NATIONAL UNIVERSITY OF COMPUTER &EMERGING SCIENCES PESHAWAR CAMPUS

Programming fundamentals(PF)

Assignment #02

Submitted BY

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Submitted to

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PROBLEM#1

```c
//This program is written by "Hassan Sardar"  roll no. "22p-9108".
//This program will tell us about the winning team .

#include<stdio.h>
int main()
{
int score, wickets;
printf("Enter the score:");
scanf("%d",&score);

printf("Enter the wickets:");
scanf("%d",&wickets);

if(wickets<0)    //wickets must be greater then 0.
printf("Wickets must be greater than zero\n");
if(score<0)     // score must be greater then 0
printf("Score must be greater than zero\n");

if(score>300)            // if score is greater then 300 then Pakistan has won
the match.
printf("Pakistan won by %d Wickets\n",wickets);
else if(score<300&&wickets>0)           // if score is less then 300 and there
are remaining wickets then Pakistan need runs to win.
printf("Pakistan need %d runs to win while having %d wickets\n",300-
score,wickets);
else if(score<300&&wickets==0)           // if score is less then 300 and
there are no remaining wickets then India has won the match.
printf("Pakistan need %d runs with %d wickets\n",300-score,wickets);
else if(score==300&&wickets==0)
printf("Match is draw\n");
return 0;
}
```

OUTPUT

```
hassan@hassan-HP-Pavilion-Laptop-15-eh1xxx:~/Desktop/pf_assg2$ gcc prb1.c -o prb1.out
hassan@hassan-HP-Pavilion-Laptop-15-eh1xxx:~/Desktop/pf_assg2$ ./prb1.out
Enter the score:321
Enter the wickets:1
Pakistan won by 1 Wickets
hassan@hassan-HP-Pavilion-Laptop-15-eh1xxx:~/Desktop/pf_assg2$ ./prb1.out
Enter the score:299
Enter the wickets:0
Pakistan need 1 runs with 0 wickets
hassan@hassan-HP-Pavilion-Laptop-15-eh1xxx:~/Desktop/pf_assg2$ ./prb1.out
Enter the score:300
Enter the wickets:0
Match is draw
hassan@hassan-HP-Pavilion-Laptop-15-eh1xxx:~/Desktop/pf_assg2$
```

PROBLEM#2

```c
//This program is written by "Hassan Sardar"  roll no. "22p-9108".
//This program will tell us the appropriate seminar fee.

#include<stdio.h>
int main()
{
char membership;
int age;
printf("Please enter your age:");
scanf("%d",&age);
printf("please enter your membership status    M  for member    and  N for
non-member:");
scanf("\n%c",&membership);

if(membership=='n'||membership=='N')
printf("\nyour fee is 20$\n");

else if(membership=='M'||membership=='m')
{
     if(age<65)
     printf("\nyour fee is 10$\n");
     else if(age>=65)
     printf("\nYour fee is 5$ \n");
}


return 0;
}
```

OUTPUT

```
hassan@
hassan@hassan-HP-Pavilion-Laptop-15-eh1xxx:~/Desktop/pf_assg2$ gcc prb2.c -o prb2.out
hassan@hassan-HP-Pavilion-Laptop-15-eh1xxx:~/Desktop/pf_assg2$ ./prb2.out
Please enter your age:65
please enter your membership satus    M  for member    and  N for non-member:m

Your fee is 5$
hassan@hassan-HP-Pavilion-Laptop-15-eh1xxx:~/Desktop/pf_assg2$ ./prb2.out
Please enter your age:64
please enter your membership satus    M  for member    and  N for non-member:n

your fee is 20$
hassan@hassan-HP-Pavilion-Laptop-15-eh1xxx:~/Desktop/pf_assg2$
```

PROBLEM#3

```c
// This program is written by "Hassan Sardar" roll no."22p-9108".
// This program will calculate the roots and nature of the roots.

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

int main()
{
int a, b, c, disc;
double r1, r2;

printf("Enter the value of a:");
scanf("%d",&a);

printf("\nEnter the value of b:");
scanf("%d",&b);

printf("\nEnter the value of c:");
scanf("%d",&c);

if(a==0||b==0||c==0)
{
printf("values can't be zero\n");
return 0;
}
else if(a<0||b<0||c<0)
{
printf("values must be greater then 0\n");
return 0;
}


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

if(disc>0)
{
r1=((-b+sqrt(disc))/(2*a));
r2=((-b-sqrt(disc))/(2*a));
printf("The roots are real and unequal\nr1:%f\t r2:%f\n",r1,r2);
}

else if(disc<0)
{
r1=((-b+sqrt(-1*disc))/(2*a));
r2=((-b-sqrt(-1*disc))/(2*a));
printf("The roots are imaginay\nr1:%f\t r2:%f\n",r1,r2);
}
```

```c
else if(disc==0)
{
r1=r2=-b/(2*a);
printf("The roots are real\nr1:%f\t r2:%f\n",r1,r2);
}

return 0;
}
```

OUTPUT

```
hassan@hassan-HP-Pavilion-Laptop-15-eh1xxx:~/Desktop/pf_assg2$ gcc prb3.c -o prb3.out -lm
hassan@hassan-HP-Pavilion-Laptop-15-eh1xxx:~/Desktop/pf_assg2$ ./prb3.out
Enter the value of a:-1

Enter the value of b:0

Enter the value of c:1
values can't be zero
hassan@hassan-HP-Pavilion-Laptop-15-eh1xxx:~/Desktop/pf_assg2$ ./prb3.out
Enter the value of a:3

Enter the value of b:4

Enter the value of c:5
The roots are imaginay
r1:0.438875      r2:-1.772208
hassan@hassan-HP-Pavilion-Laptop-15-eh1xxx:~/Desktop/pf_assg2$
```

PROBLEM#4

```c
// This program is written by "Hassan Sardar" roll no."22p-9108".
// This program will calculate highest plaindrome number of  2 Three digits
multiplication.

#include<stdio.h>
int reverse(int n);
int main()
{
```

```c
int a,b;
int flag=0;

for(int i=100;i<=999;i++)
{
     for(int j=100;j<=999;j++)
     {
       a=i*j;
       b=reverse(a);
       if(a==b)
       {
         if(a>flag)
         {
         flag=a;
         }
       }
     }
}

printf("Highest plaindrome number is:%d\n",flag);
return 0;

}


int reverse(int n)
{
int a=n;
int b;
int rev=0;
for(int i=1;a!=0;i++)
{
b=a%10;
a=a/10;
rev=rev*10+b;
}
return rev;
}
```

Output

```
hassan@hassan-HP-Pavilion-Laptop-15-eh1xxx:~/Desktop/pf_assg2$ gcc prb4.c -o prb4.out
hassan@hassan-HP-Pavilion-Laptop-15-eh1xxx:~/Desktop/pf_assg2$ ./prb4.out
Highest plaindrome number is:906609
hassan@hassan-HP-Pavilion-Laptop-15-eh1xxx:~/Desktop/pf_assg2$
```

PROBLEM#5

```c
//This program is written by "Hassan Sardar" roll no."22p-9108".
// This program will calculate highly divisible triangular number.

#include<stdio.h>
int main()
{
int a, count, flag;
for(int i=1;flag<=5 ; i++)
{
   count=0;
   a=0;
     for(int j=1;j<=i;j++)
     {
        a=a+j;
      }
      for(int k=1;k<=a;k++)
      {
        if(a%k==0)
        {
           count ++;
        }
        }
       if(count>10)
       {
       printf("%d:",a);
        for(int l=1;l<=a;l++)
         {
          if(a%l==0)
           printf("%d  ",l);
         }
         printf("\n");
         flag++;
       }
}

 return 0;
}
```

OUTPUT

```
hassan@hassan-HP-Pavilion-Laptop-15-eh1xxx:~/Desktop/pf_assg2$ gcc prb5.c -o prb5.out
hassan@hassan-HP-Pavilion-Laptop-15-eh1xxx:~/Desktop/pf_assg2$ ./prb5.out
120:1  2  3  4  5  6  8  10  12  15  20  24  30  40  60  120
210:1  2  3  5  6  7  10  14  15  21  30  35  42  70  105  210
276:1  2  3  4  6  12  23  46  69  92  138  276
300:1  2  3  4  5  6  10  12  15  20  25  30  50  60  75  100  150  300
378:1  2  3  6  7  9  14  18  21  27  42  54  63  126  189  378
528:1  2  3  4  6  8  11  12  16  22  24  33  44  48  66  88  132  176  264  528
hassan@hassan-HP-Pavilion-Laptop-15-eh1xxx:~/Desktop/pf_assg2$
```

PROBLEM#6

```c
//This program is written by "Hassan Sardar" roll no."22p-9108".
// This program will calculate the distance between two points and tell us
number of steps.

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

int main()
{

int x1=0, y1=0;
int x2, y2;
float dist, a=0;
int count=0;


for(int i=1; ;i++)
{
 printf("Enter the value of x:");
 scanf("%d",&x2);
 printf("Enter the value of y:");
 scanf("%d",&y2);
      if(x1==x2&&y1==y2)
         break;

      else
      {
         dist=sqrt(((x1-x2)*(x1-x2))+((y1-y2)*(y1-y2)));
         a=a+dist;
         count++;
      }
 x1=x2;
 y1=y2;
}
if(count==0)
{
 printf("Total distance traveled:0.000\nNo.of steps:0\n");
 printf("Average distance traveled:0.000\n");
}
else
{
printf("Total distance traveled:%0.3f\nNo.of steps:%d\n",a,count);
printf("Average distance traveled:%0.3f\n",a/count);
}

return 0;
}
```

OUTPUT

```
hassan@hass
hassan@hassan-HP-Pavilion-Laptop-15-eh1xxx:~/Desktop/pf_assg2$ gcc prb6.c -o prb6.out -lm
hassan@hassan-HP-Pavilion-Laptop-15-eh1xxx:~/Desktop/pf_assg2$ ./prb6.out
Enter the value of x:0
Enter the value of y:0
Total distance traveled:0.000
No.of steps:0
Average distance traveled:0.000
hassan@hassan-HP-Pavilion-Laptop-15-eh1xxx:~/Desktop/pf_assg2$ ./prb6.out
Enter the value of x:1
Enter the value of y:2
Enter the value of x:3
Enter the value of y:4
Enter the value of x:3
Enter the value of y:4
Total distance traveled:5.064
No.of steps:2
Average distance traveled:2.532
hassan@hassan-HP-Pavilion-Laptop-15-eh1xxx:~/Desktop/pf_assg2$
```

PROBLEM#7

(i)

```c
//This program is written by "Hassan Sardar"  roll no. "22p-9108".
//This program will draw the pattern "i".

#include<stdio.h>
int main()
{
for(int i=1;i<=5;i++)
{
   for(int j=1;j<=i;j++)
   printf("%d",i);
printf("\n");
}
return 0;
}
```

OUTPUT

```
hassan@ha
hassan@hassan-HP-Pavilion-Laptop-15-eh1xxx:~/Desktop/pf_assg2$ gcc prb7a.c -o prb7a.out
hassan@hassan-HP-Pavilion-Laptop-15-eh1xxx:~/Desktop/pf_assg2$ ./prb7a.out
1
22
333
4444
55555
hassan@hassan-HP-Pavilion-Laptop-15-eh1xxx:~/Desktop/pf_assg2$
```

(ii)

```c
//This program is written by "Hassan Sardar"  roll no. "22p-9108".
//This program will draw the pattern "ii".

#include<stdio.h>
int main()
{
for(int i=1;i<=5;i++)
{

   for(int j=5;j>i;j--)
   printf(" ");
   for(int k=1;k<=i;k++)
   printf("%d",k);
printf("\n");
}
return 0;
}
```

OUTPUT

```
hassan@hassan-HP-Pavilion-Laptop-15-eh1xxx:~/Desktop/pf_assg2$ gcc prb7b.c -o prb7b.out
hassan@hassan-HP-Pavilion-Laptop-15-eh1xxx:~/Desktop/pf_assg2$ ./prb7b.out
    1
   12
  123
 1234
12345
hassan@hassan-HP-Pavilion-Laptop-15-eh1xxx:~/Desktop/pf_assg2$
```

(iii)

```c
//This program is written by "Hassan Sardar"  roll no. "22p-9108".
//This program will draw the pattern  "iii".

#include<stdio.h>
int main()
{
for(int i=65;i<=69;i++)
{
   for(char j=65;j<=i;j++)
   printf("%c",j);
printf("\n");
}
return 0;
}
```

OUTPUT

```
hassan@hassan-HP-Pavilion-Laptop-15-eh1xxx:~/Desktop/pf_assg2$ gcc prb7c.c -o prb7c.out
hassan@hassan-HP-Pavilion-Laptop-15-eh1xxx:~/Desktop/pf_assg2$ ./prb7c.out
A
AB
ABC
ABCD
ABCDE
hassan@hassan-HP-Pavilion-Laptop-15-eh1xxx:~/Desktop/pf_assg2$
```

(iv)

```c
//This program is written by "Hassan Sardar"  roll no. "22p-9108".
//This program will draw the pattern "iv".

#include<stdio.h>
int main()
{
for(int i=1;i<=5;i++)
{

   for(int j=5;j>i;j--)
   printf(" ");
   for(int k=1;k<=i;k++)
   printf("%d",k);
   for(int l=i-1;l>=1;l--)
   printf("%d",l);

printf("\n");
}
return 0;
}
```

OUTPUT

```
hassan@hassan-HP-Pavilion-Laptop-15-eh1xxx:~/Desktop/pf_assg2$ gcc prb7d.c -o prb7d.out
hassan@hassan-HP-Pavilion-Laptop-15-eh1xxx:~/Desktop/pf_assg2$ ./prb7d.out
    1
   121
  12321
 1234321
123454321
hassan@hassan-HP-Pavilion-Laptop-15-eh1xxx:~/Desktop/pf_assg2$
```

(v)

```c
//This program is written by "Hassan Sardar"  roll no. "22p-9108".
//This program will draw the pattern "v".

#include<stdio.h>
int main()
{
for(int i=0;i<=6-1;i++)
 {
        for(int j=0;j<=i; j++)
          printf(" ");
        for(char k=65;k<=(70-i);k++)
          printf("%c ",k);

 printf("\n");
}
return 0;
}
```

OUTPUT

```
hassan@hassan-HP-Pavilion-Laptop-15-eh1xxx:~/Desktop/pf_assg2$ gcc prb7e.c -o prb7e.out
hassan@hassan-HP-Pavilion-Laptop-15-eh1xxx:~/Desktop/pf_assg2$ ./prb7e.out
A B C D E F
 A B C D E
  A B C D
   A B C
    A B
     A
```

(vi)

```c
//This program is written by "Hassan Sardar"  roll no. "22p-9108".
//This program will draw the pattern "vi".

#include<stdio.h>
int main()
{
for(int i=1;i<=4;i++)
{
   for(int j=i; j<=4; j++)
      printf("*");
   for(int k=1; k<=(2*i-2); k++)
      printf(" ");
   for(int l=i; l<=4; l++)
```

```
      printf("*");

printf("\n");
}
return 0;
}
```

OUTPUT

```
hassan@hassan-HP-Pavilion-Laptop-15-eh1xxx:~/Desktop/pf_assg2$ gcc prb7f.c -o prb7f.out
hassan@hassan-HP-Pavilion-Laptop-15-eh1xxx:~/Desktop/pf_assg2$ ./prb7f.out
********
***  ***
**    **
*      *
hassan@hassan-HP-Pavilion-Laptop-15-eh1xxx:~/Desktop/pf_assg2$
```

(vii)

```
//This program is written by "Hassan Sardar"  roll no.  "22p-9108".
//This program will print the given pattern"vii".
#include <stdio.h>
int main()
{
for(int i=1; i<=10; i++)
{
   for(int j=10; j>=1; j--)
     {
       if(i==1 || i==10 || i==j)   // because  asterisks will be printed at
the top most and bottom line and one diagonal line.
       printf("*");

       else

       printf("
");

     }
printf("\n");
}
return 0;
}
```

OUTPUT

```
hassan@hassan-HP-Pavilion-Laptop-15-eh1xxx:~/Desktop/pf_assg2$ gcc prb7g.c -o prb7g.out
hassan@hassan-HP-Pavilion-Laptop-15-eh1xxx:~/Desktop/pf_assg2$ ./prb7g.out
**********
         *
        *
       *
      *
     *
    *
   *
  *
 *
**********
hassan@hassan-HP-Pavilion-Laptop-15-eh1xxx:~/Desktop/pf_assg2$
```

(viii)

```c
//This program is written by "Hassan Sardar"  roll no.  "22p-9108".
//This program will print the given pattern"viii".

#include <stdio.h>
int main()
{
for(int i=1; i<=10; i++)
{
   for(int j=1; j<=10; j++)
    {
      if(j==1 || j==10 || i==1 || i==10)         //Because asterisks will be
printed at top, bottom and on both sides.
      printf("*");
      else
      printf(" ");
    }
printf("\n");
}
    return 0;
}
```

OUTPUT

```
hassan@hassan-HP-Pavilion-Laptop-15-eh1xxx:~/Desktop/pf_assg2$ gcc prb7h.c -o prb7h.out
hassan@hassan-HP-Pavilion-Laptop-15-eh1xxx:~/Desktop/pf_assg2$ ./prb7h.out
**********
*        *
*        *
*        *
*        *
*        *
*        *
*        *
*        *
**********
hassan@hassan-HP-Pavilion-Laptop-15-eh1xxx:~/Desktop/pf_assg2$
```