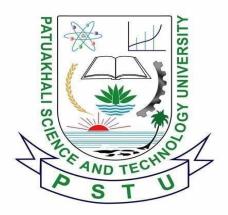
PATUAKHALI SCIENCE AND TECHNOLOGY UNIVERSITY



Course Code: CIT-112

SUBMITTED TO:

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Programming exercise

4.1~A~program~displays~the~right-most~digit~of~the~integral~part~of~the~number~finclude<stdio.h>

```
int main()

{

int a,e;

printf("Enter the value of a\n");

scanf("%d",&a);

e=a%10;

if(a>10)

printf("%d\n%d\n",a,e);

}
```

```
Enter the value of a

3412

3412

2
```

4.2 Modify the above program to display the two right most digits of the integral part #include < stdio.h >

```
int main()

{

int a,e;

printf("Enter the value of a\n");

scanf("%d",&a);

e=a%100;

if(a>100)

printf("%d\n%d\n",a,e);

}
```

```
Enter the value of a 3421 3421 21

Process returned 0 (0x0) execution time : 3.500 s Press any key to continue.
```

4.3 Given an integer number, write a program that displays the number as follows: First line : all digits Second line : all except first digit Third line : all except first two digits

```
#include<stdio.h>
int main()
{
    int n,i,x;
    printf("Enter the number: ");
    scanf("%d",&n);
    for(i=n;i>=1;i--)
    {
        for(x=1;x<=i;x++)
        {
        printf("%d",x);
        }
        printf("\n");
    }
}</pre>
```

```
Enter the number: 5
1 2 3 4 5
1 2 3 4
1 2 3
1 2
1

Process returned 0 (0x0) execution time: 6.500 s
Press any key to continue.
```

4.4 a program to determine the salvage value of an item when the purchase price, years of service, and the annual depreciation are given

```
#include<stdio.h>
int main()
{
    //pp= purchase price;sv=salvage value;yos=years of service;
    //dep=Depreciation
    float pp,sv,yos;
    float dep
    printf("Enter Purchase Price: ");
    scanf("%f",&pp);
    printf("Enter Depreciation: ");
    scanf("%f",&dep);
    printf("Enter Years of service: ");
    scanf("%f",&yos);
    sv=pp-(yos*dep);
    printf("Salvage value = %0.2f",sv);
}
```

```
Enter Purchase Price: 31212
Enter Depreciation: 21
Enter Years of service: 32
Salvage value = 30540.00
Process returned 0 (0x0) execution time: 5.265 s
Press any key to continue.
```

```
4.6 The total distance travelled by a vehicle in t seconds
#include<stdio.h>
int main()
  //a=acceleration;t=time;u=initial velocity;d=distance;
  float d,t,a,u;
  printf("Enter Initial velocity: ");
  scanf("%f",&u);
  printf("Enter Acceleration: ");
  scanf("%f",&a);
  printf("Enter time: ");
  scanf("%f",&t);
  d=(u*t+(a*t*t)/2);
  printf("The distance is : %0.3f",d);
}
  "E:\codeblock c\assingment 2 X
 Enter Initial velocity: 0
 Enter Acceleration: 5
 Enter time: 3
 The distance is : 22.500
                                    execution time : 13.344 s
 Process returned 0 (0x0)
 Press any key to continue.
```

4.7 a program to compute EOQ and TBO, given demand rate (items per unit time), setup costs (per order), and the holding cost (per item per unit time).

```
#include<stdio.h>
int main()
/*
demand rate=dr; setup cost = sc; holding cost per item per unit time = hc;
*/
  float TBO,EOQ,dr,sc,hc;
  printf("Enter demand rate: ");
  scanf("%f",&dr);
  printf("Enter setup cost: ");
  scanf("%f",&sc);
  printf("Enter holding cost per item per unit time: ");
  scanf("%f",&hc);
  EOQ = sqrt((2*dr*sc)/(hc));
  TBO = sqrt((2*sc)/(dr*hc));
  printf("TBO is: %0.3f\n",TBO);
  printf("EOQ is : %0.3f\n",EOQ);
```

```
Enter demand rate: .1
Enter setup cost: 1200
Enter holding cost per item per unit time: 10
TBO is : 48.990
EOQ is : 4.899

Process returned 0 (0x0) execution time : 16.783 s
Press any key to continue.
```

 $4.8\,$ a program to calculate the frequency for different values of C starting from $0.01\,$ to $0.1\,$ in steps of $0.01.\,$

```
#include<stdio.h>
int main()
{
    double r,c,l,fr;
    //r=resistance;l=inductance;c=capacitance;fr=frequency;
    printf("Enter resistance: ");
    scanf("%lf",&r);
    printf("Enter inductance: ");
    scanf("%lf",&l);
    printf("Enter capacitance from 0.01 to 0.1: ");
    scanf("%lf",&c);
    fr=sqrt((1/(l*c))-((r*r)/(4*c*c)));
    printf("The Frequency is %0.2lf",fr);
}
```

```
4.9 a program to read a four digit integer and print the sum of its digits
#include<stdio.h>
int main()
  int n,sum=0,r,x;
  printf("Enter a number of four digits: ");
  scanf("%d",&n);
  while(n!=0){
  r=n\%10;
  sum=sum+r;
  n=n/10;
  printf("Sum of digits are : %d",sum);
}
  □ "E:\codeblock c\assingment 2 ×
 Enter a number of four digits: 1254
 Sum of digits are : 12
 Process returned 0 (0x0)
                                   execution time : 4.281 s
 Press any key to continue.
```

4.10 a program to read three values from keyboard and print out the largest of them without using if statement.

```
#include<stdio.h>
int main()
{
    int n1,n2,n3;
    printf("Enter 1st number: \n");
    scanf("%d",&n1);
    printf("Enter 2nd number: \n");
    scanf("%d",&n2);
    printf("Enter 3rd number: \n");
    scanf("%d",&n3);
int maximum = (n1> n2) ? ((n1 > n3) ? n1 : n3) : ((n2 > n3) ? n2 : n3);
    printf("Maximum value is : %d",maximum);
}
```

```
Enter 1st number:

123
Enter 2nd number:

222
Enter 3rd number:

321
Maximum value is: 321
Process returned 0 (0x0) execution time: 6.821 s
Press any key to continue.
```

4.11 a program to read two integer values m and n and to decide and print whether m is a multiple of n.

```
#include<stdio.h>
int main()
{
    int m,n;
    printf("Enter a number(n): ");
    scanf("%d",&n);
    m=n*n;
    printf("The value of n is %d\n",n);
    printf("The value of m is %d\n",m);
}
```

```
Enter a number(n): 6
The value of n is 6
The value of m is 36

Process returned 0 (0x0) execution time : 1.032 s
Press any key to continue.
```

4.12 a program to read three values using scanf statement and print the following results: (a) Sum of the values (b) Average of the three values (c) Largest of the three (d) Smallest of the three

```
#include<stdio.h>
int main()
  int n1,n2,n3;
  printf("Enter 1st number: \n");
  scanf("%d",&n1);
  printf("Enter 2nd number: \n");
  scanf("%d",&n2);
  printf("Enter 3rd number: \n");
  scanf("%d",&n3);
  if(n1>n2\&\&n1>n3)
    printf("%d is large number. \n",n1);
  else if(n2>n1\&\&n2>n3)
    printf("%d is large number. \n",n2);
  else
    printf("%d is large number. \n",n3);
  printf("\n'n");
    if(n1 < n2 & n1 < n3)
    printf("%d is small number. \n",n1);
  else if(n2 < n1 \& n2 < n3)
    printf("%d is small number. \n",n2);
  else
     printf("%d is small number. \n",n3);
  printf("\n'");
  int sum=n1+n2+n3;
```

```
float av= sum/3;

printf("The sum of three digits are: %d\n\n",sum);

printf("The average of three digits are: %f\n\n",av);
}
```

```
Enter 1st number:
31
Enter 2nd number:
321
Enter 3rd number:
33
321 is large number.

31 is small number.

The sum of three digits are: 385
The average of three digits are: 128.000000

Process returned 0 (0x0) execution time: 5.781 s
Press any key to continue.
```

4.14 a program to print a table of sin and cos functions for the interval from 0 to 180 degrees in increments of 15

```
#include<stdio.h>
#include<math.h>
int main()
{
    float x,y,i;
    printf("Angle sin(Angle) cos(Angle)\n");
    for(i=0;i<=180;i=i+15)
    {
        x=sin(i);
        y=cos(i);
        printf("%0.2f %0.2f\n",i,x,y);
    }
```

```
□ "E:\codeblock c\assingment 2 ×
Angle
            sin(Angle)
                             cos(Angle)
                               1.00
0.00
               0.00
15.00
                 0.65
                                 -0.76
30.00
                 -0.99
                                 0.15
45.00
                 0.85
                                 0.53
60.00
                 -0.30
                                  -0.95
75.00
                 -0.39
                                 0.92
90.00
                                 -0.45
                 0.89
105.00
                 -0.97
                                   -0.24
120.00
                 0.58
                                  0.81
135.00
                 0.09
                                  -1.00
150.00
                 -0.71
                                   0.70
165.00
                                  -0.07
                  1.00
180.00
                  -0.80
                                   -0.60
                            execution time : 0.016 s
Process returned 0 (0x0)
Press any key to continue.
```

4.15 a program to compute the values of square2roots and squares of the numbers 0 to 100 in steps 10 and print the output in a tabular form

```
#include<stdio.h>
int main()
{
    float i,x,y;
    printf("Value square squareroot\n");
    for(i=0;i<=100;i=i+10)
    {
        x=i*i;
        y=sqrt(i);
        printf("%0.2f %0.2f %0.2f\n",i,x,y);
    }
}</pre>
```

}

```
□ "E:\codeblock c\assingment 2 ×
Value
            square
                         squareroot
0.00
           0.00
                       0.00
10.00
            100.00
                          3.16
20.00
            400.00
                          4.47
30.00
            900.00
                          5.48
40.00
            1600.00
                            6.32
50.00
             2500.00
                            7.07
60.00
            3600.00
                            7.75
70.00
            4900.00
                            8.37
                            8.94
80.00
            6400.00
                            9.49
90.00
            8100.00
100.00
              10000.00
                              10.00
                             execution time : 0.017 s
Process returned 0 (0x0)
Press any key to continue.
```

4.17 a C program to shift the given data by two bits to the left.

```
#include<stdio.h>
int main(){
  int d =5;
  printf("%d",(d<<2));
}</pre>
```

```
E:\codeblock c\assingment 2 × + | ν

20

Process returned θ (θxθ) execution time : θ.θ16 s

Press any key to continue.
```

```
4.18 a C program to compute the value of the expression x=a-b/3+c*2-1.
#include<stdio.h>
int main()
  float a,b,c,x;
  printf("Enter a: ");
  scanf("%f",&a);
  printf("Enter b: ");
  scanf("%f",&b);
  printf("Enter c: ");
  scanf("%f",&c);
  x=a-b/3+c*2-1;
  printf("The value of x is = \%0.2f",x);
}
  © 1 "E:\codeblock c\assingment 2 ×
Enter a: 23
Enter b: 21
Enter c: 21
The value of x is = 57.00
Process returned 0 (0x0)
                                   execution time : 5.094 s
Press any key to continue.
```

 $4.20\,\mathrm{a}$ C program to input a date value and determine whether the entered day, month, and year values are valid.

```
#include<stdio.h>
int main()
{
    int year,t,rd,rd2,month,week,days;
    printf("Enter days numbers: ");
    scanf("%d",&t);
    //rh=remain second after getting hours
    year=t/365;
    rd=t%365;
    month=rd/30;
    rd2=rd%30;
    week=rd2/7;
    days=rd2%7;
    printf("Days are %d years, %d months, %d weeks, %d days",year,month,week,days);
    return 0;
}
```

```
Enter days numbers: 2321

Days are 6 years, 4 months, 1 weeks, 4 days

Process returned 0 (0x0) execution time : 3.328 s

Press any key to continue.
```

4.20 a C program to input the sides of a triangle and determine whether the triangle is isoceles or not.

```
#include <stdio.h>
int main() {
  int side1, side2, side3;
  // Read the lengths of three sides of the triangle
  printf("Enter the lengths of three sides of the triangle: ");
  scanf("%d %d %d", &side1, &side2, &side3);
  // Check if the triangle is isosceles or not
  if (side1 == side2 \parallel side1 == side3 \parallel side2 == side3) {
    printf("The triangle is isosceles.");
  } else {
    printf("The triangle is not isosceles.");
  }
  return 0;
}
 "E:\codeblock c\assingment 2 X
Enter the lengths of three sides of the triangle: 43
12
33
The triangle is not isosceles.
                                    execution time : 7.375 s
Process returned 0 (0x0)
Press any key to continue.
```

4.21 a C program that reads two numbers and performs their division. If the division is not possible, then an error message, 'Division not possible' is displayed.

```
#include<stdio.h>
int main()
{
    float x,y,z;
    printf("Enter 1st value: ");
    scanf("%f",&x);
    printf("Enter 2nd value: ");
    scanf("%f",&y);
    z=x/y;
    if(y==0)
        printf("division not possible");
    else
        printf("The division value is: %0.2f",z);
}
```

```
Enter 1st value: 32
Enter 2nd value: 122
The division value is : 0.26
Process returned 0 (0x0) execution time : 3.922 s
Press any key to continue.
```

```
4.22 the value of 4 variables a, b, c and d and compute the resultant value of following expressions: (a +
b) * (c / d) (a + b) * c / d a + (b * c) / d
#include<stdio.h>
int main()
  float x,y,z,a,b,c,d;
  printf("Enter a: ");
  scanf("%f",&a);
  printf("Enter b: ");
  scanf("%f",&b);
  printf("Enter c: ");
  scanf("%f",&c);
  printf("Enter d: ");
  scanf("%f",&d);
  x=(a+b)*(c/d);
  y=(a+b)*c/d;
  z=a+(b*c)/d;
  printf("The 1st value is: \%0.2f\n",x);
  printf("The 2nd value is: %0.2f\n",y);
  printf("The 3rd value is: %0.2f\n",z);
}
```

```
"E:\codeblock c\assingment 2 × + v

Enter a: 42
Enter b: 31
Enter c: 22
Enter d: 23
The 1st value is: 69.83
The 2nd value is: 69.83
The 3rd value is: 71.65

Process returned 0 (0x0) execution time: 6.937 s
Press any key to continue.
```

Other programming exercise

```
#include<stdio.h>
int main()
{
    int i,j,n;
    printf("Enter raw number: ");
    scanf("%d",&n);
    for(i=1;i<=n;i++)
    {
        for(j=1;j<=i;j++)
        {
            printf("%d ",j);
        }
        printf("\n");
        }
}</pre>
```

```
Enter raw number: 6

1

1 2

1 2 3

1 2 3 4

1 2 3 4 5

1 2 3 4 5

1 2 3 4 5 6

Process returned θ (θxθ) execution time : 2.289 s

Press any key to continue.
```

```
#include<stdio.h>
int main()
  int n,r,c;
  printf("Enter raw number:");
  scanf("%d",&n);
  for(r=1;r<=n;r++)
     for(c=1;c<=n-r;c++)
        printf(" ");
     for(c=1;c<=r;c++)
        printf("%d ",c);
  printf("\n");
  for(r=n-1;r>=1;r--)
     for(c=n-r;c>=1;c--)
        printf(" ");
     for(c=1;c\leq=r;c++)
        printf("%d ",c);
  printf("\n");

    "E:\codeblock c\assingment 2 × + ∨

Enter raw number:6
 Process returned 0 (0x0) execution time : 0.797 s
Press any key to continue.
```

```
#include<stdio.h>
int main()
{
    int r,c,n;
    printf("Enter raw number: ");
    scanf("%d",&n);
    for(r=1;r<=n;r++)
    {
        for(c=1;c<=n;c++)
        printf("*");
        printf("\n");
    }
}</pre>
```

```
Enter raw number: 7

* * * * * * * *

* * * * * * * *

* * * * * * *

* * * * * * *

* * * * * * *

Process returned 0 (0x0) execution time : 1.328 s

Press any key to continue.
```

```
4. Pattern 4
   #include<stdio.h>
   int main()
     int n,r,c;
     printf("Enter raw number: ");
     scanf("%d",&n);
     for(r=1;r<=n;r++)
     {
       for(c=1;c<=n-r;c++)
          printf(" ");
       for(c=1;c<=r;c++)
          printf("* ");
   printf("\n");
     "E:\codeblock c\assingment 2 X
    Enter raw number: 5
                                    execution time : 2.095 s
    Process returned 0 (0x0)
    Press any key to continue.
```

```
"E:\codeblock c\assingment 2 × + \vert vertex raw number: 5

* * * * * *

* * * *

* * *

* * *

Process returned 0 (0x0) execution time : 1.016 s

Press any key to continue.
```

```
6. Pattern 6
```

```
#include<stdio.h>
int main()
  int r,c,n;
  printf("Enter raw number: ");
  scanf("%d",&n);
  for(r=1;r<=n;r++)
  {
     for(c=1;c<=n;c++)
       if( r==1 || r==n || c==1 || c==n || c==r)
       printf(" *");
       else
       printf(" ");
     printf("\n");
}
```

```
Enter raw number: 6

* * * * * *

* * * *

* * * *

* * * *

Process returned 0 (0x0) execution time : 1.000 s

Press any key to continue.
```

```
7. Pattern 7
#include<stdio.h>
int main()
  int r,c,n;
  printf("Enter raw number: ");
  scanf("%d",&n);
  for(r=1;r<=n;r++)
  {
     for(c=1;c<=n;c++)
       if( r+c==n+1 \parallel c==r)
       printf("*");
       else
       printf(" ");
     printf("\n");
```

}

```
Enter raw number: 6

* *

* *

**

**

**

**

Process returned 0 (0x0) execution time : 1.922 s

Press any key to continue.
```

```
8. Pattern 8
   #include<stdio.h>
int main()
{
  int n,r,c,count=0;
  printf("Enter n: ");
  scanf("%d",&n);
  for(r=1;r<=n;r++)
  {
     for(c=1;c<=r;c++)
       count++;
       printf("%d ",count);
       printf("\n");
  }
}
  "E:\codeblock c\assingment 2 X
Enter n: 7
2 3
4 5 6
7 8 9 10
11 12 13 14 15
   17 18 19 20 21
22 23 24 25 26 27 28
Process returned \theta (\theta x \theta)
                               execution time : 21.946 s
 Press any key to continue.
```

9. Point grading system

```
#include<stdio.h>
int main()
  int mark;
  printf("Enter Your Marks: ");
  scanf("%d",&mark);
  if (\text{mark} \ge 80)
    printf("You got A+");
  else if (mark>=70 && mark<<80)
    printf("You got A");
  else if (mark>=65&& mark<<70)
    printf("You got A-");
  else if (mark>=60&& mark<<65)
    printf("You got B");
  else if (mark>=50&& mark<<60)
    printf("You got C");
  else if (mark>=40&& mark<<50)
    printf("You got D");
  else if (mark>=33&& mark<<40)
    printf("You got E");
  else
    printf("Failed in exam");
```

```
"E:\codeblock c\assingment 2 × + v

Enter Your Marks: 87

You got A+

Process returned 0 (0x0) execution time : 2.960 s

Press any key to continue.
```

10. SUM with pointer

```
#include<stdio.h>
int main()
  int x,y,sum;
  int *ptr1,*ptr2;
  printf("Enter two numbers: ");
  scanf("%d %d",&x,&y);
  ptr1=&x;
  ptr2=&y;
  sum= *ptr1 + *ptr2;
  printf("The sum is %d",sum);

□□ "E:\codeblock c\assingment 2 ×

 Enter two numbers: 45
 The sum is 77
 Process returned 0 (0x0)
                              execution time : 4.177 s
 Press any key to continue.
```