DU M.Sc. Physics IV Semester
Advanced Numerical techniques (Lab)
Assignment-1

1. Create separate functions for (a) adding, (b) subtracting, (c) multiplying, (d) printing and (e) finding trace of matrices and (f) transferring elements of one matrix to another. For example:

```
void matprint(float **a,int m,int n)
      { int i,j;
        for (i=1; i<=m; i++)
       { for (j=1; j<=n; j++)
          {printf (   %f\t     ,a[i][j]); }  printf (   \n   ); } }
```

is the function to print an $m \times n$ matrix **a**. The statement (in main) to print a $l \times m$ matrix **x** will simply be **matprint(x,l,m);**. **Note that ** is present along with the name of the matrix in the function but not in the calling program. Also note that most of these programs are of the type void. The value of the calculated matrix is not returned to the main program in the usual way.**
Test each individual function by using it in a short program to check that it is working. Once you have checked all the individual functions, make a file called **matops.c** of these functions by assembling them together. This file obviously cannot be used by itself in a standalone fashion, since it only has functions listed in it. But now, whenever you have any program to write with matrices, you just include this file that is write **#include < matops.c>** in the program and call the relevant functions to carry out print, copy, add or multiply etc. operations on the matrices in your program.

2. Write a program which will generate two 4×4 matrices **a** and **b**, where $a_{ij} = \frac{i}{(i+j)}$ and $b_{ij} = \frac{j}{(i+j)}$, obtain the commutator $c = [a, b]$ and print its elements in a matrix format. Your program should use the program **matops.c** that you have written in the previous problem.

ANT Assignment-1 (KR,AG)