

LAB VII

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3. #include<stdio.h>
void valitanh(double,double*,int,int*);
int main()
{
int flag,nterms=20;
double x,val;
printf("Enter the value of x :");
scanf("%lf",&x);
valitanh(x,&val,nterms,&flag);
if(flag==0)
    printf("x is outside the range\n");
else
    printf("Value is %0.4lf\n",val);
return 0;
}

void valitanh(double x,double *val,int n,int *flag)
{
int i;
double t;
*val=0;
if(x>1 || x<-1)
{
*flag=0;
}
else
{
*flag=1;
t = x;
for(i=0;i<n;i++)
{
*val +=t/(double)(2*i+1);
t *=x*x;
}
}
}

4. #include <stdio.h>
#include <stdlib.h>
#include <math.h>
#define N 100
void vecread(double [],char*,int *);
void vecprint(double [],char,int );
int calc(double[],double[],int,int,double *,double *,double*);
void writeoutp(char *,double,double,double,int);
int main()
{
int m,n,flag;
double u[N],v[N],lu,lv,angle;
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vecread(u,"vecu.dat",&m);
vecprint(u,'u',m);
vecread(v,"vecv.dat",&n);
vecprint(v,'v',n);
flag=calc(u,v,m,n,&lu,&lv,&angle);
writeoutp("output.dat",lu,lv,angle,flag);
return 0;
}

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int calc(double u[],double v[],int m,int n,double *adlu,double *adlv,double*adangle)
{
int i;
double s=0;

s=0;
for(i=0;i<m;i++)
{
s +=u[i]*u[i];
}
*adlu = sqrt(s);

s=0;
for(i=0;i<n;i++)
{
s +=v[i]*v[i];
}
*adlv = sqrt(s);

if(m !=n)
{
return 0;
}

s=0;
for(i=0;i<m;i++)
{
s +=u[i]*v[i];
}
*adangle = acos(s/(*adlu * *adlv))*180.0/M_PI;
return 1;

}

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void writeoutp(char *outp,double lu,double lv,double angle,int flag)
{
FILE *fp;
fp=fopen(outp,"w");
if(fp==NULL)
{

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    printf("Error in creating %s\n",outp);
    exit(1);
}

fprintf(fp,"Length of u is %0.4lf\n",lu);
fprintf(fp,"Length of v is %0.4lf\n",lv);
if(flag==1)
{
    fprintf(fp,"The angle between u and v is %0.4lf degrees\n",angle);
}

fclose(fp);
}

void vecread(double u[],char *inp,int *m)
{
    int i,n;
    FILE *fp;
    fp=fopen(inp,"r");
    if(fp==NULL)
    {
        printf("Error in opening %s\n",inp);
        exit(1);
    }

    fscanf(fp,"%d",&n);
    if(n>N)
    {
        printf("Increase array size\n");
        exit(1);
    }
    *m=n;
    for(i=0;i<n;i++)
    {
        fscanf(fp,"%lf",&u[i]);
    }

    fclose(fp);
}

void vecprint(double u[],char vec,int n)
{
    int i;
    printf("The vector %c is :",vec);
    for(i=0;i<n;i++)
    {
        printf("%0.4lf ",u[i]);
    }
    printf("\n");
}

```