printf ("5 Rupees fine");
145       }
146       else if (l >= 30){
147           printf  ("Your membership is cancelled");
148       }
149   }
```

```
PROBLEMS   OUTPUT   DEBUG CONSOLE   TERMINAL   PORTS

PS D:\c++\Asssignment> cd "d:\c++\Asssignment\" ; if ($?) { gcc assing4.c -o assing4 } ; if ($?) { .\assing4 }
12
5 Rupees fine
PS D:\c++\Asssignment> cd "d:\c++\Asssignment\" ; if ($?) { gcc assing4.c -o assing4 } ; if ($?) { .\assing4 }
35
Your membership is cancelled
PS D:\c++\Asssignment>
```

```c
#include <stdio.h>
int main (){
    int l;
    scanf ("%d", &l);
    if (l==5){
        printf ("50 paise fine");
    }
    else if (l>=6 && l <=10){
        printf ("1 Rupees fine");
    }
    else if (l >= 10 && l < 30){
        printf ("5 Rupees fine");
    }
    else if (l >= 30){
        printf  ("Your membership is cancelled");
    }
}
```

Q11. Given the coordinates (x, y) of a center of a circle and its radius, write a program which will determine whether a point lies inside the circle, on the circle or outside the circle. (Hint: Use sqrt() and pow() functions).

Ans:

```c
#include <stdio.h>
#include <math.h>
int main (){
int x1, x2 , y1 , y2 , r ;
printf ("enter coordinates of circle:");
scanf ("%d%d", &x1 , &x2);
printf ("enter the radious:");
scanf ("%d", &r);
printf ("coordinates of the points:");
scanf ("%d%d",&x2 , &y2);
int pc  = sqrt(pow(x2-x1,2)+ pow(y2-y1,2));
 if (pc<r){
    printf ("inside");
 }
 else if (pc > r){
    printf ("outside");
 }
    else if (pc ==r){
        printf("on the line");
    }
    else{
        printf("Wrong Entry");
 }
}
```

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS

PS D:\c++\Asssignment> cd "d:\c++\Asssignment\" ; if ($?) { gcc assing4.c -o assing4 } ; if ($?) { .\assing4 }
enter coordinates of circle:0 0
enter the radious:5
coordinates of the points:0 7
outside
PS D:\c++\Asssignment>
```


```c
#include <stdio.h>
#include <math.h>
int main (){
int x1, x2 , y1 , y2 , r ;
printf ("enter coordinates of circle:");
scanf ("%d%d", &x1 , &x2);
printf ("enter the radious:");
scanf ("%d", &r);
printf ("coordinates of the points:");
scanf ("%d%d",&x2 , &y2);
int pc  = sqrt(pow(x2-x1,2)+ pow(y2-y1,2));
 if (pc<r){
    printf ("inside");
 }
 else if (pc > r){
    printf ("outside");
```

```
 }
    else if (pc ==r){
        printf("on the line");
    }
    else{
        printf("Wrong Entry");
 }
}
```

Q12. Given a point (x, y), write a program to find out if it lies on the x-axis, y-axis or at the origin, viz. (0, 0).

Ans :

```
177  #include <stdio.h>
178  int main (){
179      int x1 , y1;
180      printf ("enter coordinates of the point ");
181      scanf ("%d%d", &x1 , &y1);
182          if (x1 ==0){
183              printf ("lies on y axis");
184          }
185          else if (y1 == 0){
186              printf ("lies on x axis");
187          }
188          else if (x1 == 0 && y1 == 0){
189              printf ("lies on origin");
190          }
191          else {
192              printf ("invalid input");
193          }
194  }
```

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS

PS D:\c++\Asssignment> cd "d:\c++\Asssignment\" ; if ($?) { gcc assing4.c -o assing4 } ; if ($?) { .\assing4 }
enter coordinates of the point 0 9
lies on y axis
```

```
#include <stdio.h>
int main (){
    int x1 , y1;
    printf ("enter coordinates of the point ");
    scanf ("%d%d", &x1 , &y1);
        if (x1 ==0){
            printf ("lies on y axis");
        }
        else if (y1 == 0){
            printf ("lies on x axis");
        }
        else if (x1 == 0 && y1 == 0){
            printf ("lies on origin");
```

```
        }
        else {
            printf ("invalid input");
        }
}
```

Q13. Write a C program to input a character from user and check whether the given character is alphabet or not, using if else.

Ans :

```
196  #include <stdio.h>
197  int main (){
198      char c;
199      scanf ("%c", &c);
200      if (c >= 'A' && c <='Z' || c >= 'a' && c <='z'){
201          printf ("YES");
202      }
203      else {
204          printf ("no");
205      }
206  }
```

```
PROBLEMS   OUTPUT   DEBUG CONSOLE   TERMINAL   PORTS

4.c -o assing4 } ; if ($?) { .\assing4 }
F
YES
PS D:\c++\Asssignment> cd "d:\c++\Asssignment\" ; if ($?) { gcc assing4.c -o assing4 } ; if ($?) { .\assing4 }
y
YES
```

```
#include <stdio.h>
int main (){
    char c;
    scanf ("%c", &c);
    if (c >= 'A' && c <='Z' || c >= 'a' && c <='z'){
        printf ("YES");
    }
    else {
        printf ("no");
    }
}
```

Q14. Write a C program to check whether an alphabet is vowel or consonant using if else.

Ans:

```c
#include <stdio.h>
int main (){
    char c ;
    scanf ("%c", &c);
    if (c>='a' && c<='z'){
        if (c == 'a' ||  c == 'e' || c == 'i' || c == 'o' ||  c == 'u'){
           printf ("its vowel");
    }
    else {
        printf ("consonant");
    }
    }
    else {
        printf ("invalid");
    }
   return 0;
}
```

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS

PS D:\c++\Asssignment> cd "d:\c++\Asssignment\" ; if ($?) { gcc assing4.c -o assing4 } ; if ($?) { .\assing4 }
s
consonant
PS D:\c++\Asssignment> cd "d:\c++\Asssignment\" ; if ($?) { gcc assing4.c -o assing4 } ; if ($?) { .\assing4 }
a
its vowel
PS D:\c++\Asssignment>
```


```c
#include <stdio.h>
int main (){
    char c ;
    scanf ("%c", &c);
    if (c>='a' && c<='z'){
        if (c == 'a' ||  c == 'e' || c == 'i' || c == 'o' ||  c == 'u'){
           printf ("its vowel");
    }
    else {
        printf ("consonant");
    }
    }
    else {
        printf ("invalid");
    }
   return 0;
}
```

Q15. Write a C program to input character from user and check whether character is uppercase or lowercase alphabet using if else.

Ans :

```
226  #include <stdio.h>
227  int main (){
228      char c;
229      scanf("%c",&c);
230      if (c<='Z' && c>='A'){
231          printf ("UPPER CASE");
232      }
233      else if (c<='z' && c>='a'){
234          printf ("LOWER CASE");
235      }
236      else {
237          printf ("invalid");
238      }
239  }
```

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS

PS D:\c++\Asssignment> cd "d:\c++\Asssignment\" ; if ($?) { gcc assing4.c -o assing4 } ; if ($?) { .\assing4 }
C
UPPER CASE
```

```c
#include <stdio.h>
int main (){
    char c;
    scanf("%c",&c);
    if (c<='Z' && c>='A'){
        printf ("UPPER CASE");
    }
    else if (c<='z' && c>='a'){
        printf ("LOWER CASE");
    }
    else {
        printf ("invalid");
    }
}
```

Q16. Write a C program to input electricity unit charge and calculate the 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.

ANS:

```c
#include <stdio.h>
int main (){
    float uc , bill;
    scanf ("%f", &uc);
    if (uc <= 50){
       bill = uc*0.50;
    }
    else if (uc <= 100 && uc >50){
       bill = uc*0.50 + (uc - 50)*0.75;
    }
    else if (uc <= 200 && uc >100){
        bill = uc*(0.50 + 0.75)+(uc - 50 - 100)*1.2;
    }
    else if  (uc >=200){
        bill = uc*(0.50 + 0.75 + 1.5)+(uc - 50 - 200)*1.5;
    }
        else {
            printf("error");
        }
        bill = bill + bill*0.2;
        printf ("bill : %f \n", bill);
    }
```

```c
#include <stdio.h>
int main (){
    float uc , bill;
    scanf ("%f", &uc);
    if (uc <= 50){
       bill = uc*0.50;
    }
    else if (uc <= 100 && uc >50){
       bill = uc*0.50 + (uc - 50)*0.75;
    }
    else if (uc <= 200 && uc >100){
        bill = uc*(0.50 + 0.75)+(uc - 50 - 100)*1.2;
    }
    else if  (uc >=200){
        bill = uc*(0.50 + 0.75 + 1.5)+(uc - 50 - 200)*1.5;
    }
        else {
            printf("error");
        }
        bill = bill + bill*0.2;
        printf ("bill : %f \n", bill);
    }
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
PS D:\c++\Asssignment> cd "d:\c++\Asssignment\" ; if ($?) { gcc assing4.c -o assing4 } ; if ($?) { .\assing4 }
50
bill : 30.000000
PS D:\c++\Asssignment> cd "d:\c++\Asssignment\" ; if ($?) { gcc assing4.c -o assing4 } ; if ($?) { .\assing4 }
300
bill : 1080.000000
```