COL100: Lab 14

April 20, 2017

Part 1: Programming Questions

1. Import numpy library in python and use linalg.solve to find solution for a set of linear equations of the form AX = B (where A is a square matrix). Hence, X = A^{-1}B.

```
import numpy as np
a = np.array([[3,1], [1,2]])
b = np.array([9,8])
x = np.linalg.solve(a, b)
```

2. Plotting using matplotlib: Plot sin(x) and cos(x) in the range 0 to 3π.

```
import numpy as np
import matplotlib.pyplot as plt

# Compute the x and y coordinates for points on sine and cosine curves
x = np.arange(0, 3 * np.pi, 0.1)
y_sin = np.sin(x)
y_cos = np.cos(x)

# Plot the points using matplotlib
plt.plot(x, y_sin)
plt.plot(x, y_cos)
plt.xlabel('x axis label')
plt.ylabel('y axis label')
plt.title('Sine and Cosine')
plt.legend(['Sine', 'Cosine'])
plt.show()
```

3. Write a Python program to find the determinant and inverse of a square matrix.

4. Write a Python program to multiply two matrices.

5. Use the above programs to find a solution for a set of linear equations of the form AX = B. Hence, X = A^{-1}B.

Part 2: Clarify all your doubts