

LAB VII

1. Run the following program and examine the output.

17p1.c

2. Run the following program and examine the output.

17p2.c

3. Complete the given code (omitting the comments) with modifications at appropriate places (see the comment parts of the program). The program computes the value of

$$\tanh^{-1} x = \sum_{n=0}^{\infty} \frac{x^{2n+1}}{2n+1}, \quad |x| < 1$$

using a **void** function **valitanh**. After call to the function, integer variable flag will have value **0** if x is outside the range. Otherwise, flag will have value **1** and val will have value of $\tanh^{-1} x$ using **20** terms of the Taylor series. (*Do not* use **pow** function).

q17p3.c

Test data and expected output:

```
Enter the value of x :-2
x is outside the range
```

```
Enter the value of x :0.5
Value is 0.5493
```

```
Enter the value of x :-0.2
Value is -0.2027
```

4. Copy the given code (omitting the comments) with modifications at appropriate places (see the comment parts of the program). After completion of the function **vecread**, m and n contain the actual dimensions of u and v and the respective components are stored in u and v. These are read from the files vecu.dat and vecv.dat. The function **vecprint** prints the respective vectors in the terminal. After completion of the function **calc**, *lu* and *lv* contain the length of the vectors. Further, if flag=1, then angle contains the angle between u and v; otherwise flag=0. After completion of the function **writeoutp**, length of the vectors will be written on output.dat. This file will also contain the angle between the vectors if flag=1. In each input data file, the first line contains the dimension of the vector and the next line contains the components of the vector.

q17p4.c

Expected input: See **vecu.dat** and **vecv.dat**

Expected output:

```
The vector u is :3.0000  -4.0000  7.0000  8.0000  9.0000
The vector v is :4.0000  -5.0000  7.0000  12.0000  9.0000
```

See **output.dat**