CHRIST

(DEEMED TO BE UNIVERSITY)

DELHI-NCR, INDIA

Advance Python Programming

MCA-372

Assignment – 06

BY

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SUBMITTED TO

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Basemap :

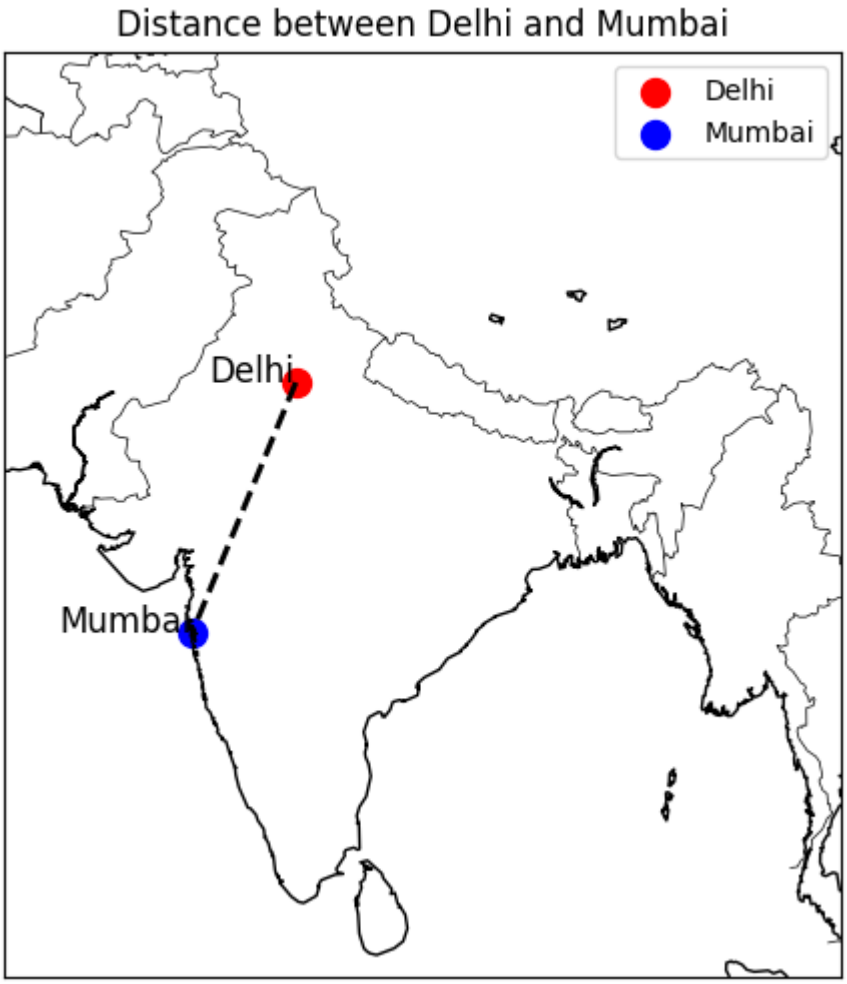
Importing Libraries

```
from mpl_toolkits.basemap import Basemap
import matplotlib.pyplot as plt
```

Que 1 : Implement the below code that shows the connection between cities

```
plt.figure(figsize=(8, 6))
m = Basemap(projection="merc", llcrnrlat=5, urcrnrlat=40, llcrnrlon=65,
urcrnrlon=100, resolution="l")

m.drawcoastlines()
m.drawcountries()
m.drawstates()

delhi = (28.6139, 77.2090)
mumbai = (19.0760, 72.8777)

x_delhi, y_delhi = m(delhi[1], delhi[0])
x_mumbai, y_mumbai = m(mumbai[1], mumbai[0])

m.scatter(x_delhi, y_delhi, marker="o", color="red", s=100, label="Delhi")
m.scatter(x_mumbai, y_mumbai, marker="o", color="blue", s=100, label="Mumbai")

m.plot([x_delhi, x_mumbai], [y_delhi, y_mumbai], linestyle="dashed",
color="black", linewidth=2)

plt.title("Distance between Delhi and Mumbai")
plt.legend()
plt.text(x_delhi, y_delhi, "Delhi", fontsize=12, ha="right")
plt.text(x_mumbai, y_mumbai, "Mumbai", fontsize=12, ha="right")
plt.show()
```

Output :

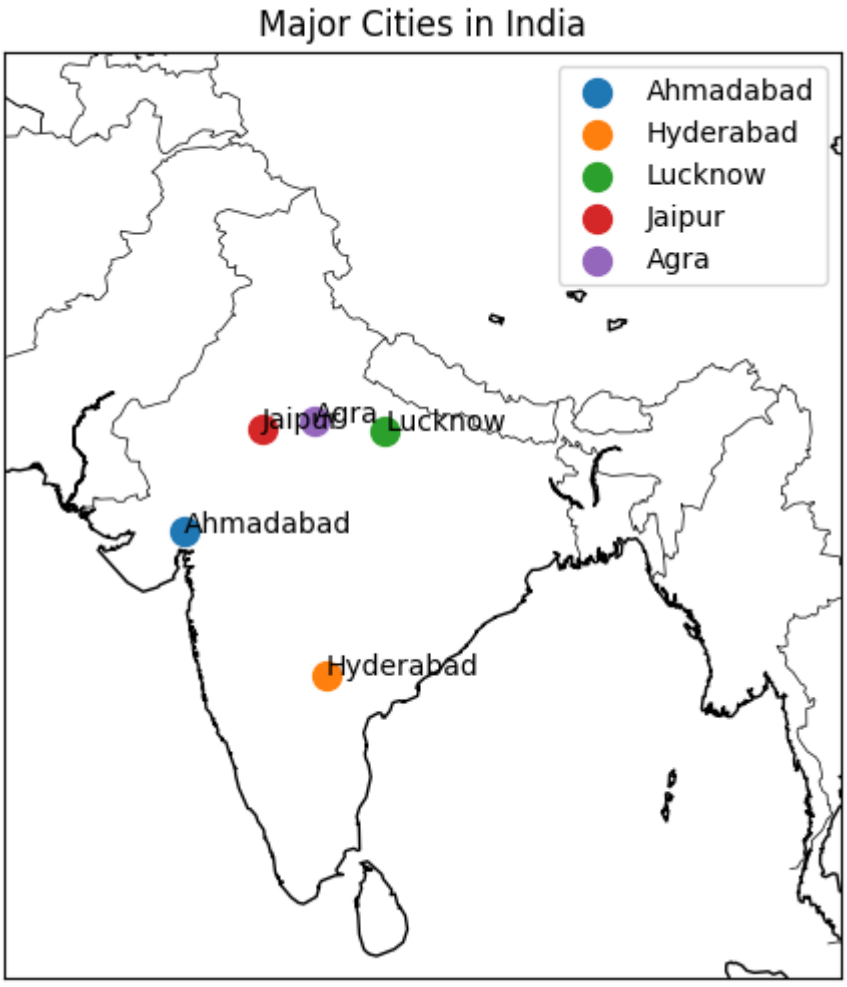


Que 2 : Spot the below cities in the Indian Map Ahmadabad, Hyderabad, Lucknow, Jaipur, Agra

```
plt.figure(figsize=(8, 6))
m = Basemap(projection="merc", llcrnrlat=5, urcrnrlat=40, llcrnrlon=65,
urcrnrlon=100, resolution="l")

m.drawcoastlines()
m.drawcountries()
m.drawstates()

# Coordinates of the cities
cities = {
    "Ahmadabad": (23.0225, 72.5714),
    "Hyderabad": (17.3850, 78.4867),
    "Lucknow": (26.8467, 80.9462),
    "Jaipur": (26.9124, 75.7873),
    "Agra": (27.1767, 78.0081)
}
```

```
# Plot cities on the map
for city, (lat, lon) in cities.items():
    x, y = m(lon, lat)
    m.scatter(x, y, marker='o', s=100, label=city)
    plt.text(x, y, city, fontsize=10, ha='left', color='black')


plt.title("Major Cities in India")
plt.legend()
plt.show()
```

Output :

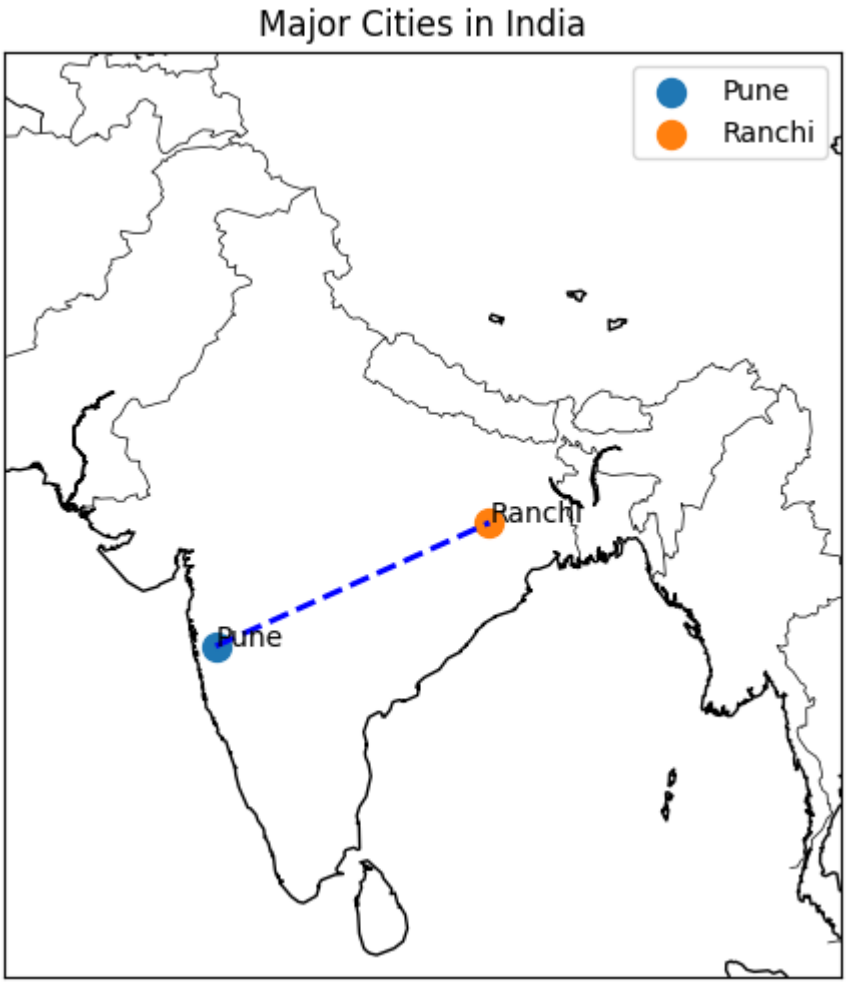


Que 3 : Spot the below cities and connect them Pune to Ranchi

```
import matplotlib.pyplot as plt
from mpl_toolkits.basemap import Basemap
```

```
plt.figure(figsize=(8, 6))
m = Basemap(projection="merc", llcrnrlat=5, urcrnrlat=40, llcrnrlon=65,
urcrnrlon=100, resolution="l")

m.drawcoastlines()
m.drawcountries()
m.drawstates()

# Coordinates of the cities
cities = {
    "Pune": (18.5204, 73.8567),
    "Ranchi": (23.3441, 85.3096)
}

# Plot cities on the map
for city, (lat, lon) in cities.items():
    x, y = m(lon, lat)
    m.scatter(x, y, marker='o', s=100, label=city)
    plt.text(x, y, city, fontsize=10, ha='left', color='black')


# Draw a line between Pune and Ranchi
x_pune, y_pune = m(cities["Pune"][1], cities["Pune"][0])
x_ranchi, y_ranchi = m(cities["Ranchi"][1], cities["Ranchi"][0])
m.plot([x_pune, x_ranchi], [y_pune, y_ranchi], linestyle="dashed",
color="blue", linewidth=2)

plt.title("Major Cities in India")
plt.legend()
plt.show()
```

Output :


Major Cities in India
Pune
Ranchi
Ranchi
Pune