AICP Internship Task Week 3

In [1]:
```
pip install matplotlib
```

```
Collecting matplotlib
  Using cached https://files.pythonhosted.org/packages/ad/62/7b662284352867a86acfb636761ba351723fc3a235efd8397578d903413d/matplotlib-3.5.3-cp37-cp37m-manylinux_2_5_x86_64.manylinux1_x86_64.whl (https://files.pythonhosted.org/packages/ad/62/7b662284352867a86acfb636761ba351723fc3a235efd8397578d903413d/matplotlib-3.5.3-cp37-cp37m-manylinux_2_5_x86_64.manylinux1_x86_64.whl)
Requirement already satisfied: python-dateutil>=2.7 in /snap/jupyter/6/lib/python3.7/site-packages (from matplotlib) (2.8.0)
Requirement already satisfied: kiwisolver>=1.0.1 in /home/malik-m-shahmeer-rashid/snap/jupyter/common/lib/python3.7/site-packages (from matplotlib) (1.4.5)
Collecting packaging>=20.0 (from matplotlib)
  Using cached https://files.pythonhosted.org/packages/ec/1a/610693ac4ee14fcdf2d9bf3c493370e4f2ef7ae2e19217d7a237ff42367d/packaging-23.2-py3-none-any.whl (https://files.pythonhosted.org/packages/ec/1a/610693ac4ee14fcdf2d9bf3c493370e4f2ef7ae2e19217d7a237ff42367d/packaging-23.2-py3-none-any.whl)
Requirement already satisfied: numpy>=1.17 in /home/malik-m-shah
```

In [4]:
```
pip install --upgrade pip
```

```
Collecting pip
  Downloading https://files.pythonhosted.org/packages/8a/6a/19e9fe04fca059ccf770861c7d5721ab4c2aebc539889e97c7977528a53b/pip-24.0-py3-none-any.whl (https://files.pythonhosted.org/packages/8a/6a/19e9fe04fca059ccf770861c7d5721ab4c2aebc539889e97c7977528a53b/pip-24.0-py3-none-any.whl) (2.1MB)
     |████████████████████████████████| 2.1MB 5.8MB/s eta 0:00:01
Installing collected packages: pip
Successfully installed pip-24.0
Note: you may need to restart the kernel to use updated packages.
```

In [5]:
```
pip install pillow
```

```
Collecting pillow
  Downloading Pillow-9.5.0-cp37-cp37m-manylinux_2_17_x86_64.manylinux2014_x86_64.whl (3.3 MB)
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Installing collected packages: pillow
Successfully installed pillow-9.5.0
Note: you may need to restart the kernel to use updated packages.
```

In [6]:
```
pip install matplotlib
```

```
Collecting matplotlib
  Downloading matplotlib-3.5.3-cp37-cp37m-manylinux_2_5_x86_64.man
ylinux1_x86_64.whl (11.2 MB)
     ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 11.2/11.2 MB 3.4 MB/
s eta 0:00:00m eta 0:00:01[36m0:00:01m
Requirement already satisfied: cycler>=0.10 in /home/malik-m-shahm
eer-rashid/snap/jupyter/common/lib/python3.7/site-packages (from m
atplotlib) (0.11.0)
Requirement already satisfied: fonttools>=4.22.0 in /home/malik-m-
shahmeer-rashid/snap/jupyter/common/lib/python3.7/site-packages (f
rom matplotlib) (4.38.0)
Requirement already satisfied: kiwisolver>=1.0.1 in /home/malik-m-
shahmeer-rashid/snap/jupyter/common/lib/python3.7/site-packages (f
rom matplotlib) (1.4.5)
Requirement already satisfied: numpy>=1.17 in /home/malik-m-shahme
er-rashid/snap/jupyter/common/lib/python3.7/site-packages (from ma
tplotlib) (1.21.6)
Requirement already satisfied: packaging>=20.0 in /home/malik-m-sh
ahmeer-rashid/snap/jupyter/common/lib/python3.7/site-packages (fro
m matplotlib) (23.2)
Requirement already satisfied: pillow>=6.2.0 in /home/malik-m-shah
meer-rashid/snap/jupyter/common/lib/python3.7/site-packages (from
matplotlib) (9.5.0)
Requirement already satisfied: pyparsing>=2.2.1 in /home/malik-m-s
hahmeer-rashid/snap/jupyter/common/lib/python3.7/site-packages (fr
om matplotlib) (3.1.1)
Requirement already satisfied: python-dateutil>=2.7 in /snap/jupyt
er/6/lib/python3.7/site-packages (from matplotlib) (2.8.0)
Requirement already satisfied: typing-extensions in /home/malik-m-
shahmeer-rashid/snap/jupyter/common/lib/python3.7/site-packages (f
rom kiwisolver>=1.0.1->matplotlib) (4.7.1)
Requirement already satisfied: six>=1.5 in /snap/jupyter/6/lib/pyt
hon3.7/site-packages (from python-dateutil>=2.7->matplotlib) (1.1
2.0)
Installing collected packages: matplotlib
Successfully installed matplotlib-3.5.3
Note: you may need to restart the kernel to use updated packages.
```

In [2]:
```
import matplotlib.pyplot as plt
```

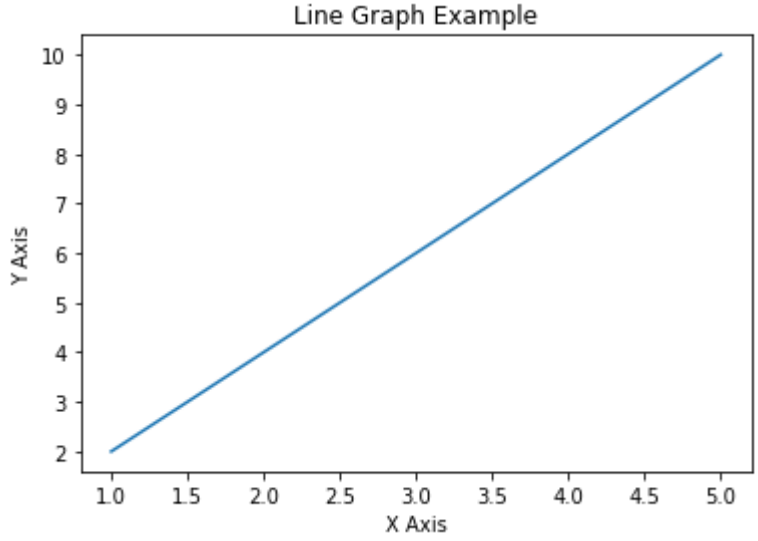
Question#1: Write a Python program to draw a line using given axis values with suitable label in the x axis , y axis and a title.

In [2]:
```
x_values = [1, 2, 3, 4, 5]
y_values = [2, 4, 6, 8, 10]

plt.plot(x_values, y_values)

plt.xlabel('X Axis')
plt.ylabel('Y Axis')
plt.title('Line Graph Example')

plt.show()
```



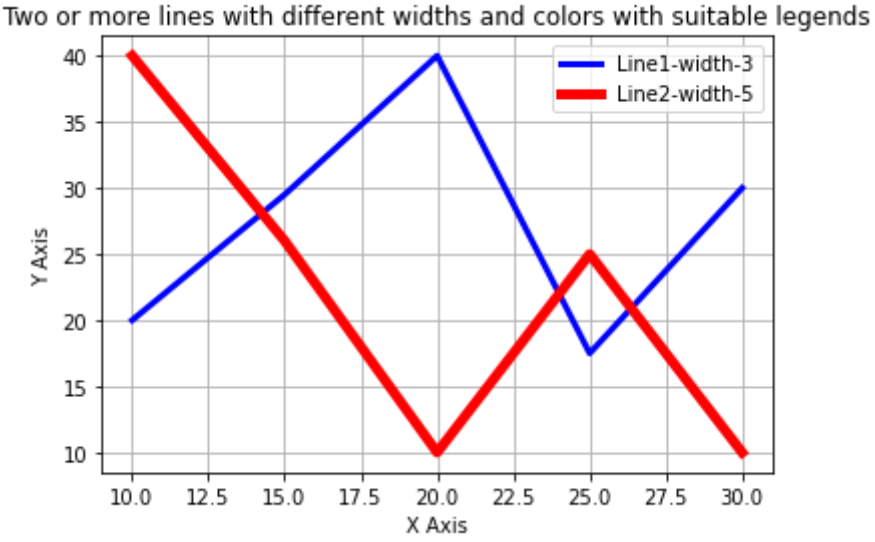
Question#2: Write a Python program to plot two or more lines with legends, different widths and colors.

In [19]:
```
x_values = [10, 15, 20, 25, 30]
y_values1 = [20, 29.5, 40, 17.5, 30]
y_values2 = [40, 26, 10, 25, 10]

plt.plot(x_values, y_values1, label='Line1-width-3', color='blue',
plt.plot(x_values, y_values2, label='Line2-width-5', color='red', l

plt.legend()
plt.xlabel('X Axis')
plt.ylabel('Y Axis')
plt.title('Two or more lines with different widths and colors with

plt.grid(True)
plt.show()
```



Question#3: Write a Python program to plot two or more lines and set the line markers.

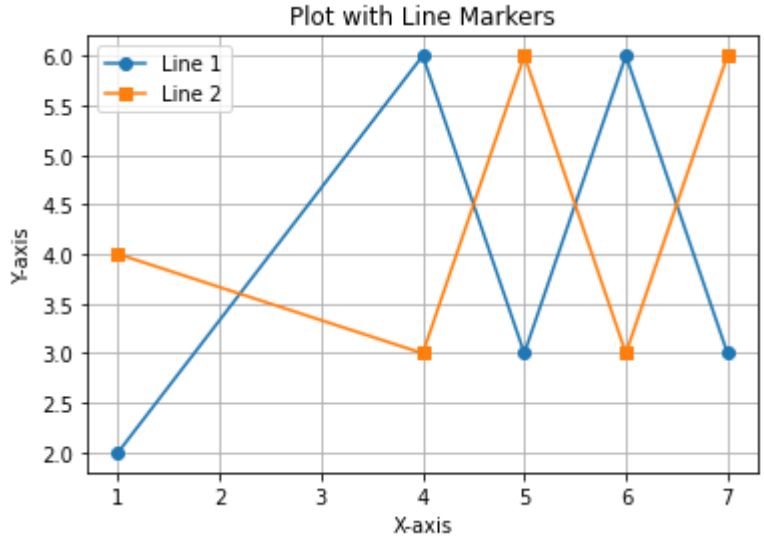
In [7]:
```
x =  [1, 4, 5, 6, 7]
y1 = [2, 6, 3, 6, 3]
y2 = [4, 3, 6, 3, 6]

plt.plot(x, y1, marker='o', label='Line 1')
plt.plot(x, y2, marker='s', label='Line 2')

plt.xlabel('X-axis')
plt.ylabel('Y-axis')
plt.title('Plot with Line Markers')

plt.legend()

plt.grid(True)
plt.show()
```



Question#4: Write a Python program to display a horizontal bar chart of the popularity of programming Languages. Here is sample data:

Programming languages: Java, Python, PHP, JavaScript, C#, C++

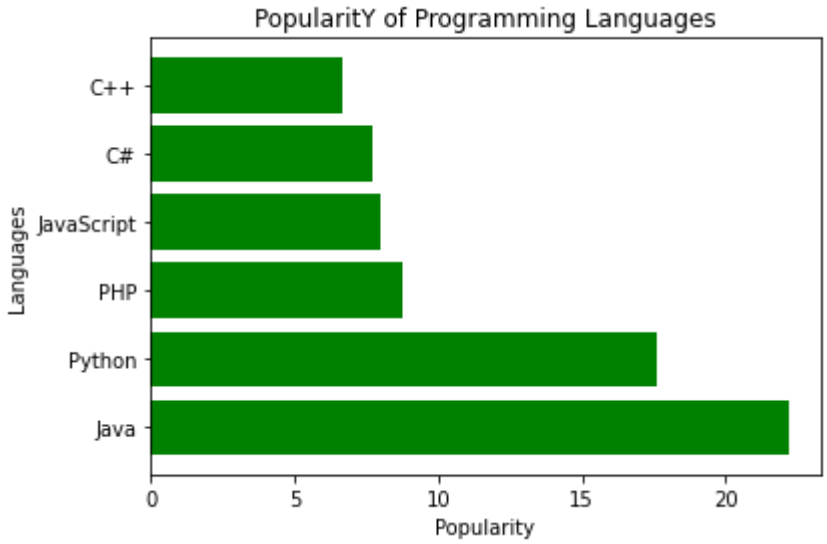
Popularity: 22.2, 17.6, 8.8, 8, 7.7, 6.7

In [15]:
```
languages = ['Java', 'Python', 'PHP', 'JavaScript', 'C#', 'C++']
popularity = [22.2, 17.6, 8.8, 8, 7.7, 6.7]

plt.barh(languages, popularity, color='green')

plt.xlabel('Popularity')
plt.ylabel('Languages')
plt.title('PopularitY of Programming Languages')

plt.show()
```



In [17]:
```
pip install pandas
```

```
Collecting pandas
  Downloading pandas-1.3.5-cp37-cp37m-manylinux_2_17_x86_64.manyli
nux2014_x86_64.whl (11.3 MB)
     ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 11.3/11.3 MB 14.4 k
B/s eta 0:00:00m eta 0:00:01[36m0:00:18
Requirement already satisfied: python-dateutil>=2.7.3 in /snap/jup
yter/6/lib/python3.7/site-packages (from pandas) (2.8.0)
Collecting pytz>=2017.3 (from pandas)
  Downloading pytz-2024.1-py2.py3-none-any.whl.metadata (22 kB)
Requirement already satisfied: numpy>=1.17.3 in /home/malik-m-shah
meer-rashid/snap/jupyter/common/lib/python3.7/site-packages (from
pandas) (1.21.6)
Requirement already satisfied: six>=1.5 in /snap/jupyter/6/lib/pyt
hon3.7/site-packages (from python-dateutil>=2.7.3->pandas) (1.12.
0)
Downloading pytz-2024.1-py2.py3-none-any.whl (505 kB)
     ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 505.5/505.5 kB 6.7 kB/
s eta 0:00:00[31m6.2 kB/s eta 0:00:03m
Installing collected packages: pytz, pandas
Successfully installed pandas-1.3.5 pytz-2024.1
Note: you may need to restart the kernel to use updated packages.
```

Question#5: Write a Python program to create bar plot from a DataFrame. Sample Data Frame: abcde

2 4,8,5,7,6

4 2,3,4,2,6

6 4,7,4,7,8

8 2,6,4,8,6

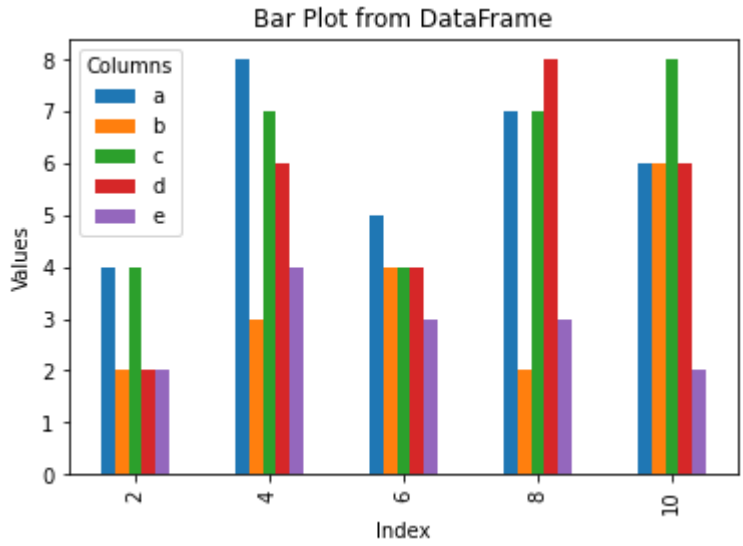
10 2,4,3,3,2

In [3]:
```
import pandas as pd

data = {
    'a': [4, 8, 5, 7, 6],
    'b': [2, 3, 4, 2, 6],
    'c': [4, 7, 4, 7, 8],
    'd': [2, 6, 4, 8, 6],
    'e': [2, 4, 3, 3, 2]
}
index = [2, 4, 6, 8, 10]

df = pd.DataFrame(data, index=index)

df.plot(kind='bar')
plt.xlabel('Index')
plt.ylabel('Values')
plt.title('Bar Plot from DataFrame')
plt.legend(title='Columns')
plt.show()
```



In [10]:
```
pip install odfpy
```

```
Collecting odfpy
  Downloading odfpy-1.4.1.tar.gz (717 kB)
     ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 717.0/717.0 kB 8.9 k
B/s eta 0:00:00[36m0:00:02m eta 0:00:03
  Preparing metadata (setup.py) ... done
Requirement already satisfied: defusedxml in /snap/jupyter/6/lib/p
ython3.7/site-packages (from odfpy) (0.5.0)
Building wheels for collected packages: odfpy
  Building wheel for odfpy (setup.py) ... done
  Created wheel for odfpy: filename=odfpy-1.4.1-py2.py3-none-any.w
hl size=160692 sha256=ec6c7b36ec28dec706d5879f16e7eed0c8f147006bf5
41efc12b12cd2a155799
  Stored in directory: /home/malik-m-shahmeer-rashid/snap/jupyter/
6/.cache/pip/wheels/e2/f4/5d/a68c656235d33455a1d0f78e877acddfa0069
07a6d52d7e6ee
Successfully built odfpy
Installing collected packages: odfpy
Successfully installed odfpy-1.4.1
Note: you may need to restart the kernel to use updated packages.
```

Question#6: Write a Python program to create a pie chart of gold medal achievements of five most successful countries in 2016 Summer Olympics. Read the data from a csv file.

Sample data:

country,gold_medal

United States,46

Great Britain,27

China,26

Russia,19

Germany,17

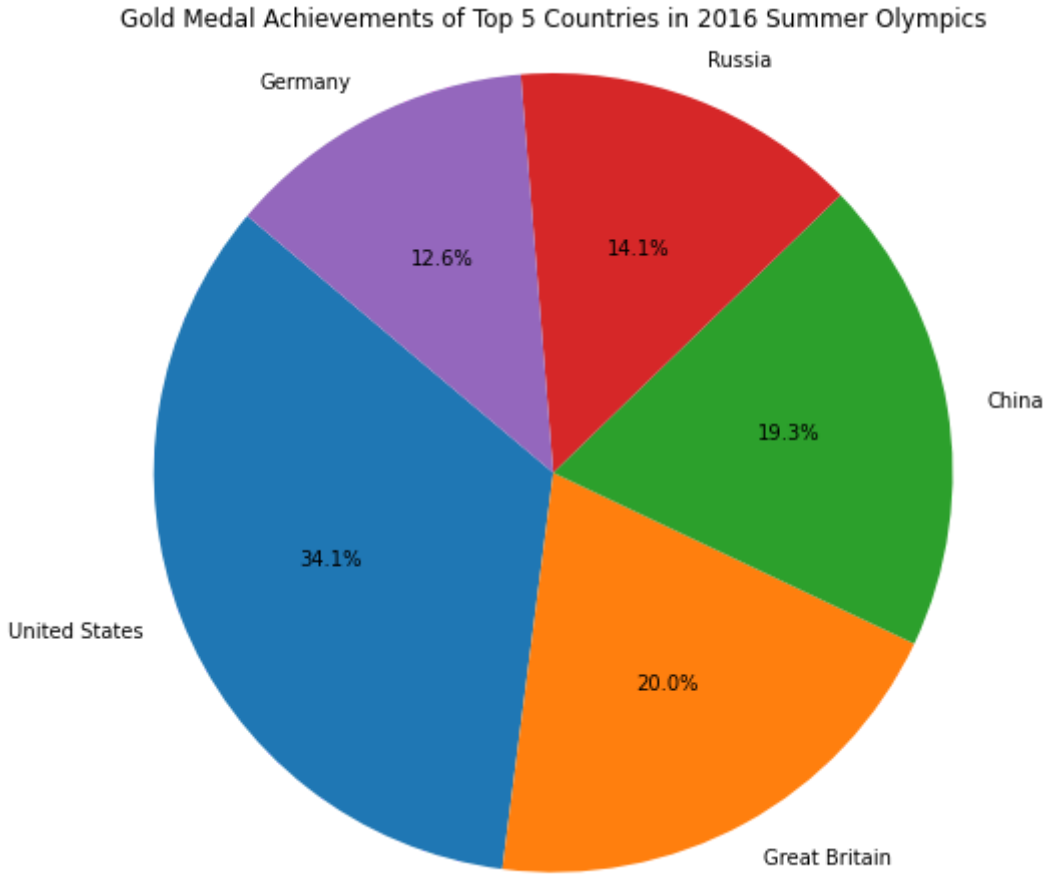
In [3]:
```
import pandas as pd

df = pd.read_excel('data.xlsx')

top_countries = df.nlargest(5, 'Gold Medal')

plt.figure(figsize=(8, 8))
plt.pie(top_countries['Gold Medal'], labels=top_countries['Country'
plt.title('Gold Medal Achievements of Top 5 Countries in 2016 Summe
plt.axis('equal')

plt.show()
```



Question#7: Write a Python program to draw a scatter plot comparing two subject marks of Mathematics and Science. Use marks of 10 students.

Sample data:

math_marks = [88, 92, 80, 89, 100, 80, 60, 100, 80, 34]

science_marks = [35, 79, 79, 48, 100, 88, 32, 45, 20, 30]

marks_range = [10, 20, 30, 40, 50, 60, 70, 80, 90, 100]

In [4]:
```
math_marks = [88, 92, 80, 89, 100, 80, 60, 100, 80, 34]
science_marks = [35, 79, 79, 48, 100, 88, 32, 45, 20, 30]
marks_range = [10, 20, 30, 40, 50, 60, 70, 80, 90, 100]

plt.scatter(marks_range, math_marks, label='Math Marks', color='red
plt.scatter(marks_range, science_marks, label='Science Marks', colo

plt.title('Mathematics vs Science Marks')
plt.xlabel('Marks Range')
plt.ylabel('Marks')
plt.legend()
plt.grid(True)

plt.show()
```