Experiment 1

Recollection of MATLAB Basics

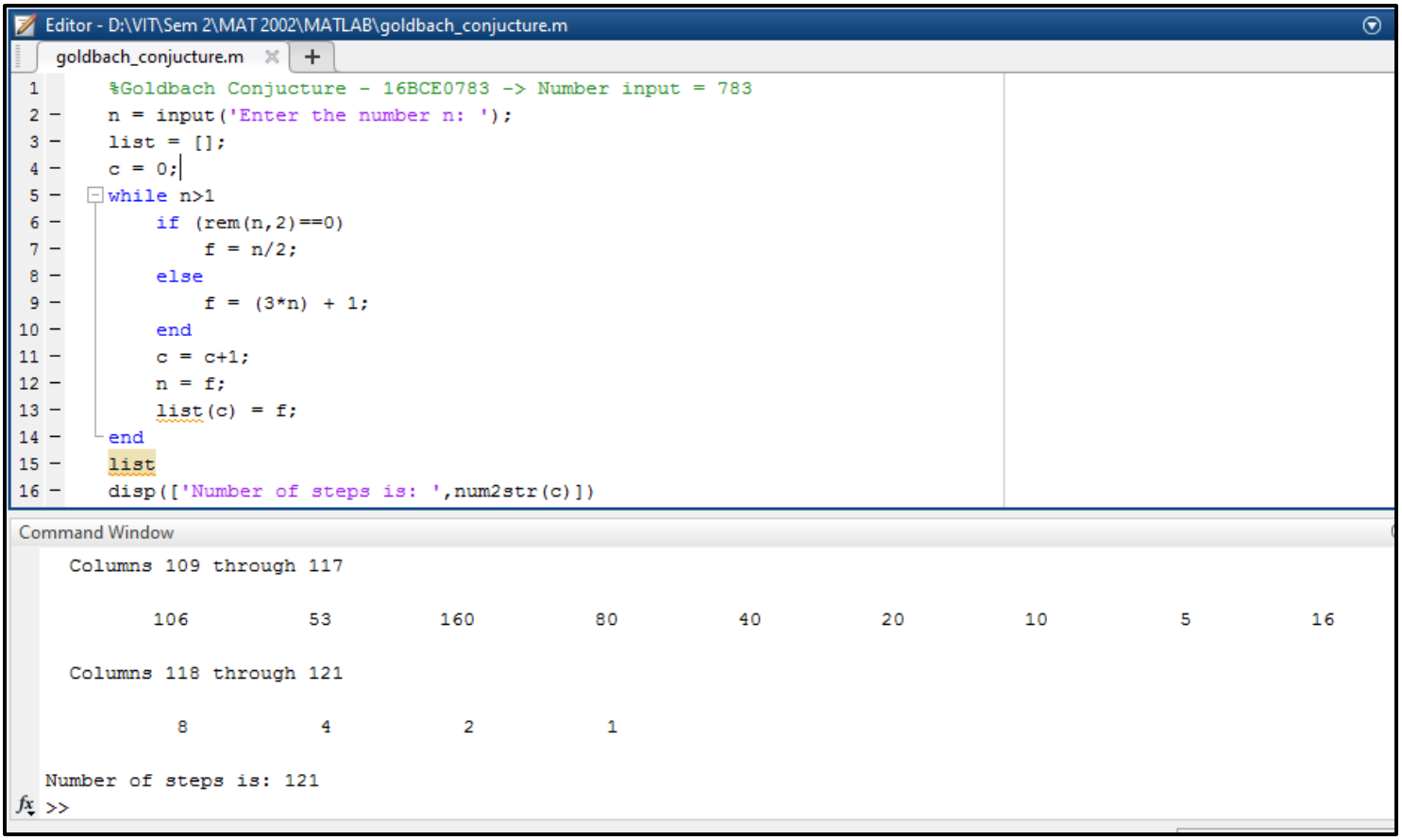
Recollected the basics on Indexing/Slicing/Concatenating of Matrices and Vectors. Also different functions of/on Matrices. Recollected the plotting commands such as plot/plot3/ezplot/surf etc.

Question – 1 Goldbach Conjecture

Code:

```
%Goldbach Conjucture - 16BCE0783 -> Number input = 783
n = input('Enter the number n: ');
list = [];
c = 0;
while n>1
    if (rem(n,2)==0)
        f = n/2;
    else
        f = (3*n) + 1;
    end
    c = c+1;
    n = f;
    list(c) = f;
end
list
disp(['Number of steps is: ',num2str(c)])
```

Output: (Entered n = 783)

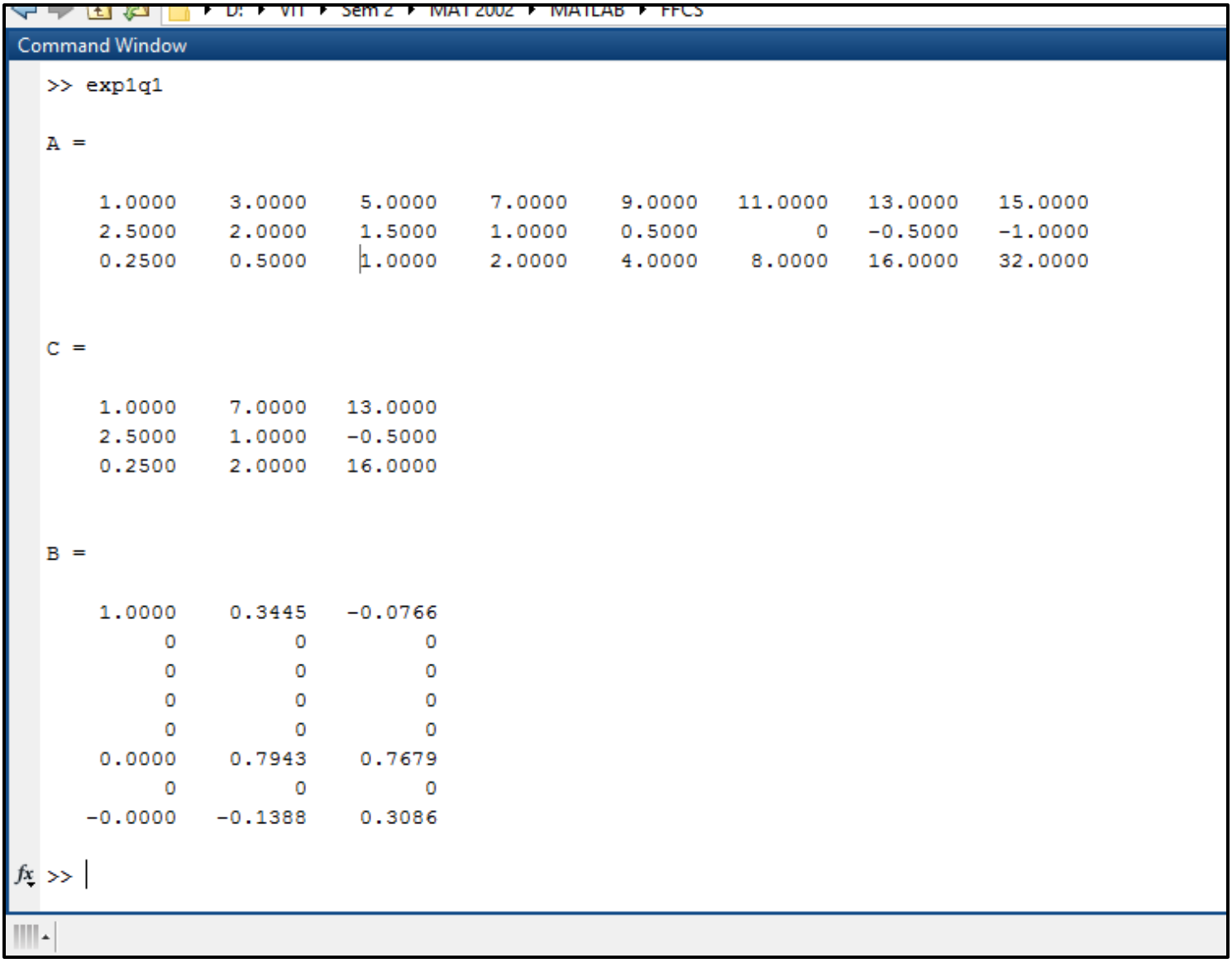


Question 2: AB = C

Code:

```
%Question 1 - 16BCE0783
l = [];
for i=1:8;l(i) = 0.25*(2^(i-1));end
A = cat(1,1:2:15,2.5:-0.5:-1,l)
C = A(:,[1,4,7])
B = A\C
```

Output:



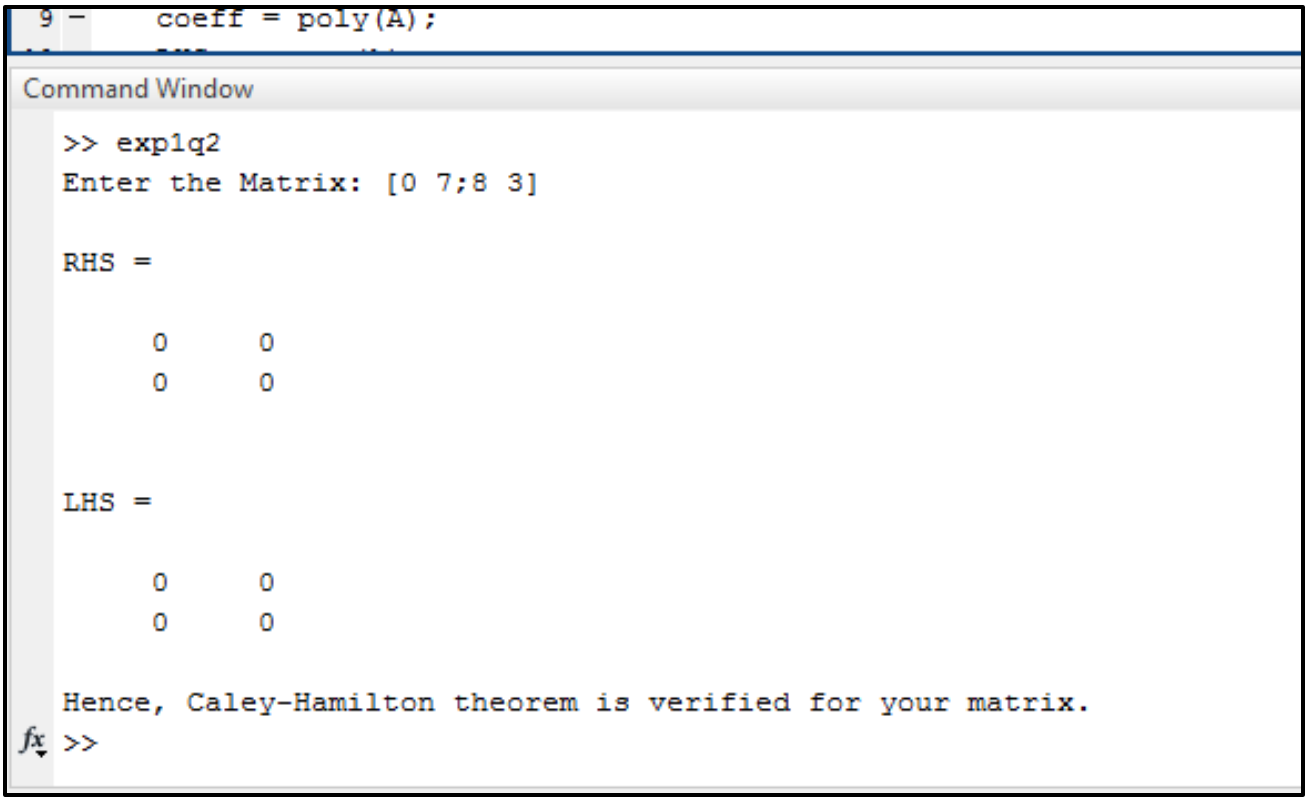
Question 3: Verifying Calyley Hamilton Theorem

Code:

```
%Cayley Hamilton Theorem - 16BCE0783
A = input('Enter the Matrix: ');
k = size(A);
RHS = zeros(k)
if k(1) ~= k(2)
    disp('Not a square matrix!!')
    return;
end
coeff = poly(A);
LHS = zeros(k);
for i=1:numel(coeff)
    LHS = LHS + round(coeff(i))*A^(k(1)+1-i);
end
LHS
if (LHS == RHS)
    disp('Hence, Caley-Hamilton theorem is verified for your matrix.')
else
```

```
   disp('Caley-Hamilton theorem is not verified for your matrix.')
end
```

Input & Output:



Question 4: Newton-Raphson Approximation Method

Code:

```
%Newton - Raphson Approximation - 16BCE0783
syms x
f = input('Input an algebraic or trancedental function of x: ');
a0 = input('Input the value of initial Approximation for your function: ');
l = [a0];
df = diff(f,x);
for i=2:11
    l(i) = l(i-1) - (subs(f,x,l(i-1))/subs(df,x,l(i-1)));
end
disp('The list of roots from x1 to x10 are:')
disp(l(2:11))
fprintf('The fifth root of the given number is %f\n',l(11))
```

Input & Output:

```
12 -    fprintf('The fifth root of the given number is %f\n',l(11))
```

Command Window

```
>> exp1q3
Input an algebraic or trancedental function of x: x^5 - 83
Input the value of initial Approximation for your function: 3
The list of roots from x1 to x10 are:
    2.6049    2.4445    2.4205    2.4200    2.4200    2.4200    2.4200    2.4200    2.4200    2.4200

The fifth root of the given number is 2.420001
>>
```