ПРОГРАММИРОВАНИЕ (БАҒДАРЛАМАЛАУ) 3-лекция

Лектор:

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Шартты оператор IF

```
if выражение:
    инструкция_1
    инструкция_2
    ...
    инструкция_n
```

Конструкция if – else

```
if выражение:
    инструкция_1
    инструкция_2
    …
    инструкция_n
else:
    инструкция_a
    инструкция_b
    …
    инструкция_x
```

Конструкция if – elif – else

```
if выражение_1:
    инструкции_(блок_1)
elif выражение_2:
    инструкции_(блок_2)
elif выражение_3:
    инструкции_(блок_3)
else:
    инструкции_(блок_4)
```

Example:

```
a = int(input("введите число:"))
if a < 0:
    print("Neg")
elif a == 0:
    print("Zero")
else:
    print("Pos")
```

Циклдік оператор WHILE

```
while выражение:
    инструкция_1
    инструкция_2
    ...
    инструкция_n
```

Examples:

```
a=0
while a < 7:
        print("A")
         a += 1
```

#Пример бесконечного цикла:

```
a=0
while a == 0:
         print("A")
```

break, continue операторлары

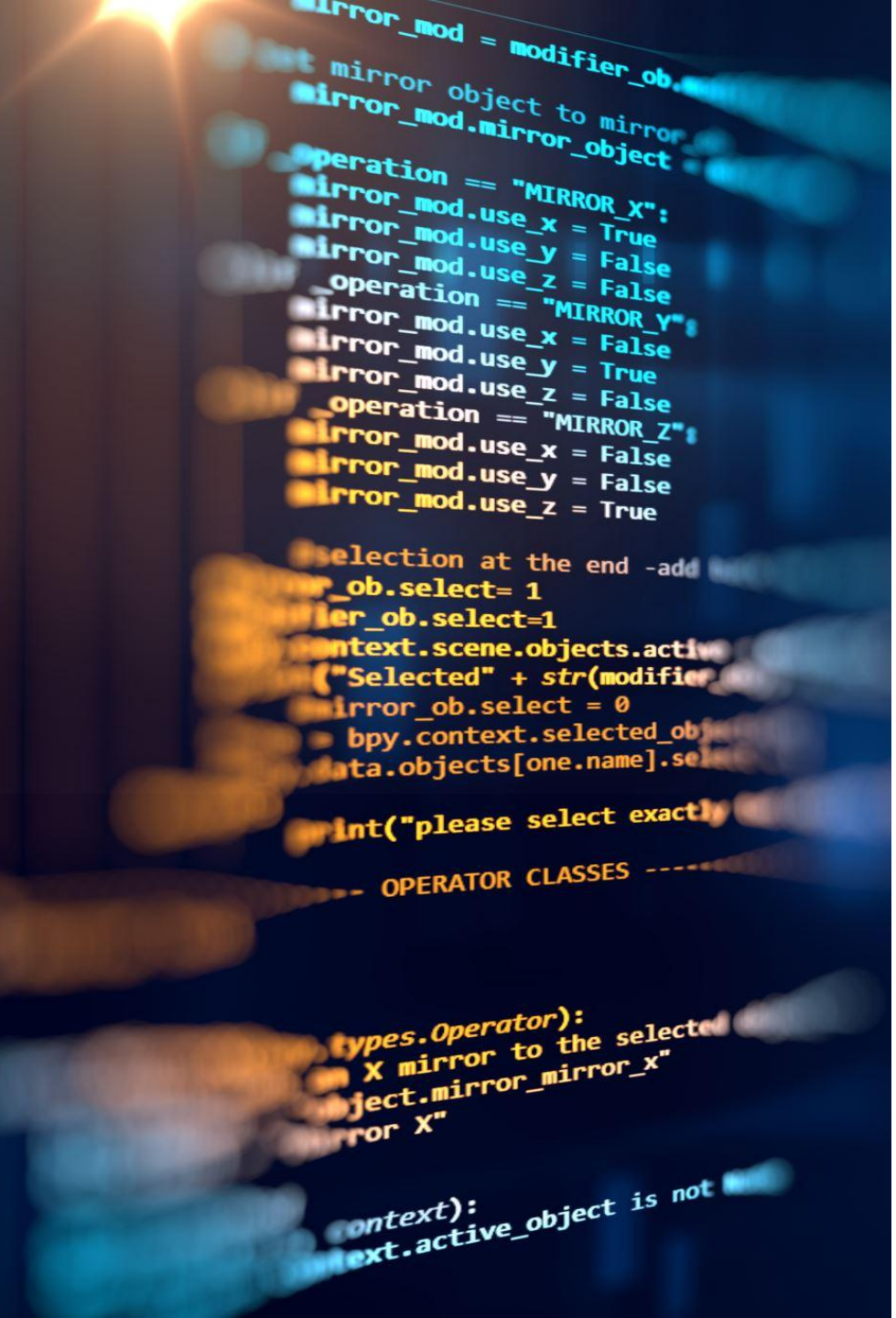
Циклдармен жұмыс кезінде циклдің жұмысын мерзімінен бұрын аяқтау үшін **break, continue** операторлары қолданылады:

```
a = -1
while a < 10:
    a =a+1
    if a>= 7:
      continue
    print("A")
```

Continue операторы циклды қайтадан қосады, бірақ программада осы операторданкейін орналасқан код орындалмайды. Берілген мысалдың нәтижесінде жеті рет «А» әріпі экранға шығады (цикл 11 мәрте қосылса да).

```
a=0
while a >= 0:
  if a == 7:
      break
  a += 1
  print("A")
```

break операторы **while** циклін мерзімінен бұрын тоқтату үшін қолданылады.



Python-да график салу **Matplotlib** кітапханасын енгізу арқылы жүзеге асады:

import matplotlib . pyplot as plt

График тұрғызу үшін келесі функциялар жиі қолданылады:

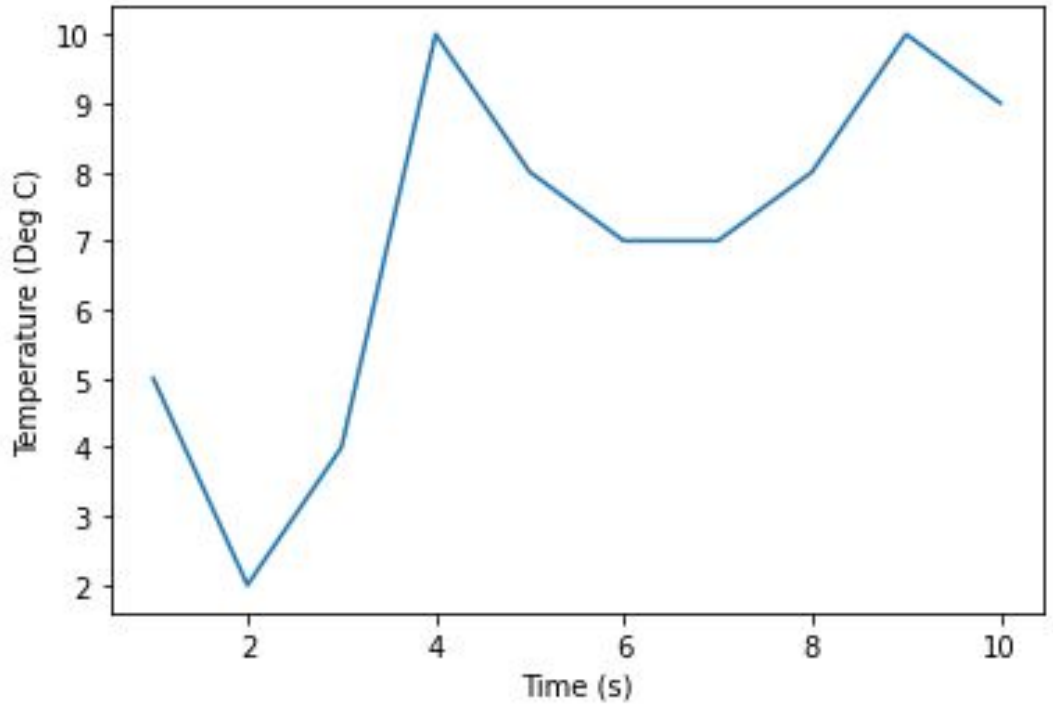
- plot()
- title()

xlabel()

- ylabel()
- axis()
- grid()
- subplot()
- legend()
- show()

Уақытқа байланысты температураның өлшемін графикалық кескіндеу программасы:

```
from matplotlib.pyplot import *
x=[1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
y=[5, 2, 4, 10, 8, 7, 7, 8, 10, 9]
plot(x,y)
xlabel("Time (s)")
ylabel("Temperature (Deg C)")
show()
```

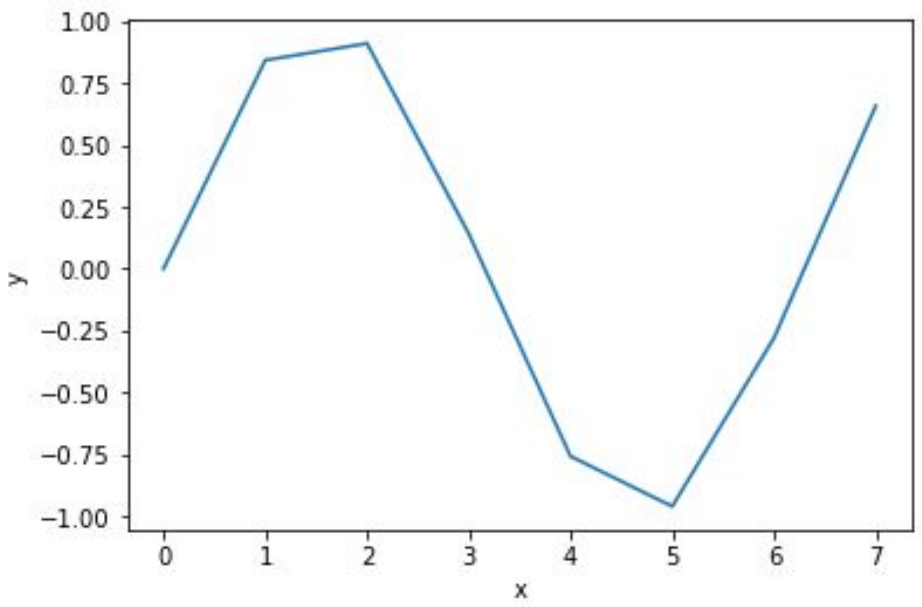


Алдыңғы программалық кодты келесі түрде де жаза аламыз:

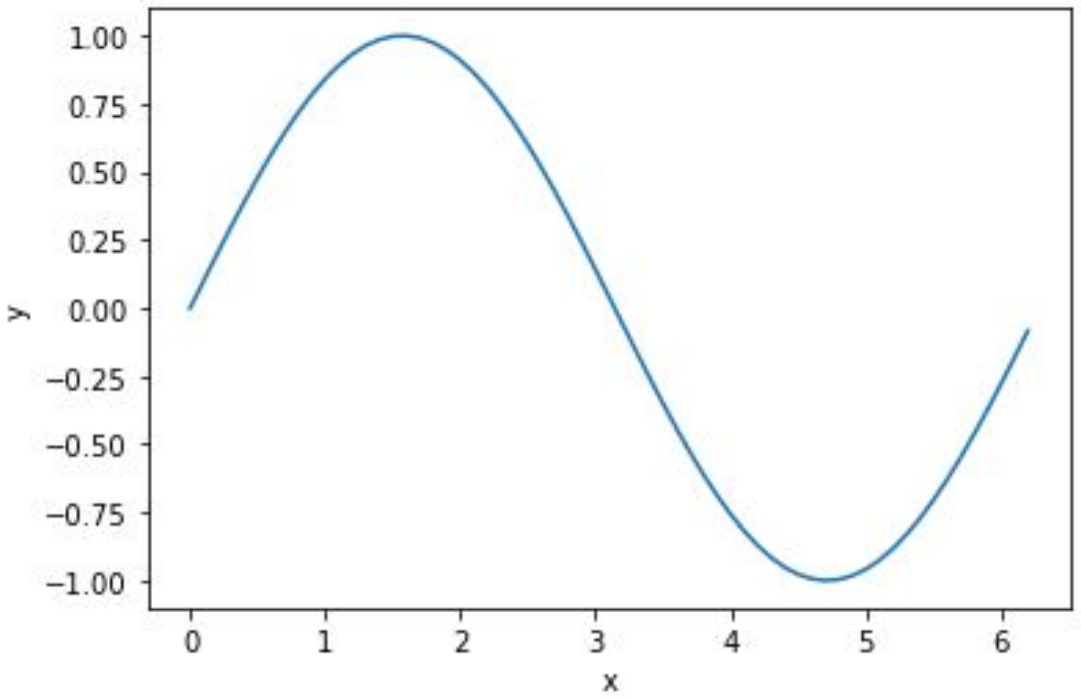
```
from matplotlib . pyplot import *
x = [1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
y = [5, 2,4, 4, 8, 7, 4, 8, 10, 9]
plot (x , y)
xlabel( “Time (s) “)
ylabel( “Temperature (degC) “)
show()
```

Sin(x) Функциясының графигін салу мысалы:

```
import numpy as np
import matplotlib . pyplot as plt
x=[0,1,2,3,4,5,6,7]
y = np.sin(x)
plt.plot(x, y)
plt.xlabel("x")
plt.ylabel("y")
plt .show()
```

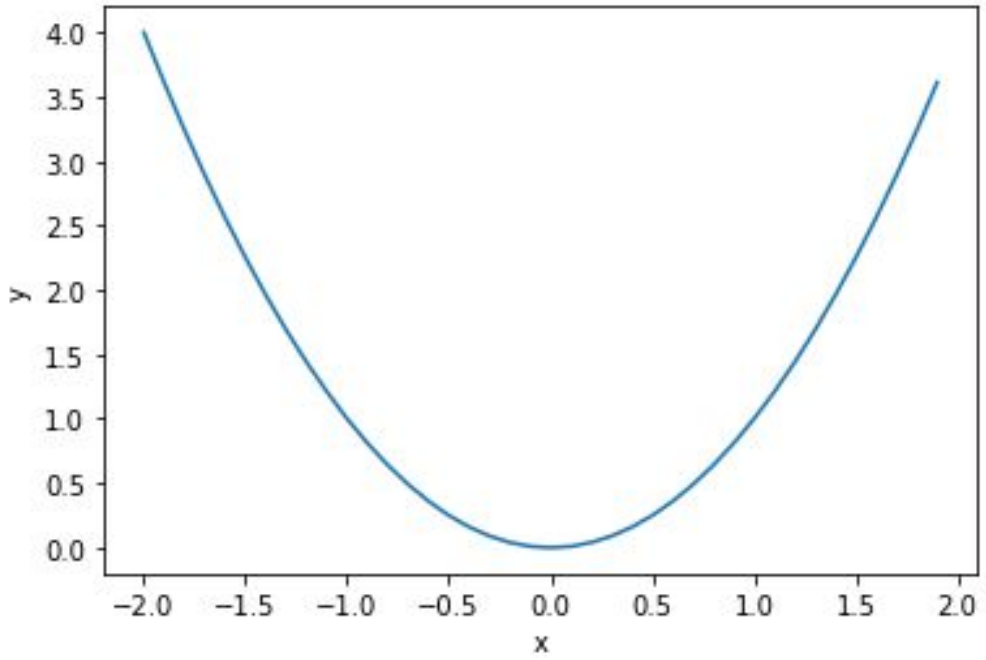


Алдыңғы кодқа өзгертулер енгізіп, функцияның графигін келесі түрде аламыз:



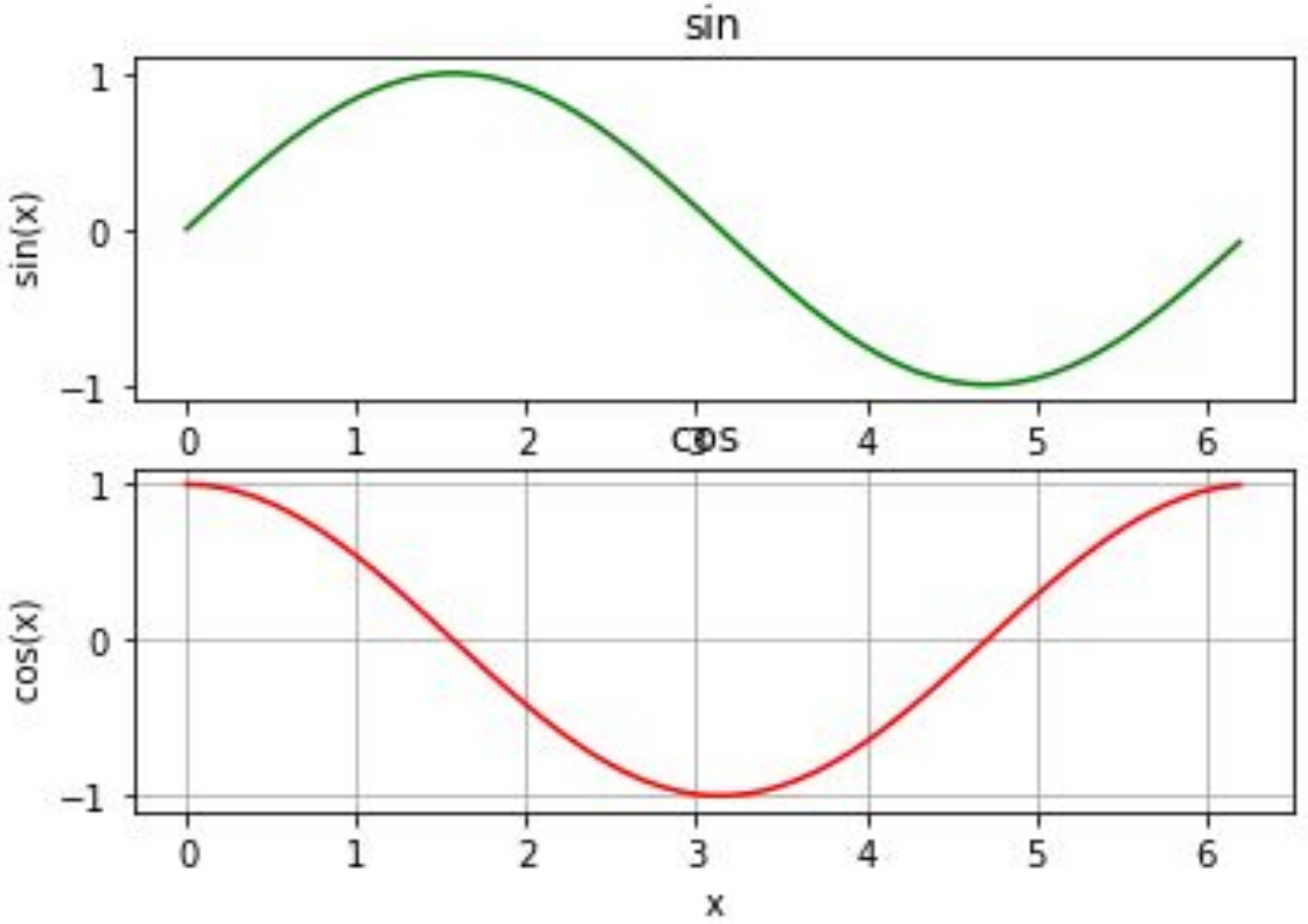

```
import matplotlib . pyplot as plt
import numpy as np
xstart = 0
xstop = 2*np.pi
increment = 0.1
x = np . arange ( xstart , xstop , increment )
y = np.sin(x)
plt.plot(x, y)
plt.xlabel("x")
plt.ylabel("y")
plt .show()
```

```
import matplotlib . pyplot as plt
import numpy as np
xstart = -2
xstop = 2
increment = 0.1
x = np . arange ( xstart , xstop ,
increment )
y = pow(x,2)
plt.plot(x, y)
plt.xlabel("x")
plt.ylabel("y")
plt .show()
```



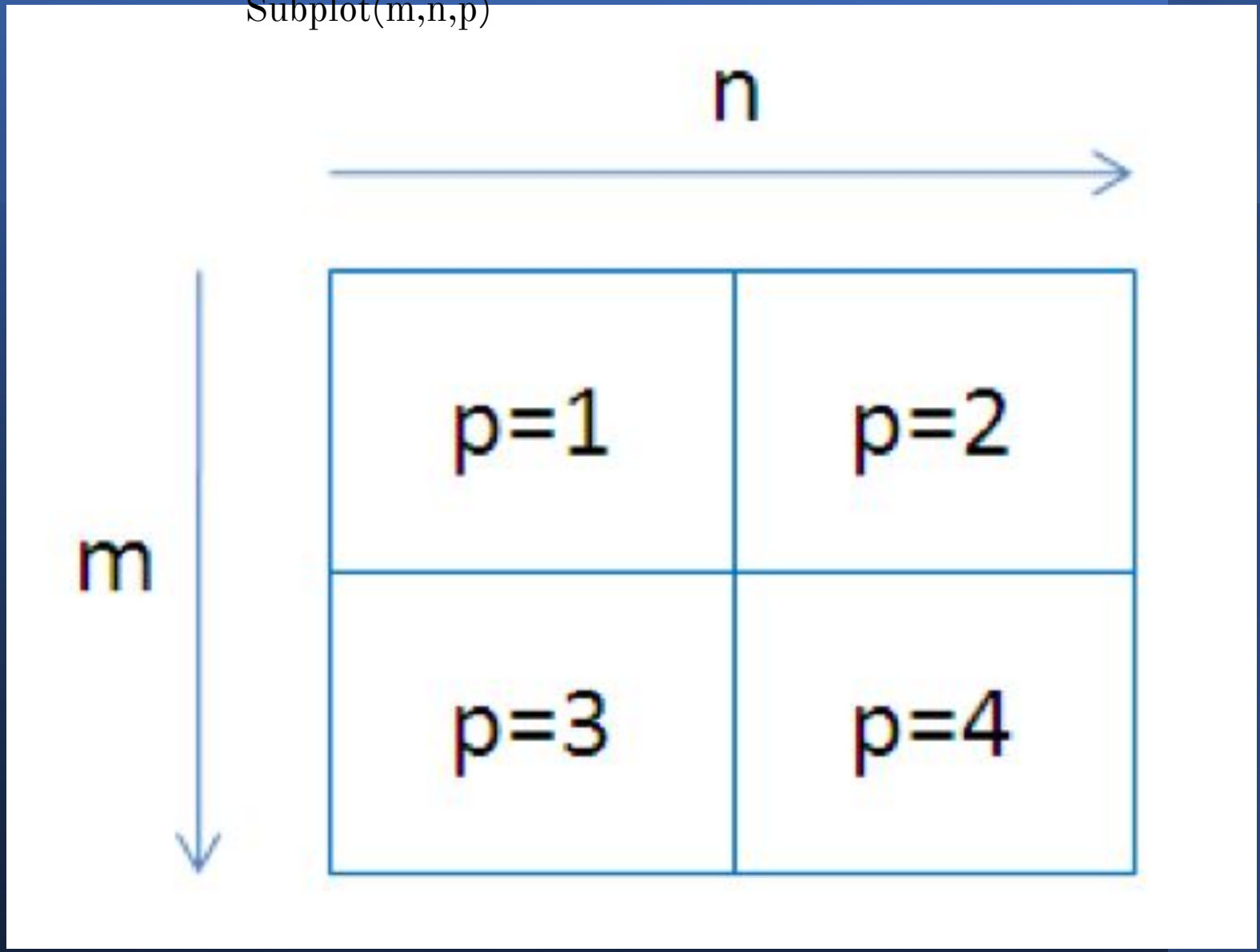
```
import matplotlib . pyplot as plt
import numpy as np
xstart = 0
xstop = 2*np.pi
increment = 0.1
x = np . arange ( xstart , xstop , increment )
y = np.sin(x)
z = np.cos(x)

plt . subplot (2 ,1 ,1)
plt.plot(x, y, "g")
plt.title("sin")
plt.xlabel("x")
plt . ylabel( "sin(x) ")


plt . subplot (2 ,1 ,2)
plt.plot(x, z, "r")
plt . title ( "cos ")
plt.xlabel("x")
plt . ylabel( "cos(x) ")
plt . grid ()
plt .show()
```

subplots

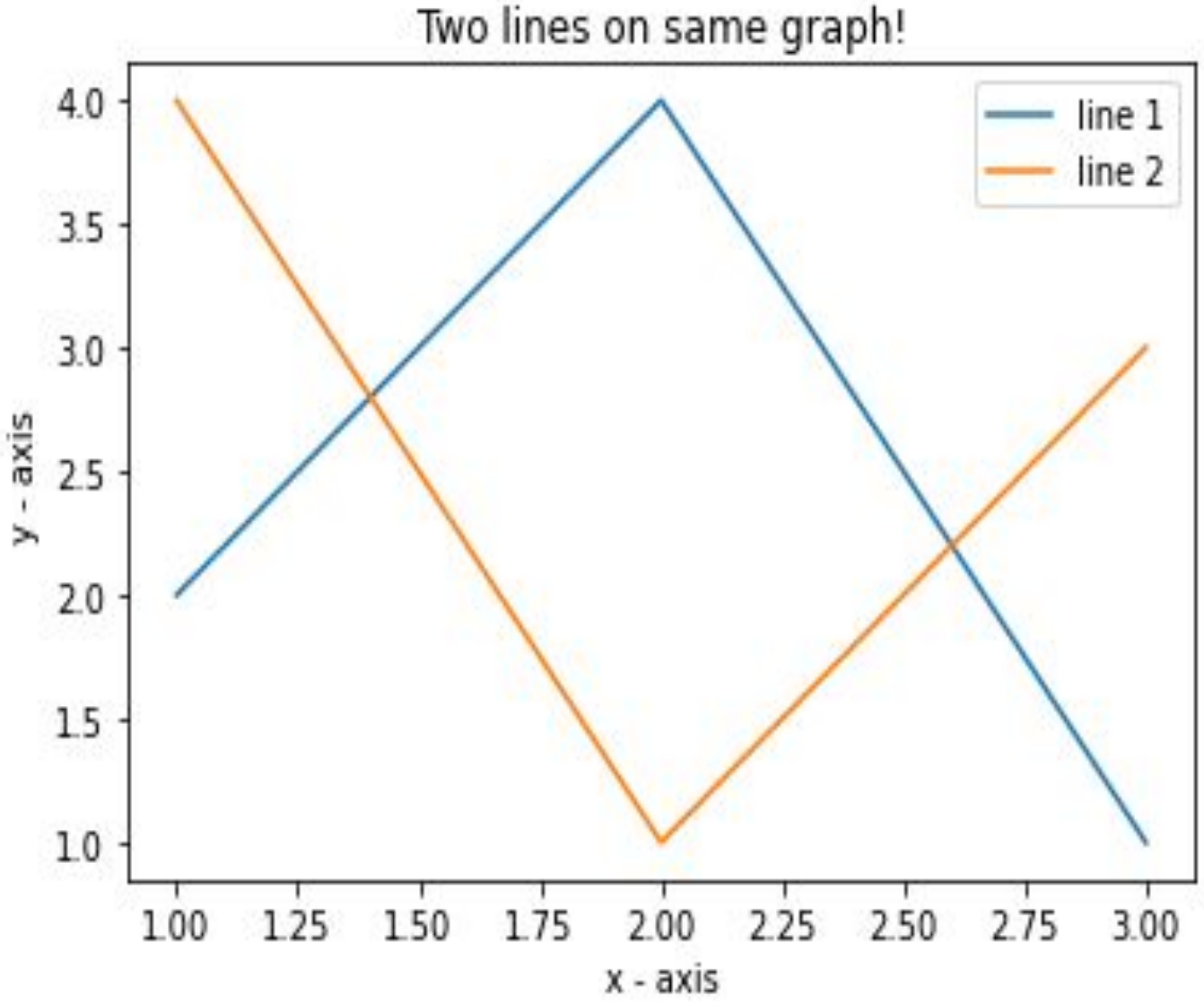


Creating Subplots in Python

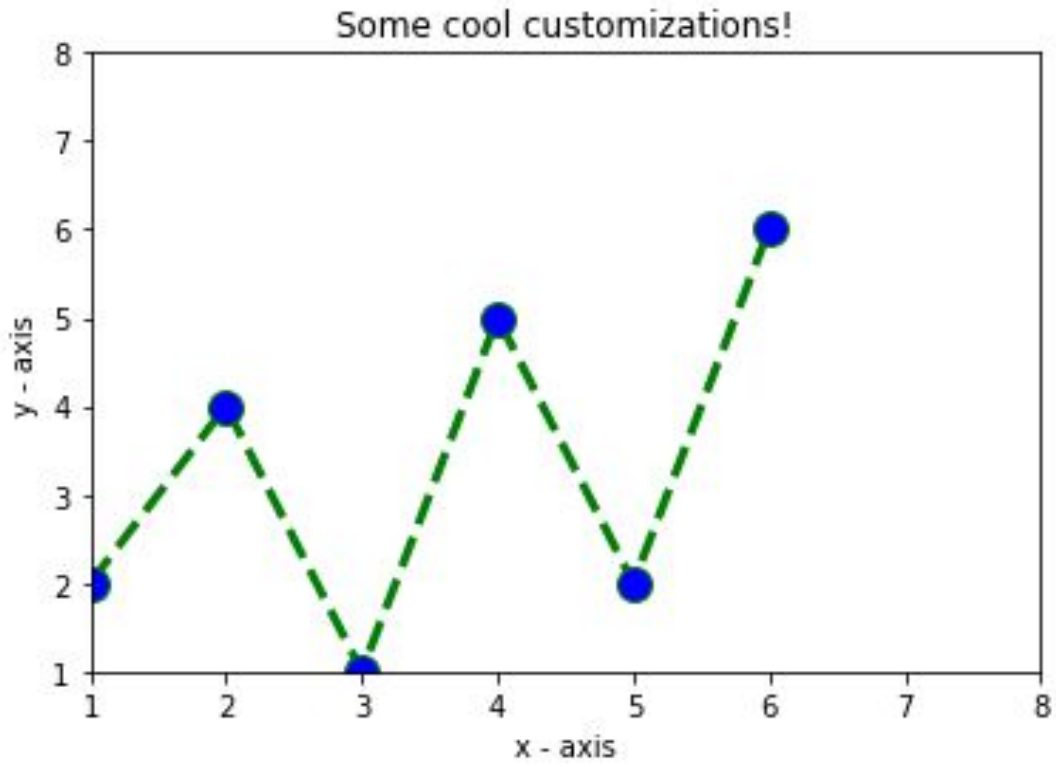
Subplot(m,n,p)



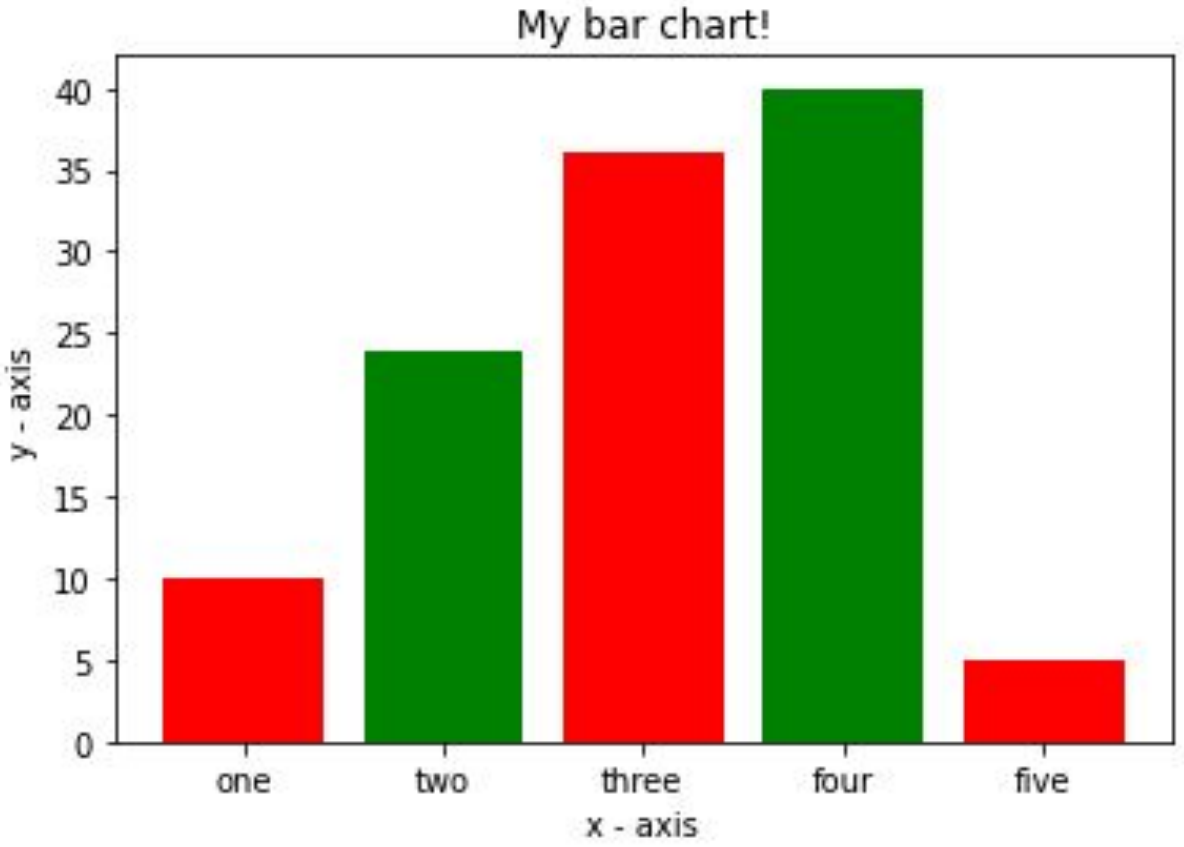
```
import matplotlib.pyplot as plt
# line 1 points
x1 = [1,2,3]
y1 = [2,4,1]
# plotting the line 1 points
plt.plot(x1, y1, label = "line 1")

# line 2 points
x2 = [1,2,3]
y2 = [4,1,3]
# plotting the line 2 points
plt.plot(x2, y2, label = "line 2")

# naming the x axis
plt.xlabel('x - axis')
# naming the y axis
plt.ylabel('y - axis')
# giving a title to my graph
plt.title('Two lines on same graph!')

# show a legend on the plot
plt.legend()

# function to show the plot
plt.show()
```



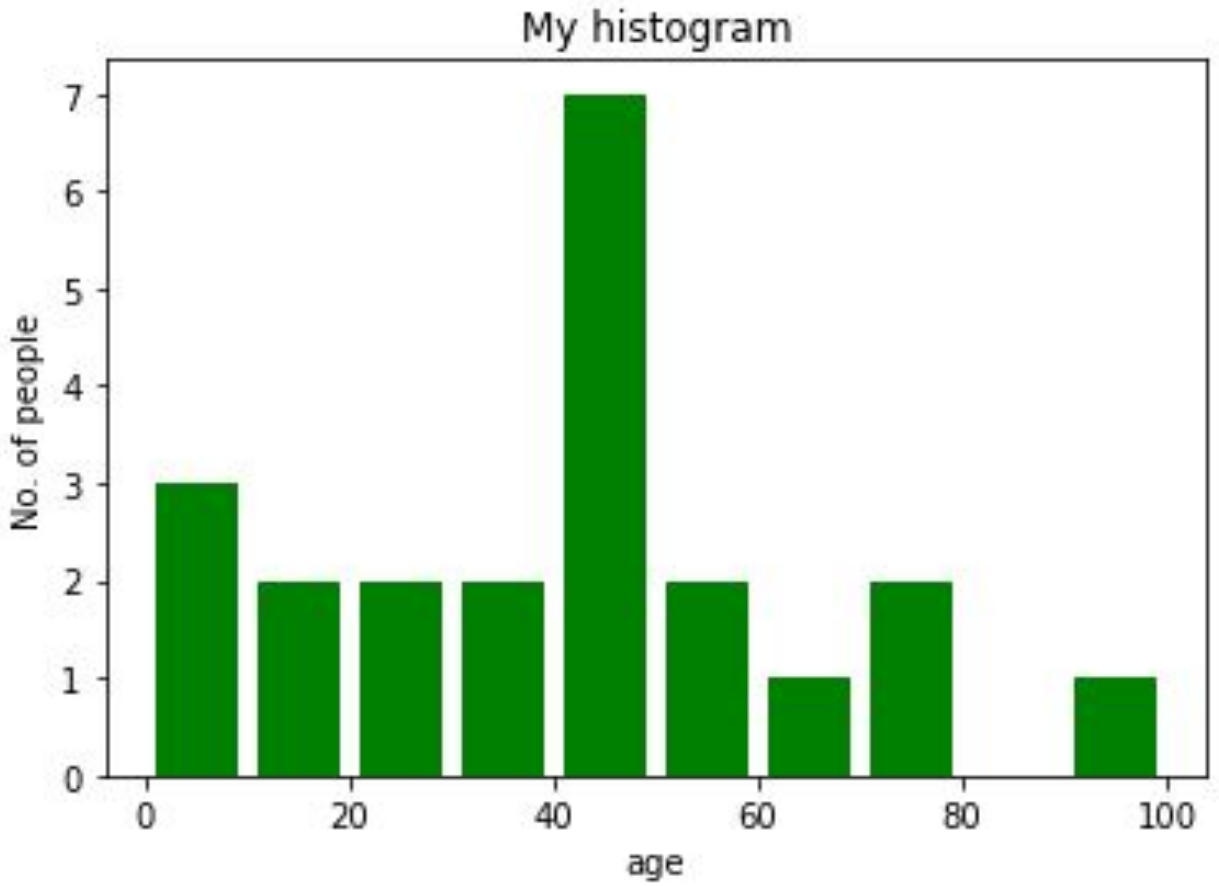
```
import matplotlib.pyplot as plt
 # x axis values
x = [1,2,3,4,5,6]
# corresponding y axis values
y = [2,4,1,5,2,6]

# plotting the points
plt.plot(x, y, color='green', linestyle='dashed', linewidth = 3,
        marker='o', markerfacecolor='blue', markersize=12)

# setting x and y axis range
plt.ylim(1,8)
plt.xlim(1,8)

# naming the x axis
plt.xlabel('x - axis')
# naming the y axis
plt.ylabel('y - axis')

# giving a title to my graph
plt.title('Some cool customizations!')

# function to show the plot
plt.show()
```



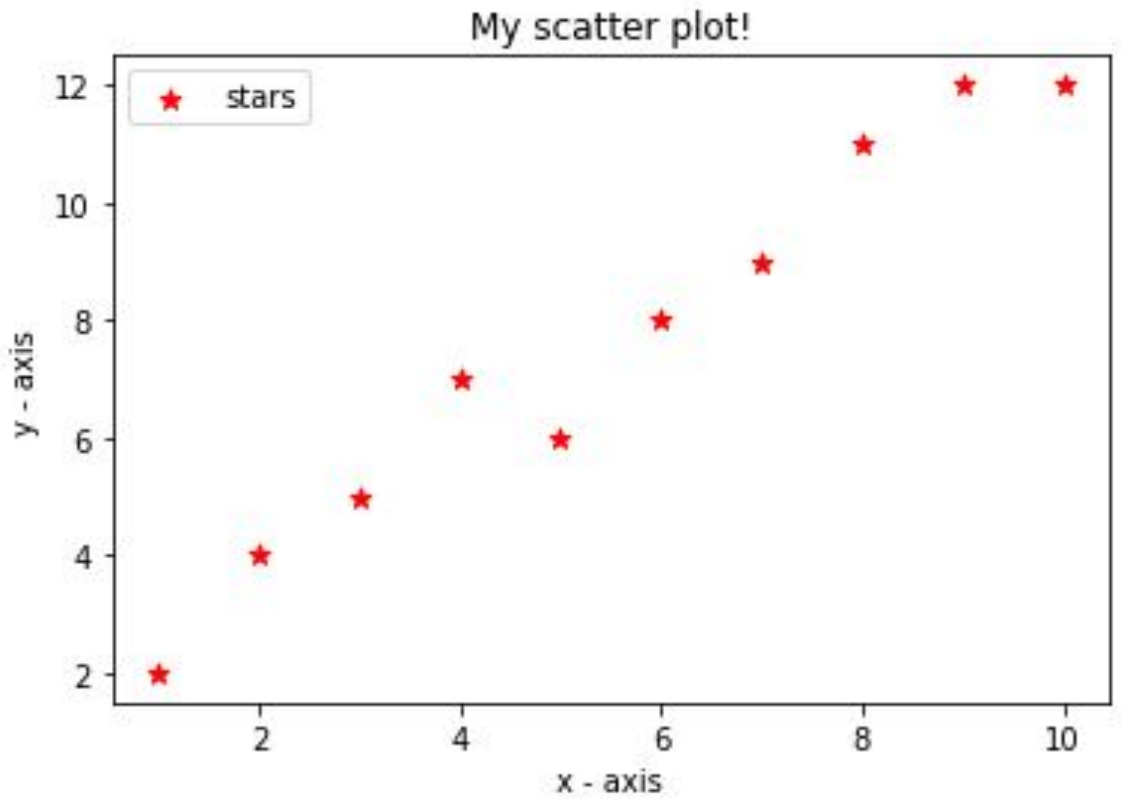
```
import matplotlib.pyplot as plt

# x-coordinates of left sides of bars
left = [1, 2, 3, 4, 5]

# heights of bars
height = [10, 24, 36, 40, 5]

# labels for bars
tick_label = ['one', 'two', 'three', 'four', 'five']

# plotting a bar chart
plt.bar(left, height, tick_label = tick_label,
        width = 0.8, color = ['red', 'green'])

# naming the x-axis
plt.xlabel('x - axis')
# naming the y-axis
plt.ylabel('y - axis')
# plot title
plt.title('My bar chart!')

# function to show the plot
plt.show()
```



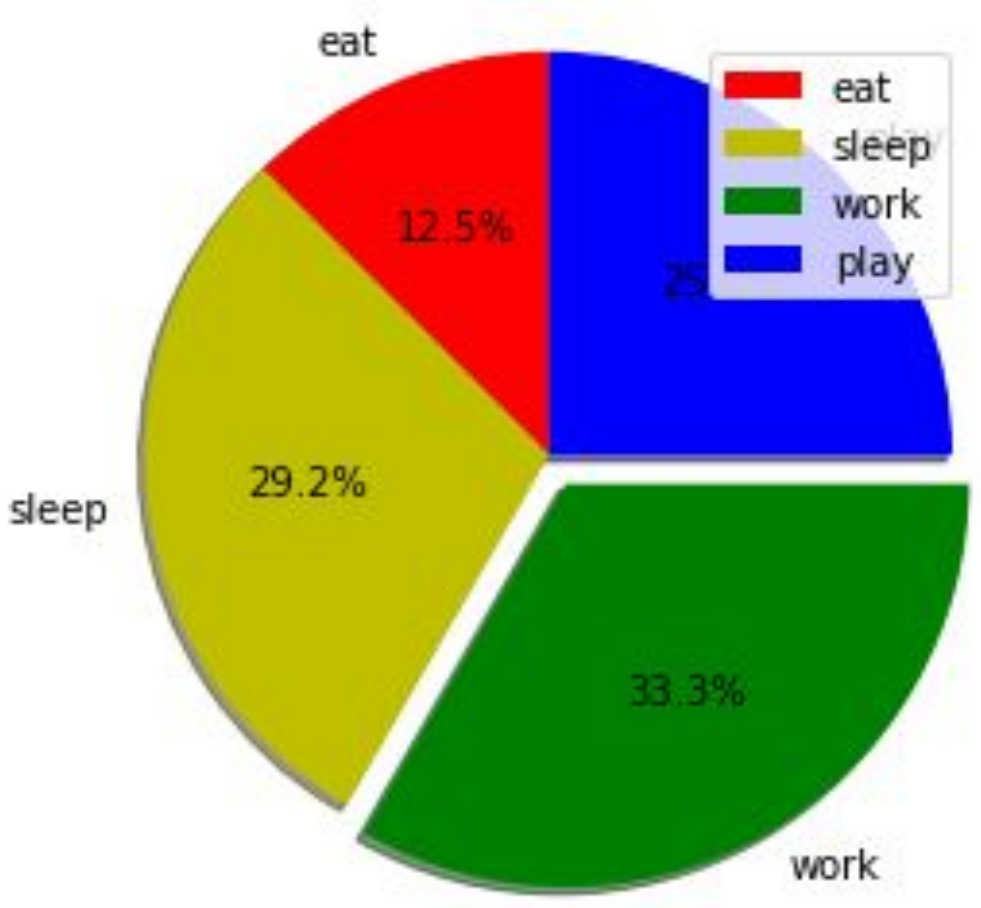
```
import matplotlib.pyplot as plt

# frequencies
ages = [2,5,70,40,30,45,50,45,43,40,44,
       60,7,13,57,18,90,77,32,21,20,40]

# setting the ranges and no. of intervals
range = (0, 100)
bins = 10

# plotting a histogram
plt.hist(ages, bins, range, color = 'green',
       histtype = 'bar', rwidth = 0.8)

# x-axis label
plt.xlabel('age')
# frequency label
plt.ylabel('No. of people')
# plot title
plt.title('My histogram')

# function to show the plot
plt.show()
```



```
import matplotlib.pyplot as plt

# x-axis values
x = [1,2,3,4,5,6,7,8,9,10]
# y-axis values
y = [2,4,5,7,6,8,9,11,12,12]

# plotting points as a scatter plot
plt.scatter(x, y, label= "stars", color= "red",
            marker= "*", s=50)

# x-axis label
plt.xlabel('x - axis')
# frequency label
plt.ylabel('y - axis')
# plot title
plt.title('My scatter plot!')
# showing legend
plt.legend()

# function to show the plot
plt.show()
```



```
import matplotlib.pyplot as plt

# defining labels
activities = ['eat', 'sleep', 'work', 'play']

# portion covered by each label
slices = [3, 7, 8, 6]

# color for each label
colors = ['r', 'y', 'g', 'b']

# plotting the pie chart
plt.pie(slices, labels = activities, colors=colors,
        startangle=90, shadow = True, explode = (0, 0, 0.1, 0),
        radius = 1.2, autopct = '%1.1f%%')

# plotting legend
plt.legend()

# showing the plot
plt.show()
```



Назарларыңызға рахмет!