****

NAME : Pradip S Karmakar

ROLL NO : 10

CLASS : MCA-II

SUBJECT : Computer Oriented Numerical Methods (CONM)

****

1. Apply Bisection method to solve the algebraic equation

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

double fun(double x)
{
        double funx;
        funx=x*log(x)-1.2;
        return funx;
}

void content(double a,double b)
{
        double c;
        int no=0;

        printf("Enter Value of a:");
        scanf("%lf",&a);
        printf("\nEnter Value of b:");
        scanf("%lf",&b);
        //currunt - previos < epsilon
//epsilon have to be in macro
```

```
//function evaluation (divide by zero error) in the function
	while((fun(a)*fun(b))>0)
	{
		printf("\nInvalid input!");

		printf("\nEnter Value of a:");
		scanf("%lf",&a);
		printf("\nEnter Value of b:");
		scanf("%lf",&b);
	}
		c=(a+b)/2;

		printf("\nNO\tA\t\tf(A)\t\tB\t\tf(B)\t\tC\t\tf(C)\n");
		printf("\n-----------------------------------------------------------------------------------------------------
---");
		while(fabs(fun(c))>0.0000005)
		{
			fun(c);
			if((fun(a)>0 && fun(c)>0) || (fun(a)<0 && fun(c)<0))
			{
				a=c;
			}
			if((fun(b)<0 && fun(c)<0) || (fun(b)>0 && fun(c)>0))
			{
				b=c;
			}
			c=(a+b)/2;

	printf("\n%d\t%lf\t%lf\t%lf\t%lf\t%lf\t%lf\n",no++,a,fun(a),b,fun(b),c,fun(c));
		}

}
```

```
void main()
{
        double a=0,b=0;

        content(a,b);

        getch();
}
```

****

OUTPUT:

****

Enter Value of a:1

Enter Value of b:2

NO	A	f(A)	B	f(B)	C	f(C)
0	1.500000	-0.591802	2.000000	0.186294	1.750000	-0.220672
1	1.750000	-0.220672	2.000000	0.186294	1.875000	-0.021359
2	1.875000	-0.021359	2.000000	0.186294	1.937500	0.081460
3	1.875000	-0.021359	1.937500	0.081460	1.906250	0.029794
4	1.875000	-0.021359	1.906250	0.029794	1.890625	0.004153
5	1.875000	-0.021359	1.890625	0.004153	1.882813	-0.008619

6	1.882813	-0.008619	1.890625	0.004153	1.886719	-0.002237
7	1.886719	-0.002237	1.890625	0.004153	1.888672	0.000957
8	1.886719	-0.002237	1.888672	0.000957	1.887695	-0.000640
9	1.887695	-0.000640	1.888672	0.000957	1.888184	0.000158
10	1.887695	-0.000640	1.888184	0.000158	1.887939	-0.000241
11	1.887939	-0.000241	1.888184	0.000158	1.888062	-0.000041
12	1.888062	-0.000041	1.888184	0.000158	1.888123	0.000059
13	1.888062	-0.000041	1.888123	0.000059	1.888092	0.000009
14	1.888062	-0.000041	1.888092	0.000009	1.888077	-0.000016
15	1.888077	-0.000016	1.888092	0.000009	1.888084	-0.000004
16	1.888084	-0.000004	1.888092	0.000009	1.888088	0.000002
17	1.888084	-0.000004	1.888088	0.000002	1.888086	-0.000001
18	1.888086	-0.000001	1.888088	0.000002	1.888087	0.000001
19	1.888086	-0.000001	1.888087	0.000001	1.888087	0.000000

****

NAME : Pradip S Karmakar

ROLL NO : 10

CLASS : MCA-II

SUBJECT : Computer Oriented Numerical Methods (CONM)

****

2. Apply Bisection method to solve the algebraic equation

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

double fun(double x)
{
        double funx;
        funx=(x*x*x)-x-1;
        return funx;
}

void content(double a,double b)
{
        double c;
        int no=0;

        printf("Enter Value of a:");
        scanf("%lf",&a);
        printf("\nEnter Value of b:");
        scanf("%lf",&b);

        while((fun(a)*fun(b))>0)
```

```
	{
		printf("\nInvalid input!");

		printf("\nEnter Value of a:");
		scanf("%lf",&a);
		printf("\nEnter Value of b:");
		scanf("%lf",&b);
	}
		c=(a+b)/2;

		printf("\nNO\tA\t\tf(A)\t\tB\t\tf(B)\t\tC\t\tf(C)\n");
		printf("\n-----------------------------------------------------------------------------------------------
---");
		while(fabs(fun(c))>0.0000005)
		{
			fun(c);
			if((fun(a)>0 && fun(c)>0) || (fun(a)<0 && fun(c)<0))
			{
				a=c;
			}
			if((fun(b)<0 && fun(c)<0) || (fun(b)>0 && fun(c)>0))
			{
				b=c;
			}
			c=(a+b)/2;

	printf("\n%d\t%lf\t%lf\t%lf\t%lf\t%lf\t%lf\n",no++,a,fun(a),b,fun(b),c,fun(c));
		}
}
void main()
{
	double a=0,b=0;
```

```
        content(a,b);

        getch();
}
```

****

OUTPUT:

****

```
Enter Value of a:0

Enter Value of b:1

Invalid input!
Enter Value of a:1

Enter Value of b:2

NO    A          f(A)         B          f(B)         C          f(C)

-------------------------------------------------------------------------------------------------

0     1.000000   -1.000000    1.500000   0.875000     1.250000   -0.296875

1     1.250000   -0.296875    1.500000   0.875000     1.375000   0.224609

2     1.250000   -0.296875    1.375000   0.224609     1.312500   -0.051514

3     1.312500   -0.051514    1.375000   0.224609     1.343750   0.082611

4     1.312500   -0.051514    1.343750   0.082611     1.328125   0.014576
```

5	1.312500	-0.051514	1.328125	0.014576	1.320313	-0.018711
6	1.320313	-0.018711	1.328125	0.014576	1.324219	-0.002128
7	1.324219	-0.002128	1.328125	0.014576	1.326172	0.006209
8	1.324219	-0.002128	1.326172	0.006209	1.325195	0.002037
9	1.324219	-0.002128	1.325195	0.002037	1.324707	-0.000047
10	1.324707	-0.000047	1.325195	0.002037	1.324951	0.000995
11	1.324707	-0.000047	1.324951	0.000995	1.324829	0.000474
12	1.324707	-0.000047	1.324829	0.000474	1.324768	0.000214
13	1.324707	-0.000047	1.324768	0.000214	1.324738	0.000084
14	1.324707	-0.000047	1.324738	0.000084	1.324722	0.000018
15	1.324707	-0.000047	1.324722	0.000018	1.324715	-0.000014
16	1.324715	-0.000014	1.324722	0.000018	1.324718	0.000002
17	1.324715	-0.000014	1.324718	0.000002	1.324717	-0.000006
18	1.324717	-0.000006	1.324718	0.000002	1.324718	-0.000002
19	1.324718	-0.000002	1.324718	0.000002	1.324718	0.000000

****

NAME : Pradip S Karmakar

ROLL NO : 10

CLASS : MCA-II

SUBJECT : Computer Oriented Numerical Methods (CONM)

****

3. Apply False Position method to solve the algebraic equation

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

double fun(double x)
{
        double funx;
        funx=x*log10(x)-1.2;
        return funx;
}

void content(double a,double b)
{
        double c;
        int no=0;

        printf("Enter Value of a:");
        scanf("%lf",&a);
        printf("\nEnter Value of b:");
        scanf("%lf",&b);
```

```
	while((fun(a)*fun(b))>0)
	{
		printf("\nInvalid input!\n");

		printf("\nEnter Value of a:");
		scanf("%lf",&a);
		printf("\nEnter Value of b:");
		scanf("%lf",&b);
	}
		c=((b*(fun(a)))-(a*(fun(b))))/((fun(a))-(fun(b)));

		printf("\nNO\tA\t\tf(A)\t\tB\t\tf(B)\t\tC\t\tf(C)\n");
		printf("\n-------------------------------------------------------------------------------------------------
---");
		while(fabs(fun(c))>0.0000005)
		{

	printf("\n%d\t%lf\t%lf\t%lf\t%lf\t%lf\t%lf\n",++no,a,fun(a),b,fun(b),c,fun(c));
			fun(c);
			if((fun(a)>0 && fun(c)>0) || (fun(a)<0 && fun(c)<0))
			{
				a=c;
			}
			if((fun(b)<0 && fun(c)<0) || (fun(b)>0 && fun(c)>0))
			{
				b=c;
			}
			c=((b*(fun(a)))-(a*(fun(b))))/((fun(a))-(fun(b)));
		}
		printf("\n%d\t%lf\t%lf\t%lf\t%lf\t%lf\t%lf\n",++no,a,fun(a),b,fun(b),c,fun(c));
}
void main()
```

```
{
        double a=0,b=0;

        content(a,b);

        getch();
}
```

****

OUTPUT:

****

```
Enter Value of a:2

Enter Value of b:3

NO    A          f(A)        B          f(B)        C          f(C)

-------------------------------------------------------------------------------------------------

1     2.000000   -0.597940   3.000000   0.231364    2.721014   -0.017091

2     2.721014   -0.017091   3.000000   0.231364    2.740206   -0.000384

3     2.740206   -0.000384   3.000000   0.231364    2.740636   -0.000009

4     2.740636   -0.000009   3.000000   0.231364    2.740646   -0.000000
```

****

NAME : Pradip S Karmakar

ROLL NO : 10

CLASS : MCA-II

SUBJECT : Computer Oriented Numerical Methods (CONM)

****

4. Apply Secant method to solve the algebraic equation

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

double fun(double x)
{
        double funx;
        funx=(3*x)-cos(x)-1;
        return funx;
}

void content(double a,double b)
{
        double c;
        int no=0;

        printf("Enter Value of a:");
        scanf("%lf",&a);
        printf("\nEnter Value of b:");
        scanf("%lf",&b);

                c=((a*(fun(b)))-(b*(fun(a))))/((fun(b))-(fun(a)));
```

```
                printf("\nNO\tA\t\tf(A)\t\tB\t\tf(B)\t\tC\t\tf(C)\n");
                printf("\n-----------------------------------------------------------------------------------------------
---");
                while(fabs(fun(c))>0.0000005)
                {
                        fun(c);

        printf("\n%d\t%lf\t%lf\t%lf\t%lf\t%lf\t%lf\n",++no,a,fun(a),b,fun(b),c,fun(c));


                        a = b;
                        b = c;


                        c=((a*(fun(b)))-(b*(fun(a))))/((fun(b))-(fun(a)));
                }
                printf("\n%d\t%lf\t%lf\t%lf\t%lf\t%lf\t%lf\n",++no,a,fun(a),b,fun(b),c,fun(c));
}
void main()
{
        double a=0,b=0;


        content(a,b);


        getch();
}
```

****

OUTPUT:

****

Enter Value of a:0

Enter Value of b:1

NO	A	f(A)	B	f(B)	C	f(C)
1	0.000000	-2.000000	1.000000	1.459698	0.578085	-0.103255
2	1.000000	1.459698	0.578085	-0.103255	0.605959	-0.004081
3	0.578085	-0.103255	0.605959	-0.004081	0.607106	0.000014
4	0.605959	-0.004081	0.607106	0.000014	0.607102	-0.000000

****

NAME : Pradip S Karmakar

ROLL NO : 10

CLASS : MCA-II

SUBJECT : Computer Oriented Numerical Methods (CONM)

****

5. Apply Newton Raphson method to solve the algebraic equation

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

double fun(double x)
{
        double funx;
        funx = (x*x)-5;
        return funx;
}

double derfun(double x)
{
        double funx;
        funx = 2*x;
        return funx;
}

void cntnt(double a)
{
        double c;
        int no=0;
```

```
	printf("Enter Value:");
	scanf("%lf",&a);

	c = a-((fun(a))/(derfun(a)));
	printf("\nNO\tXn\t\tf(Xn)\t\tf'(Xn)\t\tXn+1\n");
	printf("\n----------------------------------------------------------------------------------------------------");

	while(fabs(fun(a))>0.0000005)
	{
		printf("\n%d\t%lf\t%lf\t%lf\t%lf\n",++no,a,fun(a),derfun(a),c);
		a = c;

		c = a-((fun(a))/(derfun(a)));
	}
	printf("\n%d\t%lf\t%lf\t%lf\t%lf\n",++no,a,fun(a),derfun(a),c);
}

void main()
{
	double a=0;

	cntnt(a);

	getch();
}
```

****

OUTPUT:

****

Enter Value:1

NO	Xn	f(Xn)	f'(Xn)	Xn+1
1	1.000000	-4.000000	2.000000	3.000000
2	3.000000	4.000000	6.000000	2.333333
3	2.333333	0.444444	4.666667	2.238095
4	2.238095	0.009070	4.476190	2.236069
5	2.236069	0.000004	4.472138	2.236068
6	2.236068	0.000000	4.472136	2.236068

```
*******************************************************************************
NAME    : Pradip S Karmakar
ROLL NO : 10
CLASS    : MCA-II
SUBJECT  : Computer Oriented Numerical Methods (CONM)

*******************************************************************************
#include<stdio.h>
#include<conio.h>
#include<math.h>
#define epsilone 0.0000005

double fun(double input)
{
        double funx;

        funx = (1+cos(input))/3;

        return funx;
}

void content(double input)
{
        double x;
        int num=1;

        printf("Enter value of X:");
        scanf("%lf",&x);

        printf("\nNO\tX\t\tf(X)\n");
        printf("\n-----------------------------------");
```

```
	while(  fabs(x-(fun(x))) > epsilone )
	{
		if(num > 40)
		{
			break;
		}

		else
		{
			printf("\n%d\t%lf\t%lf\n",num,x,fun(x));
			num++;

			x = fun(x);
		}
	}
}

void main()
{
	double input=0;

	content(input);

	getch();
}
```