

# project1\_\_2016-19516\_\_

May 1, 2020

## 1 Project 1. HMM

### 1.1 Hidden Markov Model

- - <https://ratsgo.github.io/machine%20learning/2017/10/14/computeHMMs/>
- <https://web.stanford.edu/~jurafsky/slp3/A.pdf>

### 1.2 Character Trajectories Data Set

- Import mat-formatted data
  - `mixoutALL_shifted.mat`
- Data Features
  - Data Set Characteristics: Time-Series
  - Number of Instances: 2858
  - Attribute Characteristics: Real
  - Number of Attributes: 3
  - Missing Values? N/A
  - Each character sample is a 3-dimensional pen tip velocity trajectory. This is contained in matrix format, with 3 rows and T columns where T is the length of the character sample.
  - 3 Dimensions were kept - x, y, and pen tip force.
  - <http://archive.ics.uci.edu/ml/datasets/Character+Trajectories>

```
[1]: from scipy import io
import matplotlib.pyplot as plt
import numpy as np

mat_file = io.loadmat('./Data/mixoutALL_shifted.mat')

# print(mat_file['consts'].dtype)
consts = mat_file['consts'][0,0]
mixouts = mat_file['mixout'][0]

keys = np.squeeze(consts['key'][0])
charlabels = consts['charlabels'][0] - 1
```

```

num_keys = keys.size
num_mixouts = mixouts.shape[0]
T = 0

print('num_mixouts:', num_mixouts)
print('num_keys:', num_keys)
for i in range(num_keys):
    print(keys[i], end='')

for i in range(num_mixouts):
    mixouts[i] = mixouts[i].T
    mask = (mixouts[i][:,0] != 0) | (mixouts[i][:,1] != 0)
    mixouts[i] = mixouts[i][mask]
    T = max(T, mixouts[i].shape[0])

```

```

num_mixouts: 2858
num_keys: 20
['a']['b']['c']['d']['e']['g']['h']['l']['m']['n']['o']['p']['q']['r']['s']['u']
['v']['w']['y']['z']

```

```

[2]: def plot_disp(displacement, time):
    plt.scatter(displacement[:time//3,0], displacement[:time//3,1], color='blue')
    plt.scatter(displacement[time//3:time*2//3,0], displacement[time//3:time*2//3,1],
    ↪color='green')
    plt.scatter(displacement[time*2//3:,0], displacement[time*2//3:,1], color='red')
    # plt.show()

def plot_vel_acc(velocity, acceleration, time):
    plt.subplot('121')
    plt.scatter(velocity[:time//3,0], velocity[:time//3,1], color='blue')
    plt.scatter(velocity[time//3:time*2//3,0], velocity[time//3:time*2//3,1],
    ↪color='green')
    plt.scatter(velocity[time*2//3:,0], velocity[time*2//3:,1], color='red')
    plt.subplot('122')
    plt.scatter(acceleration[:time//3,0], acceleration[:time//3,1], color='blue')
    plt.scatter(acceleration[time//3:time*2//3,0], acceleration[time//3:time*2//3,1],
    ↪color='green')
    plt.scatter(acceleration[time*2//3:,0], acceleration[time*2//3:,1], color='red')
    plt.show()

def plot_acc_angle(acceleration_angle, time):
    plt.plot(range(0,time//3),acceleration_angle[:time//3], color='blue')
    plt.plot(range(time//3,time*2//3),acceleration_angle[time//3:time*2//3],
    ↪color='green')
    plt.plot(range(time*2//3,time),acceleration_angle[time*2//3:], color='red')
    plt.show()

```

```

def plot_obs(obs, time):
    plt.plot(range(0,time//3),obs[:time//3], color='blue')
    plt.plot(range(time//3,time*2//3),obs[time//3:time*2//3], color='green')
    plt.plot(range(time*2//3,time),obs[time*2//3:], color='red')
    plt.show()

```

```

[4]: def get_observation(displacement):
    time = displacement.shape[0]
    vel = np.zeros((time, 2))
    acc = np.zeros((time, 2))

    vel_angle = np.zeros(time)
    angle = np.zeros(time)
    obs = np.zeros(time, dtype=int)
    for i in range(1, time):
        vel[i] = displacement[i] - displacement[i-1]
        acc[i] = vel[i] - vel[i-1]
        vel_angle[i] = np.arctan2(vel[i][0], vel[i][1])
        if vel_angle[i] < 0:
            vel_angle[i] += 2 * np.pi
        angle[i] = np.arctan2(acc[i][0], acc[i][1])
        if angle[i] < 0:
            angle[i] += 2 * np.pi
        obs[i] = int((angle[i] / np.pi * 3) % 6) + int((vel_angle[i] / np.pi * 2) % 4) * 6
    return (time, vel, acc, angle, obs)

num_features = 24
features = np.empty(num_mixouts, dtype=object)
prev = None
for i in range(0, num_mixouts, 1):
    displacement = mixouts[i][:,:2]
    (time, vel, acc, angle, obs) = get_observation(displacement)
    features[i] = obs

    if prev != charlabels[i]:
        print(i, keys[charlabels[i]])
        prev = charlabels[i]
        displacement = mixouts[i][:,:2]

    plt.subplot('121')
    plot_disp(displacement, time)

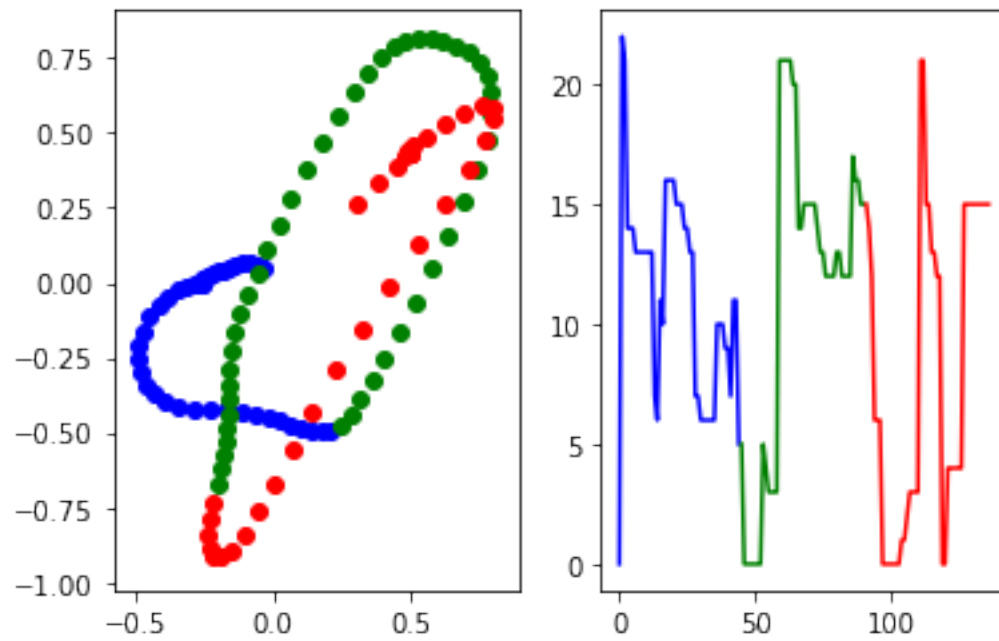
    plt.subplot('122')
    plot_obs(obs, time)

#         plot_vel_acc(vel, acc, time)

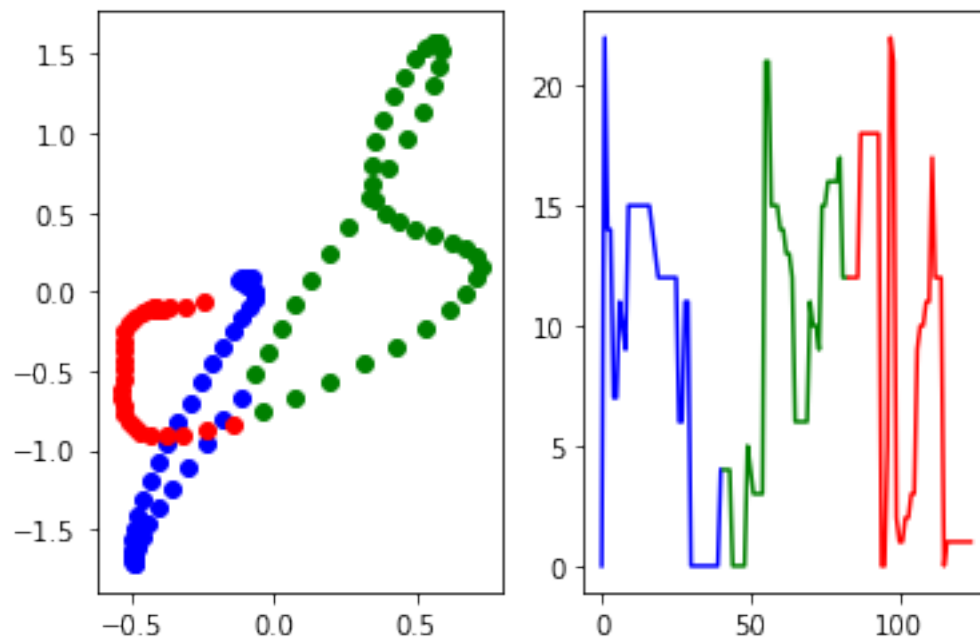
```

```
# plot_acc_angle(angle, time)
```

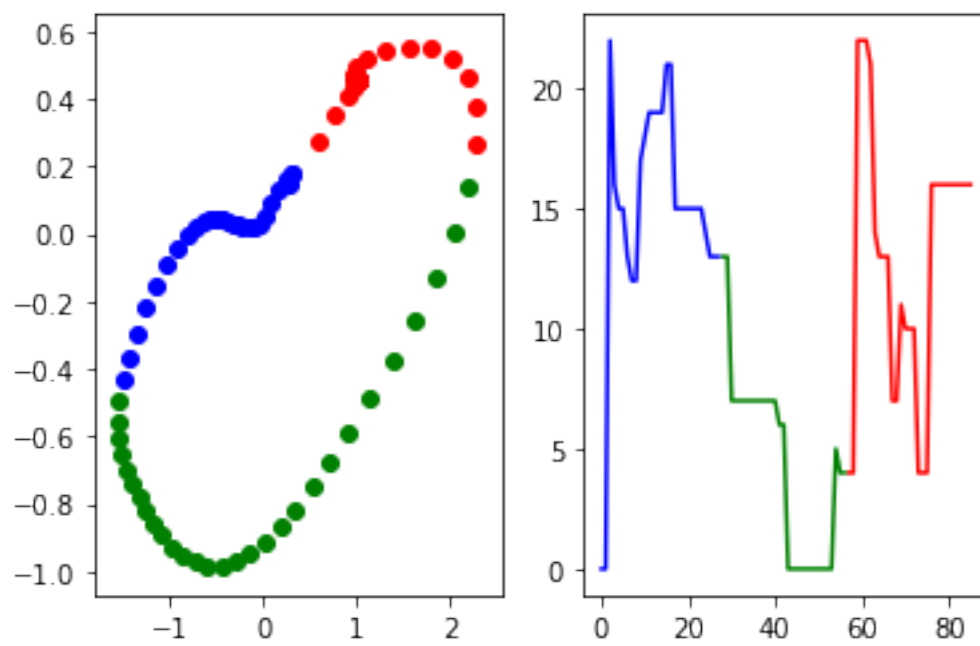
0 ['a']



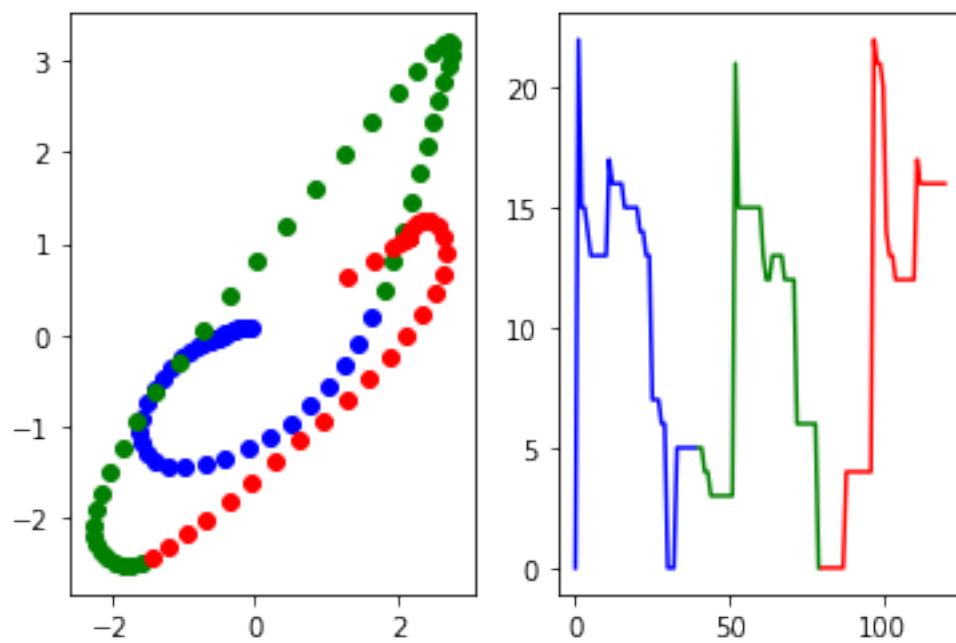
97 ['b']



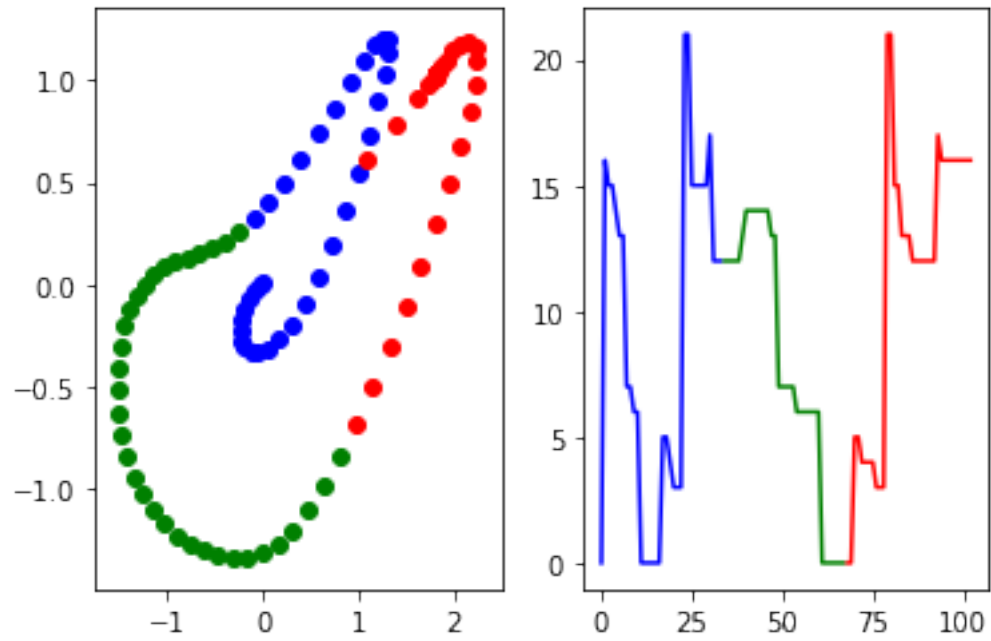
170 ['c']



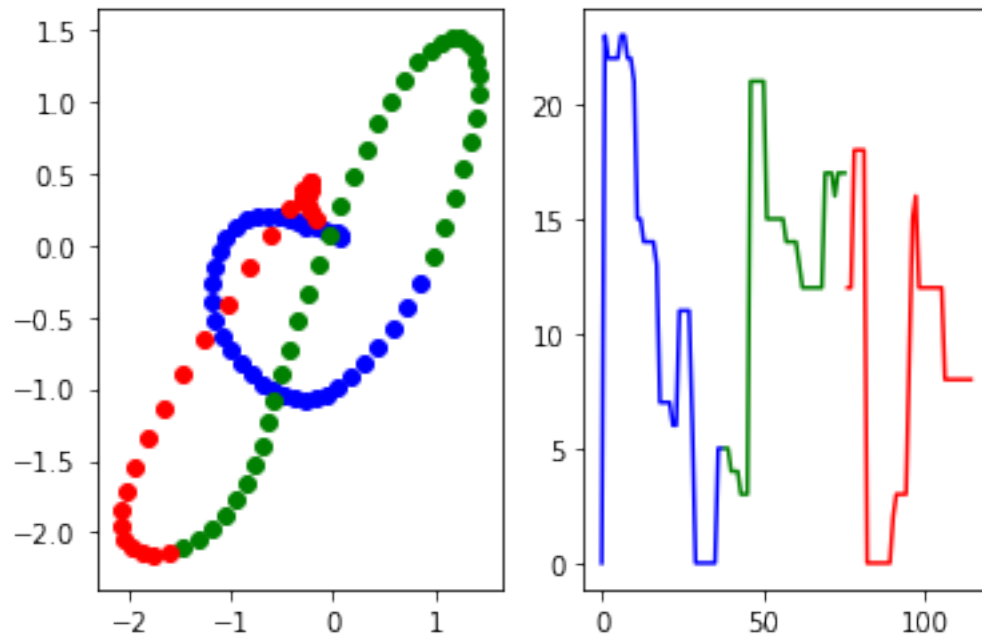
225 ['d']



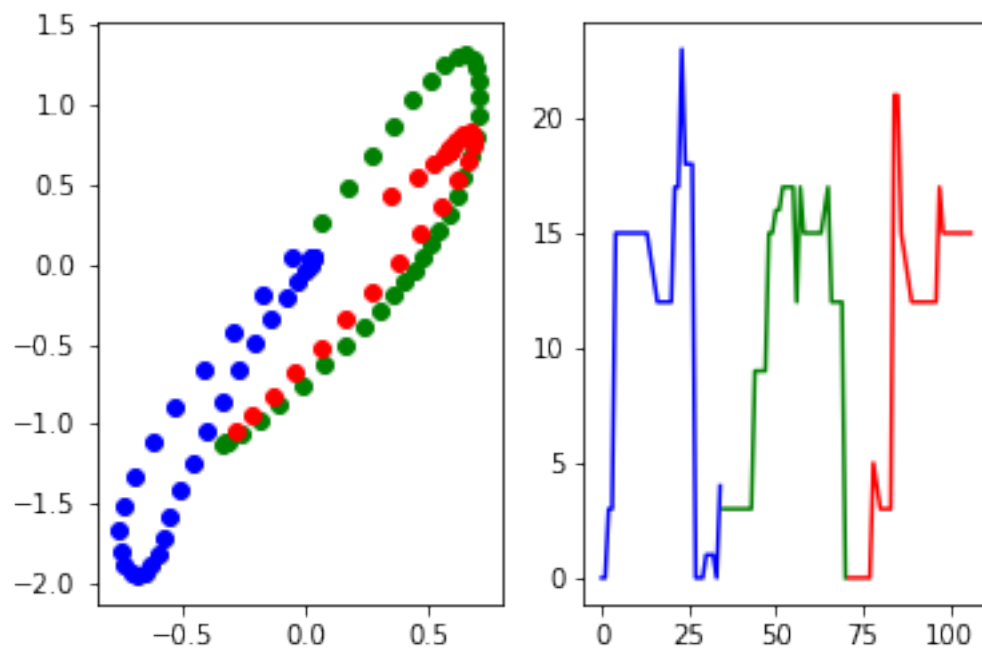
307 ['e']



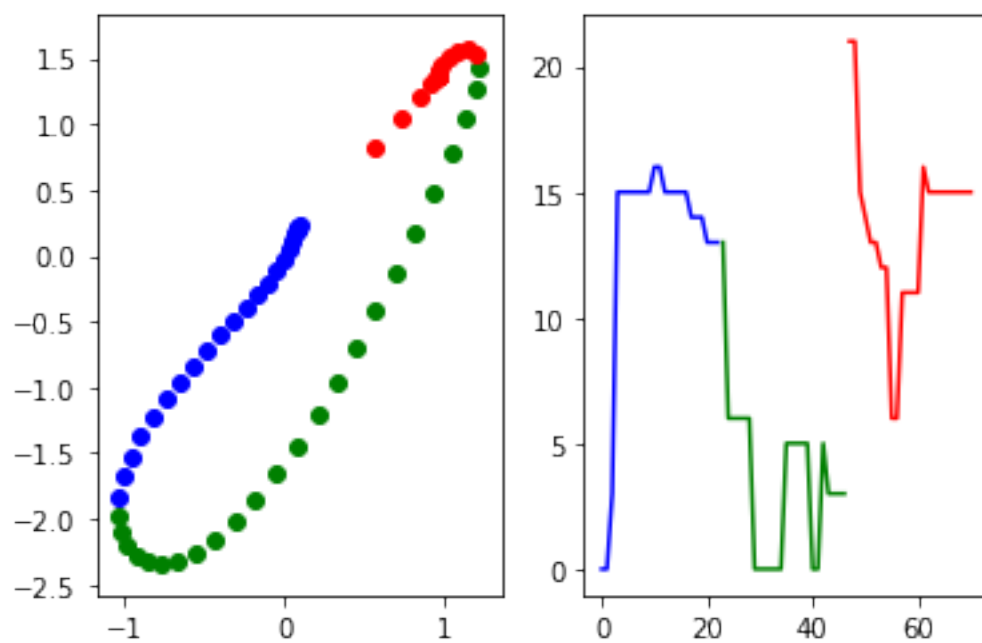
420 ['g']



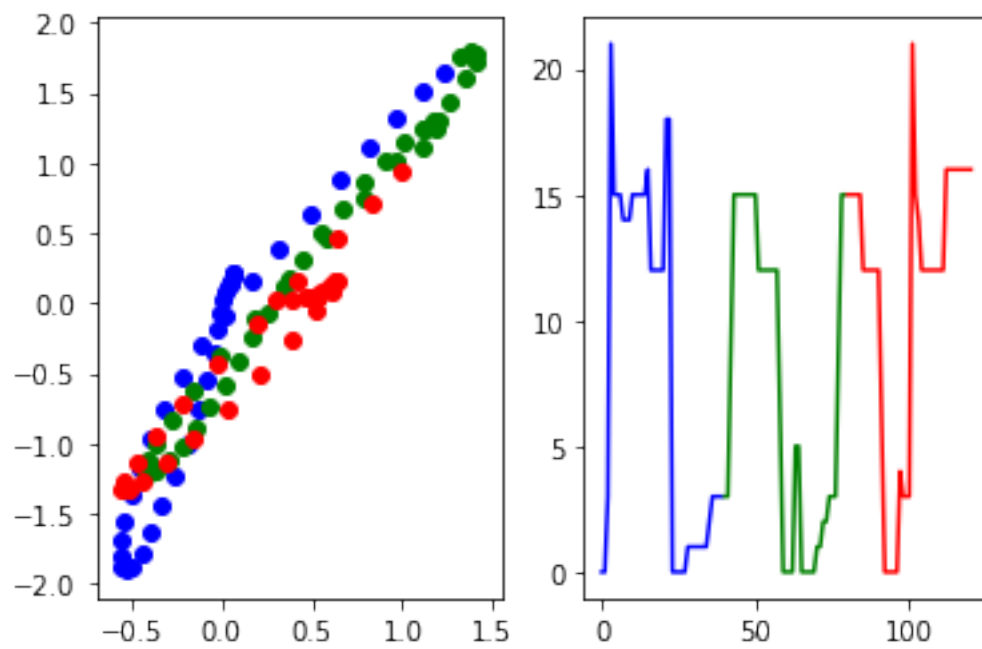
486 ['h']



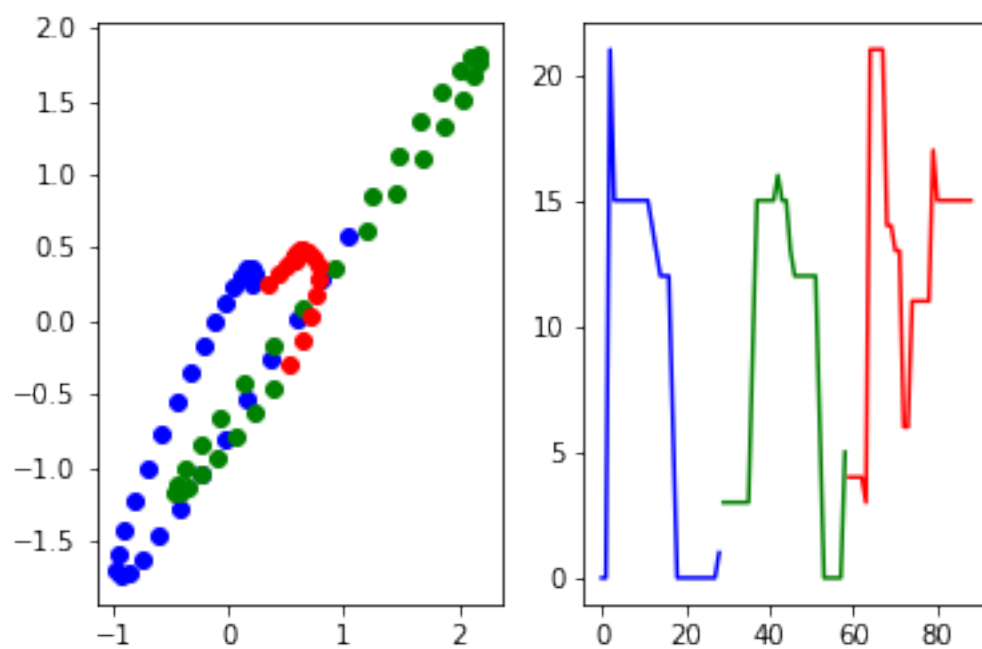
543 ['1']



623 ['m']

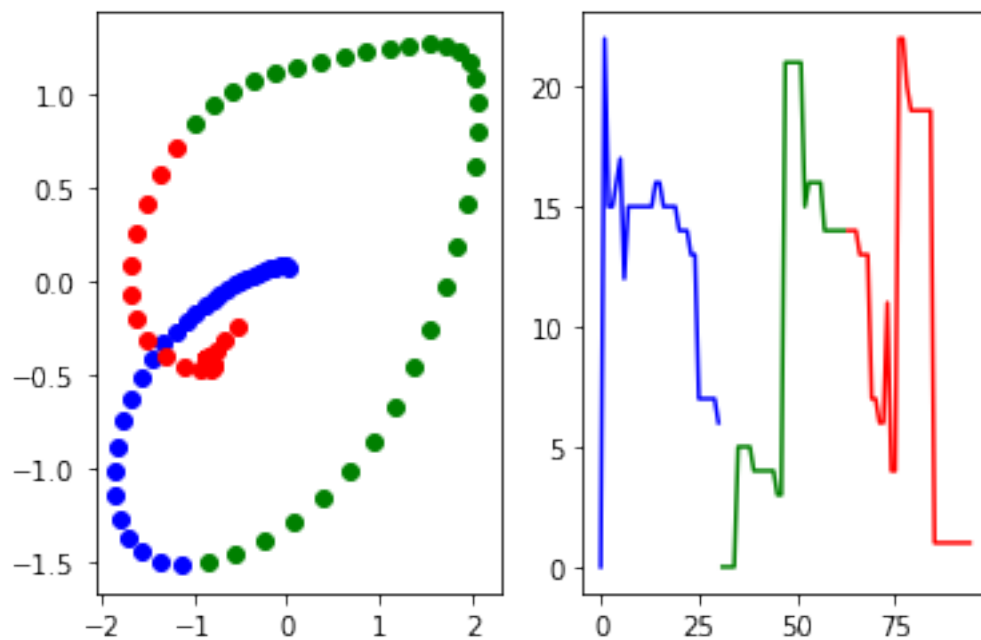


692 ['n']

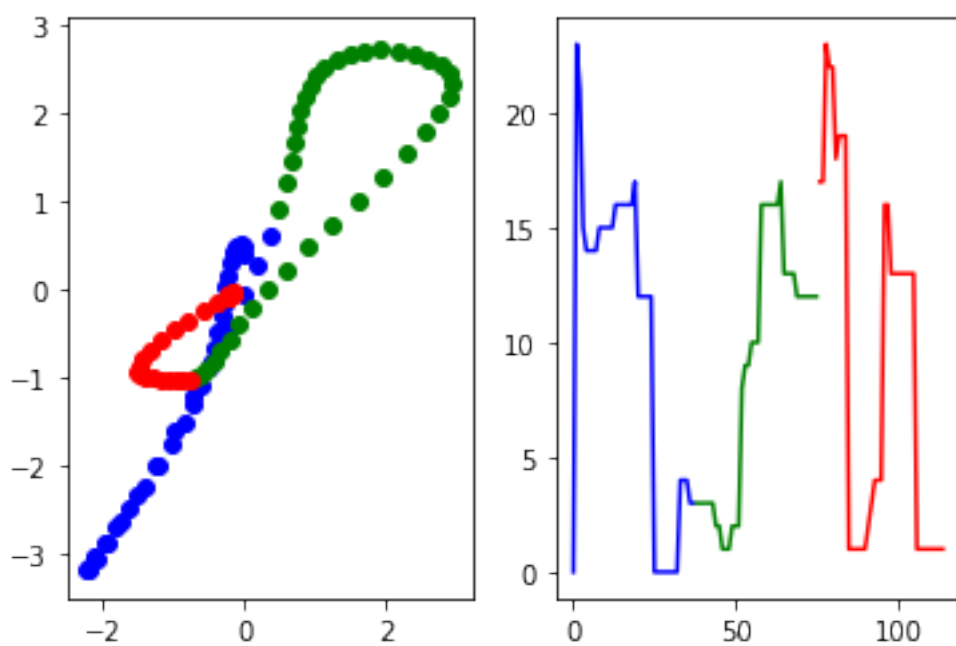


748 ['o']

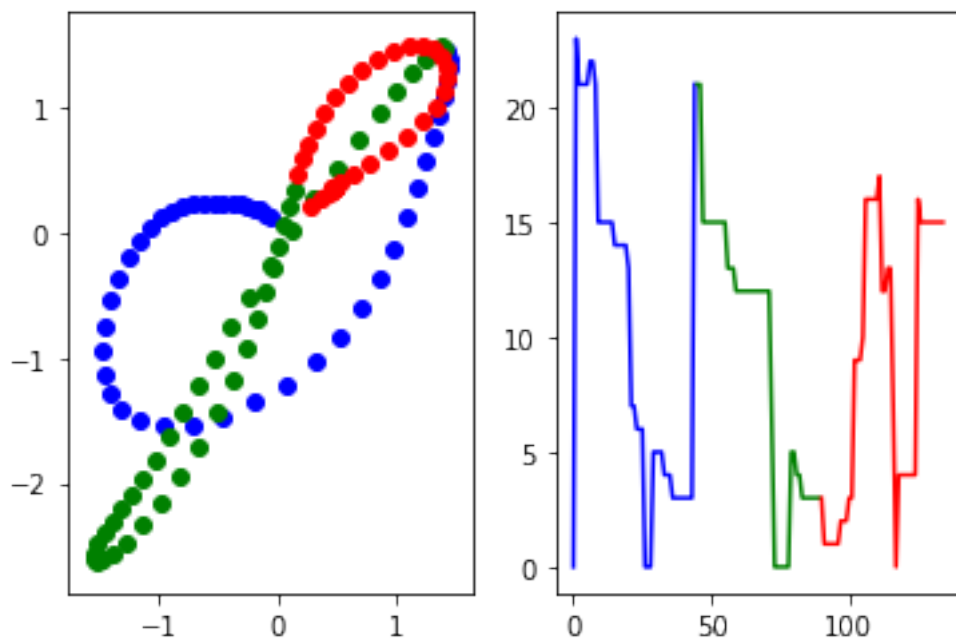




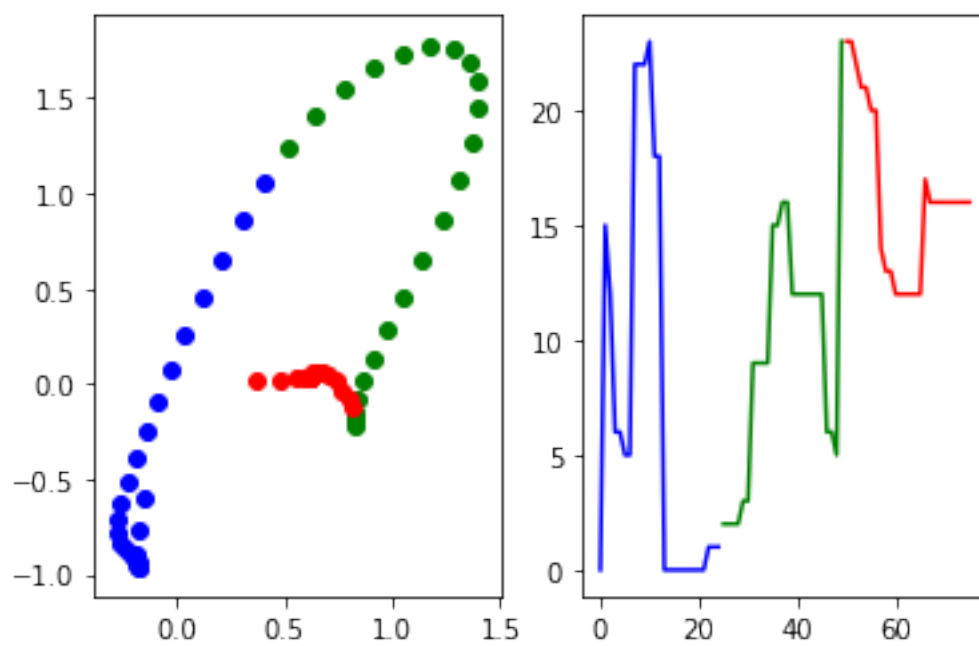
816 ['p']



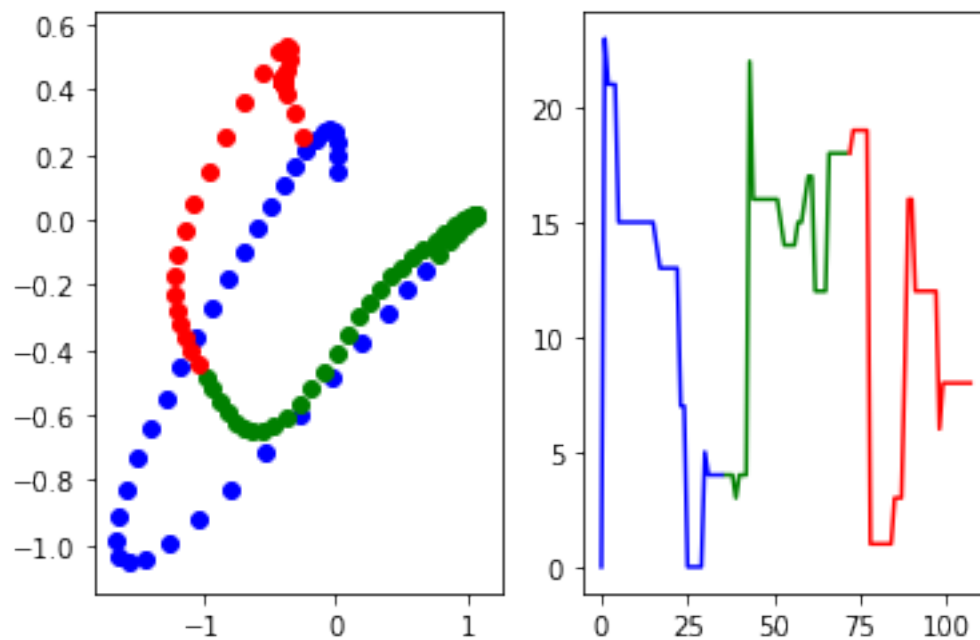
886 ['q']



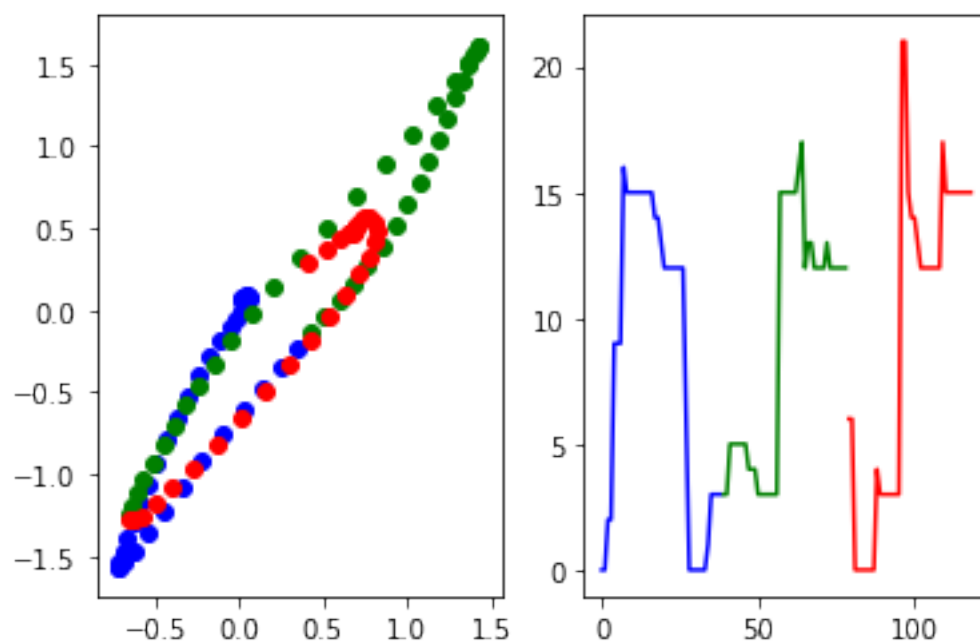
956 ['r']



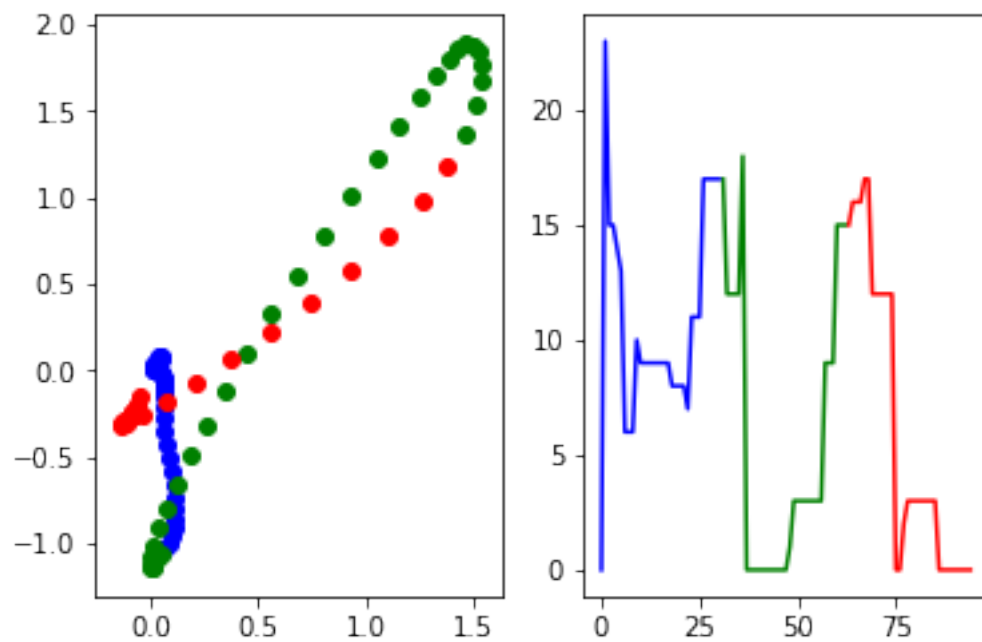
1013 ['s']



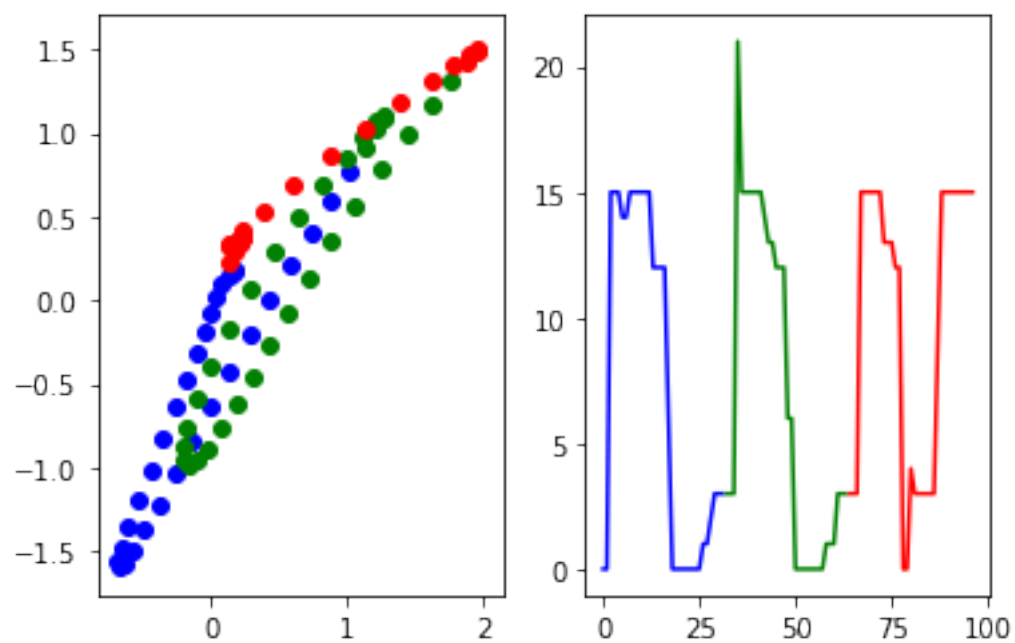
1077 ['u']



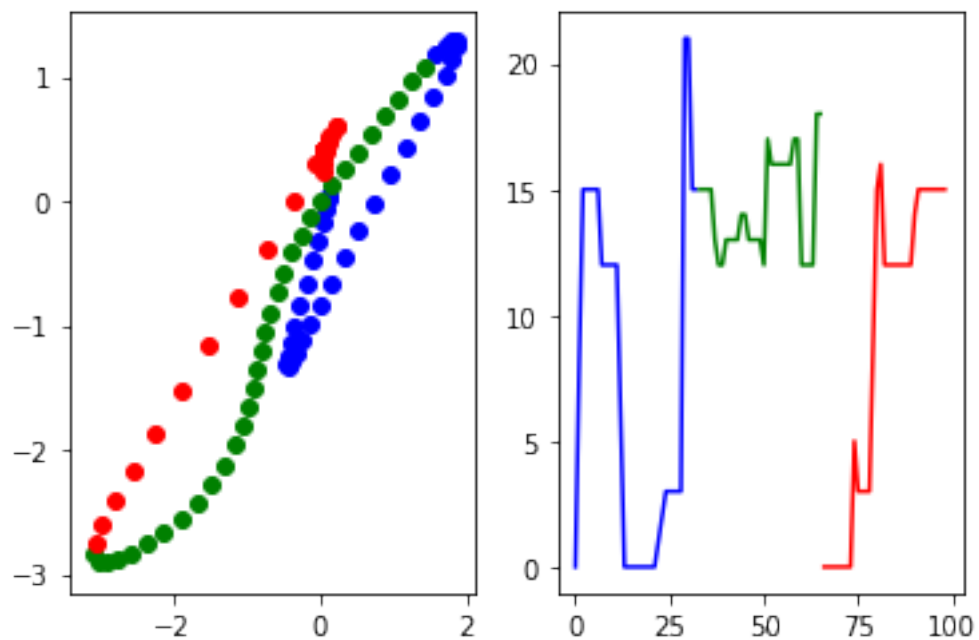
1144 ['v']



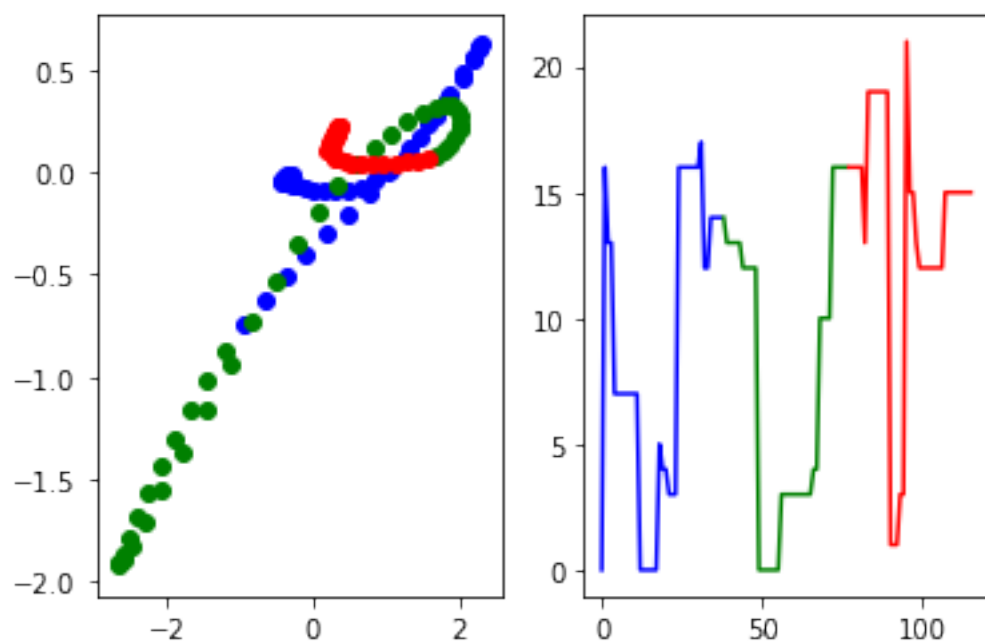
1218 ['w']



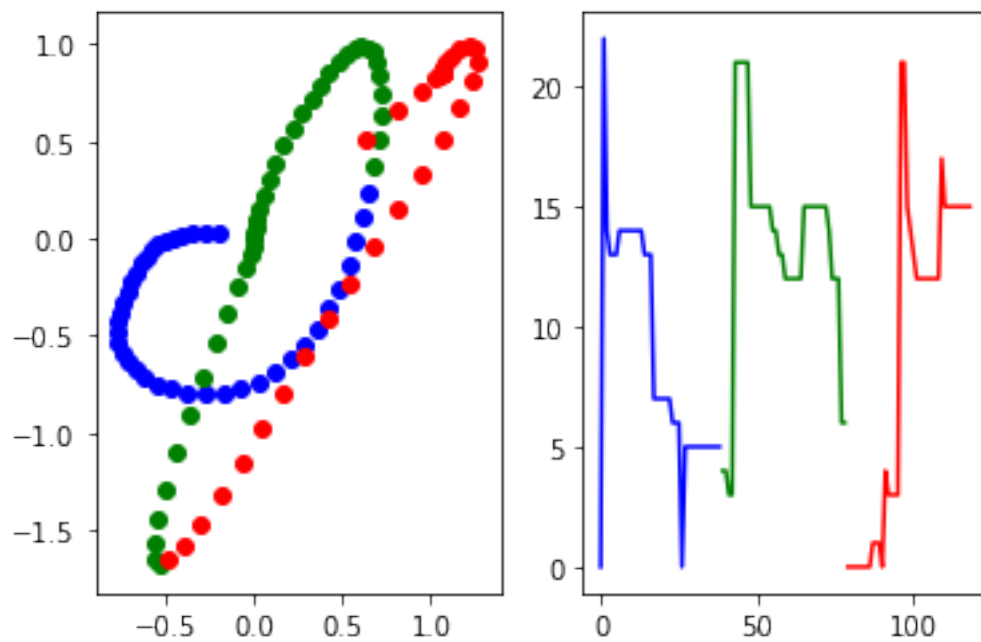
1278 ['y']



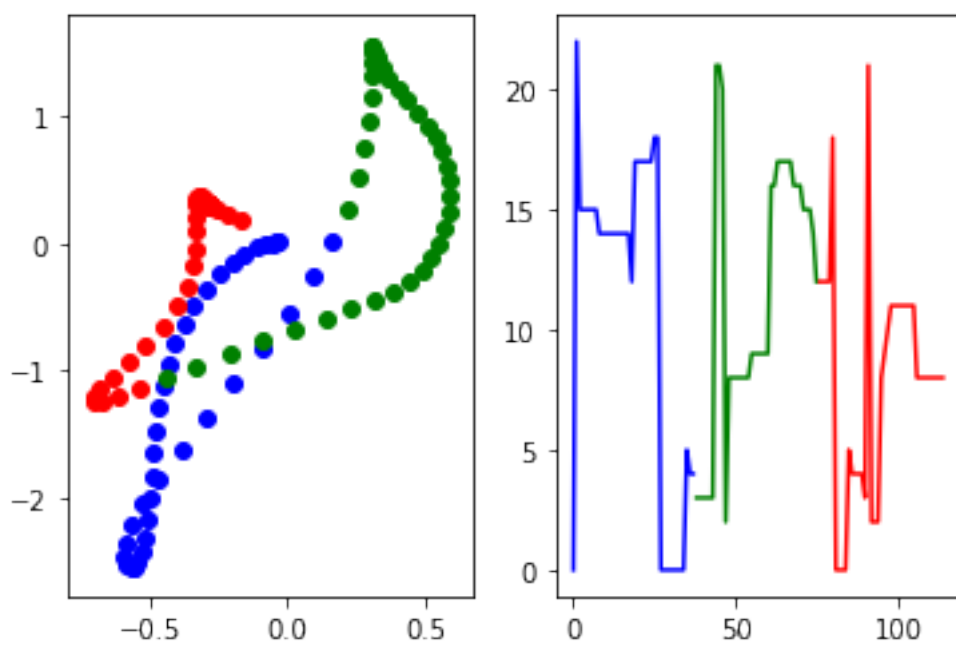
1345 ['z']



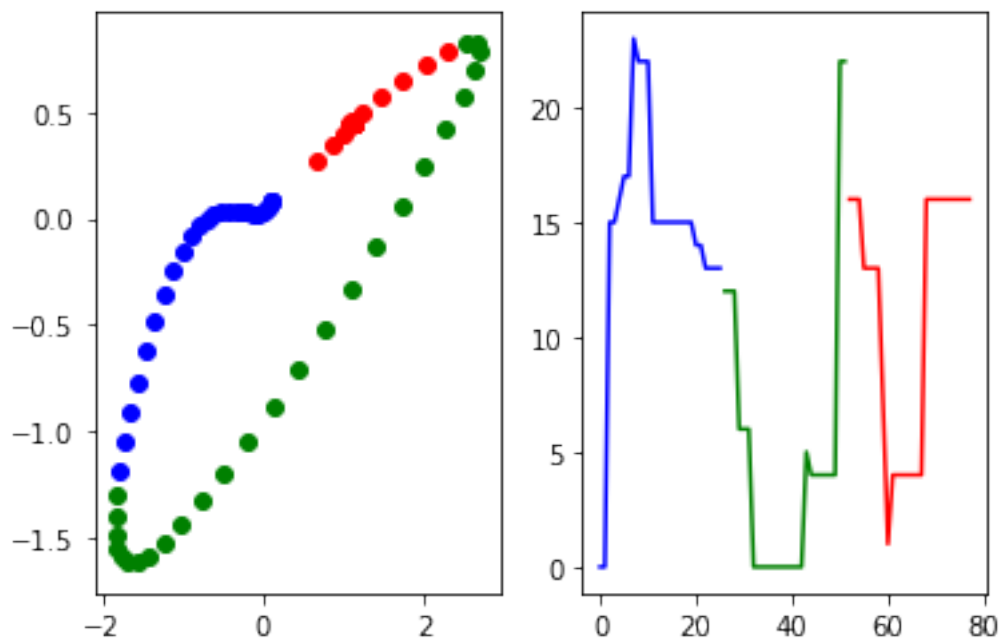
1433 ['a']



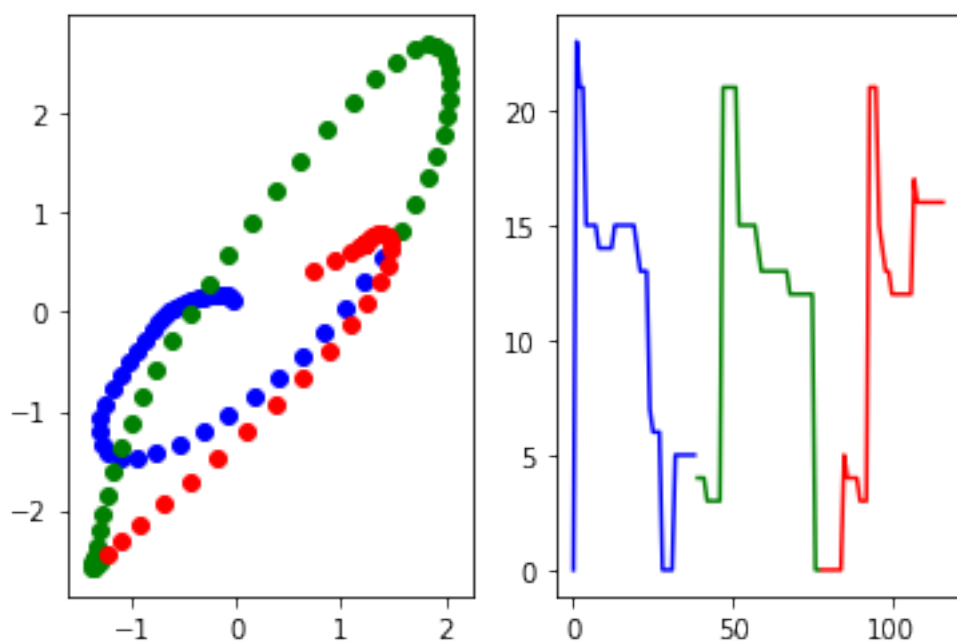
1507 ['b']



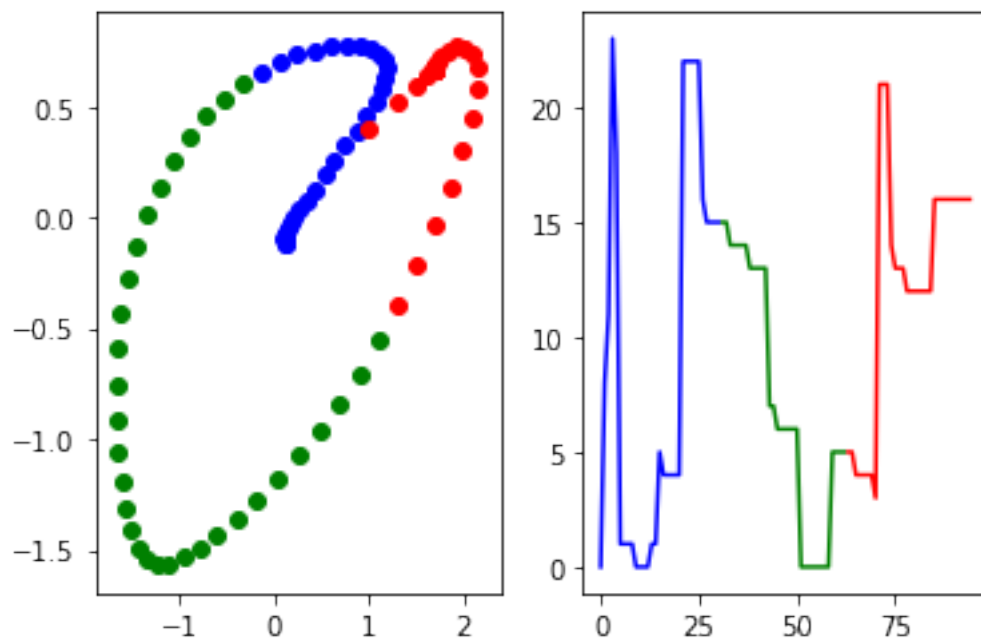
1575 ['c']



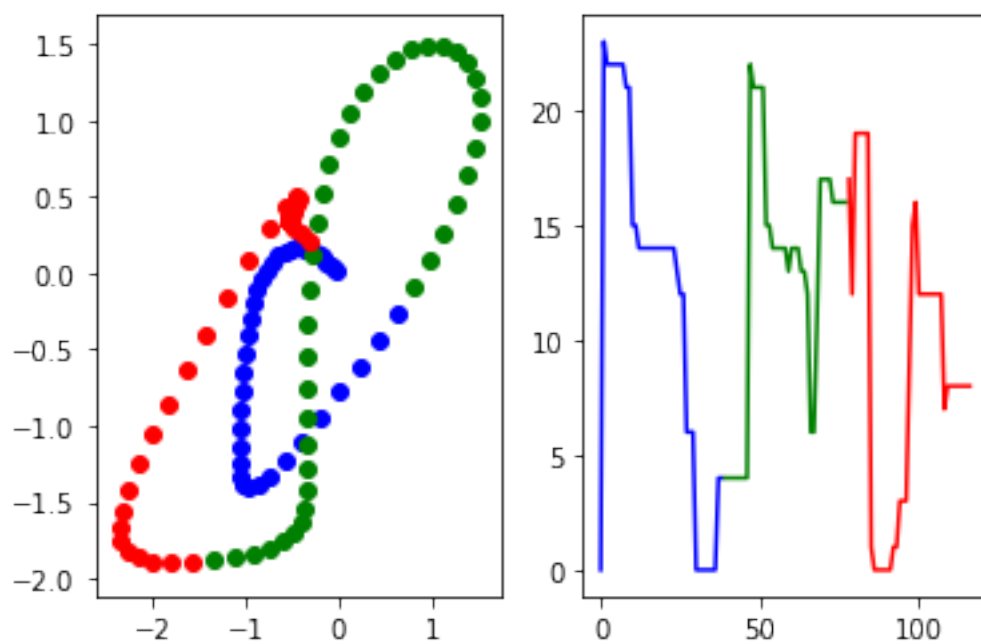
1662 ['d']



1737 ['e']

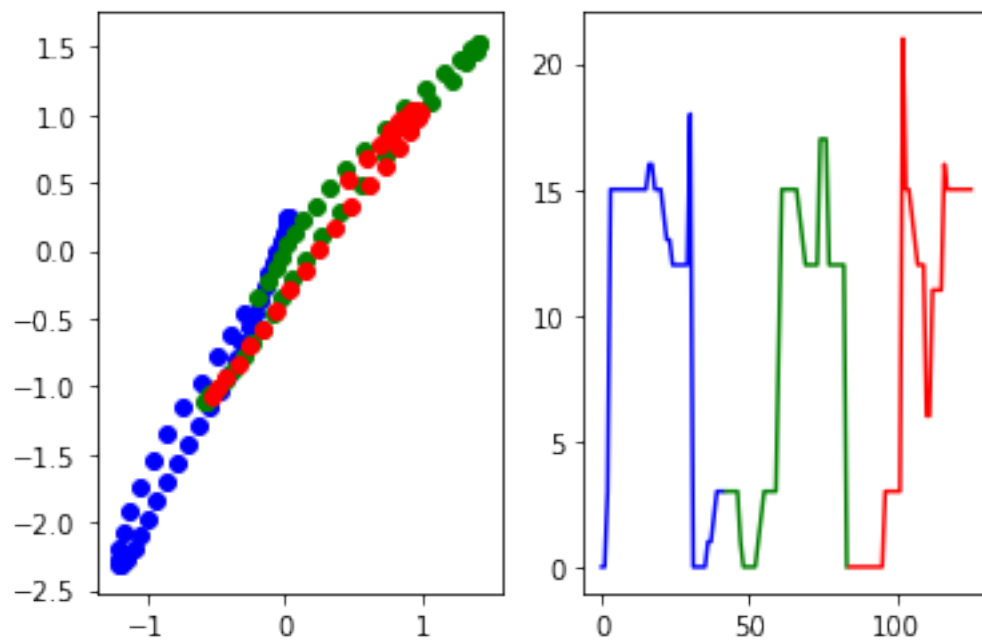


1810 ['g']

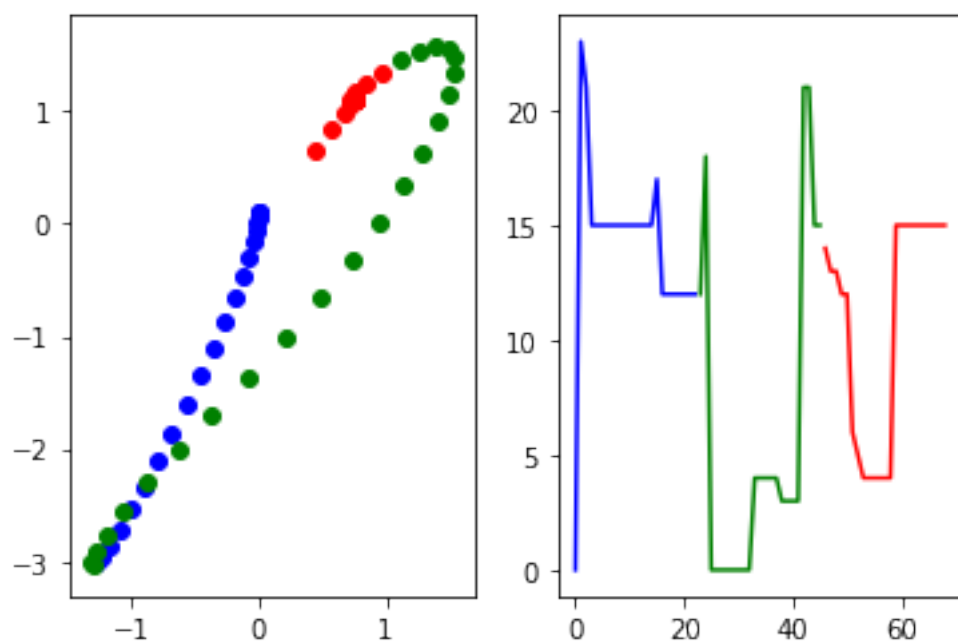


1882 ['h']

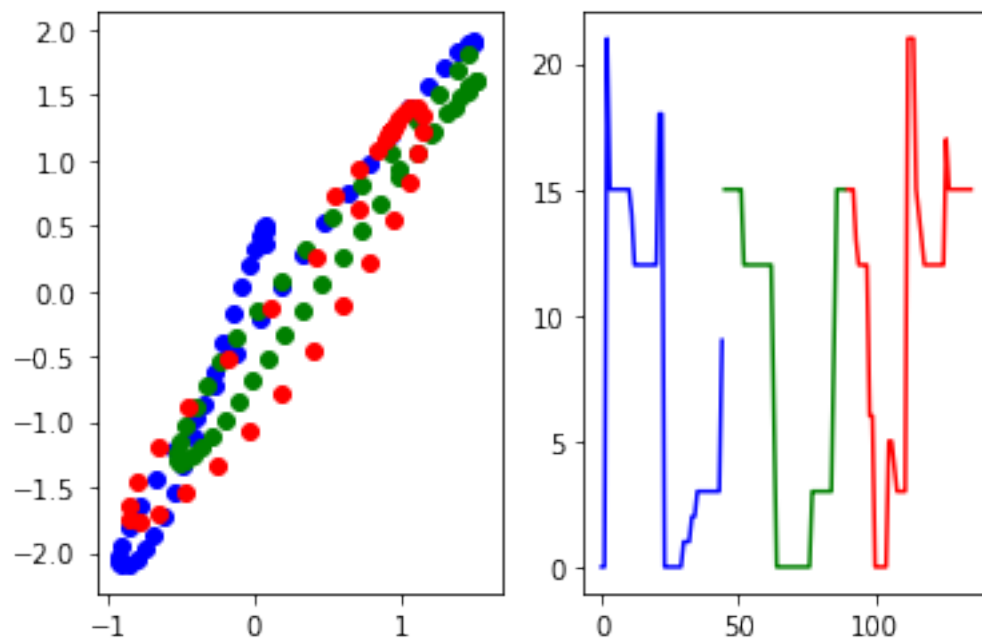




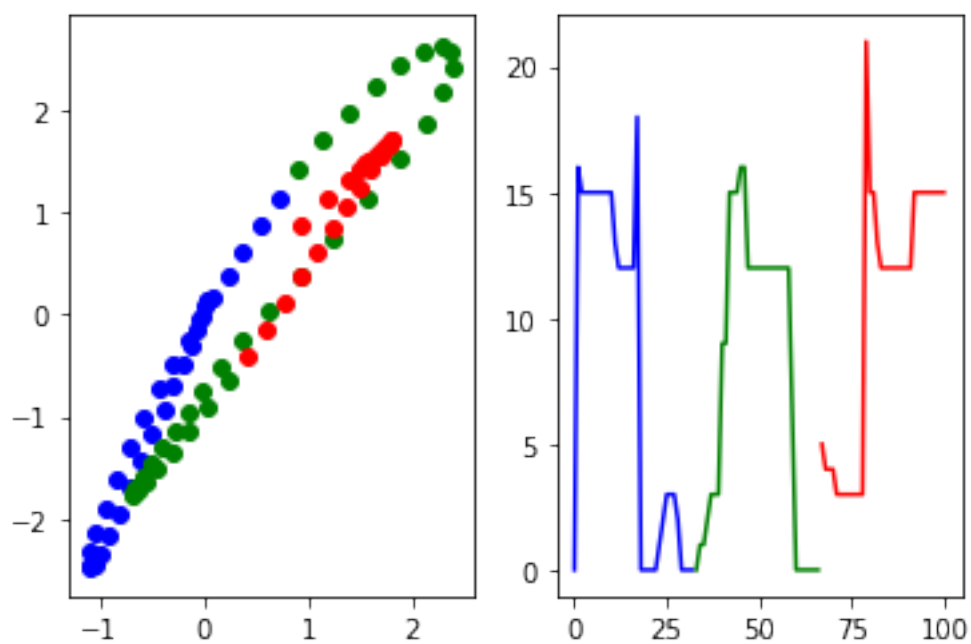
1952 ['1']



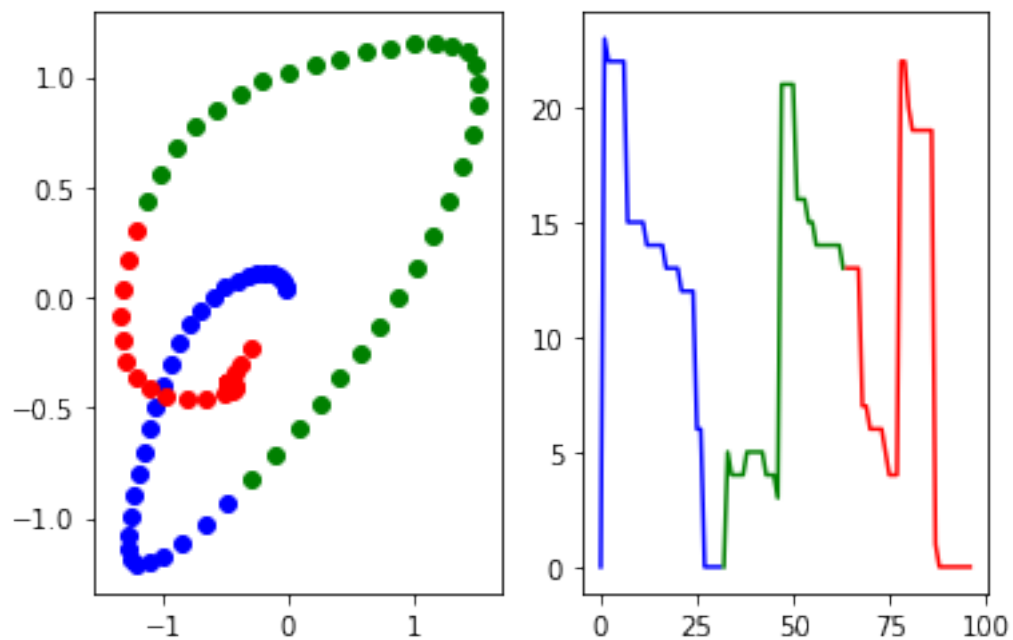
2046 ['m']



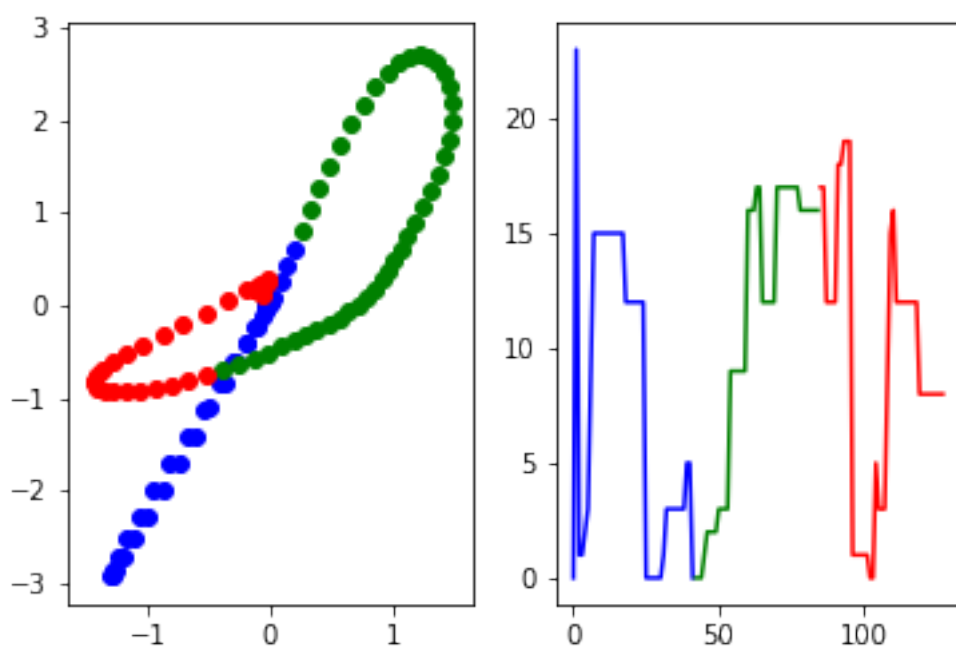
2102 ['n']



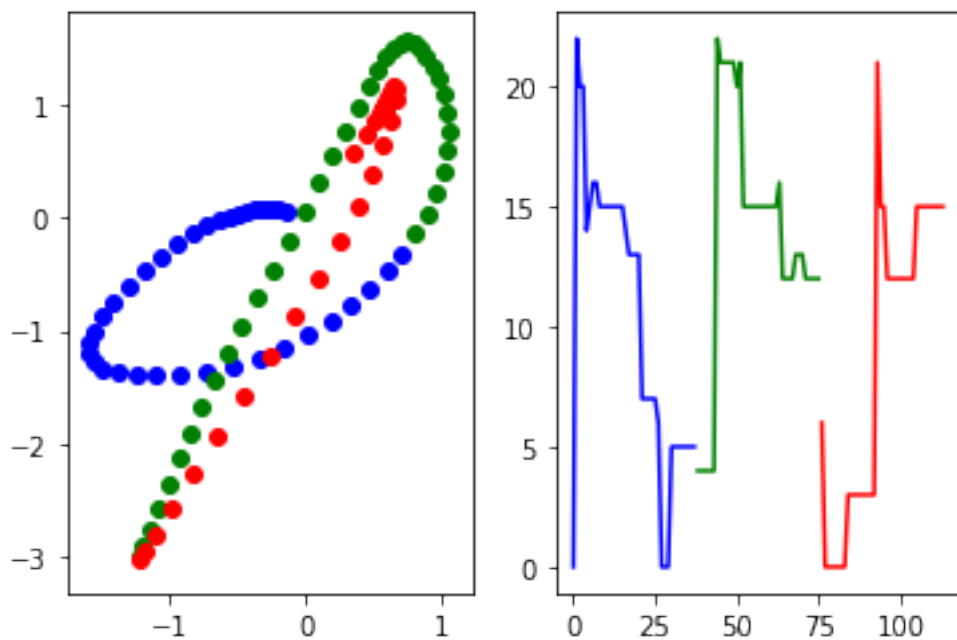
2176 ['o']



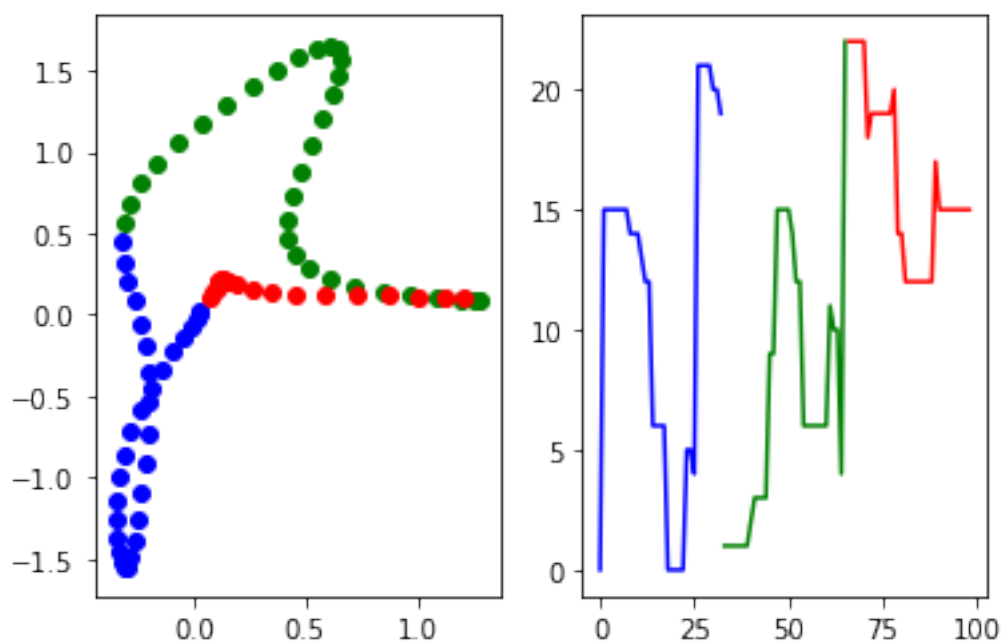
2249 ['p']



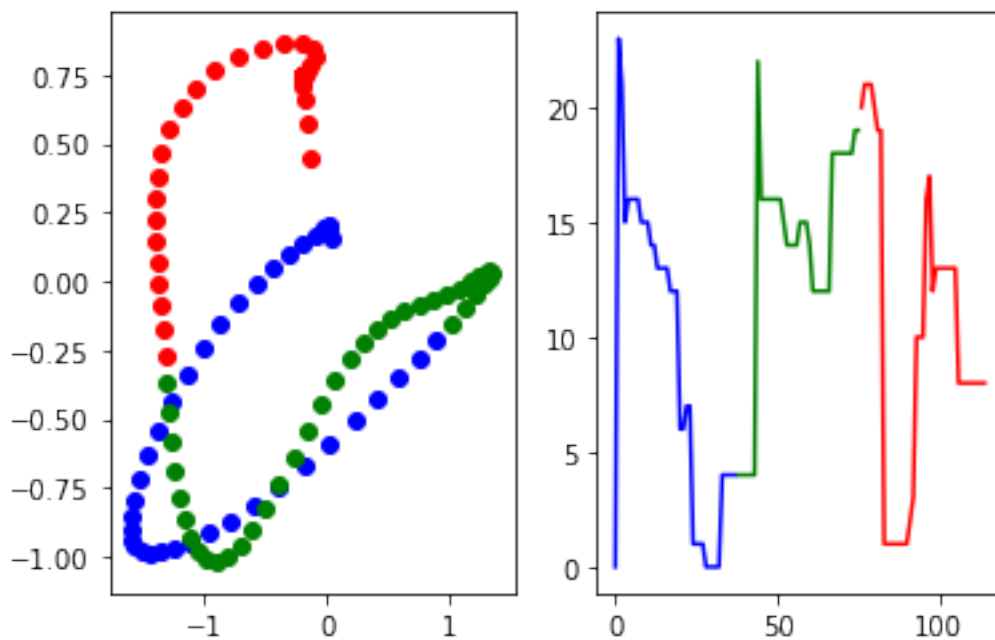
2310 ['q']



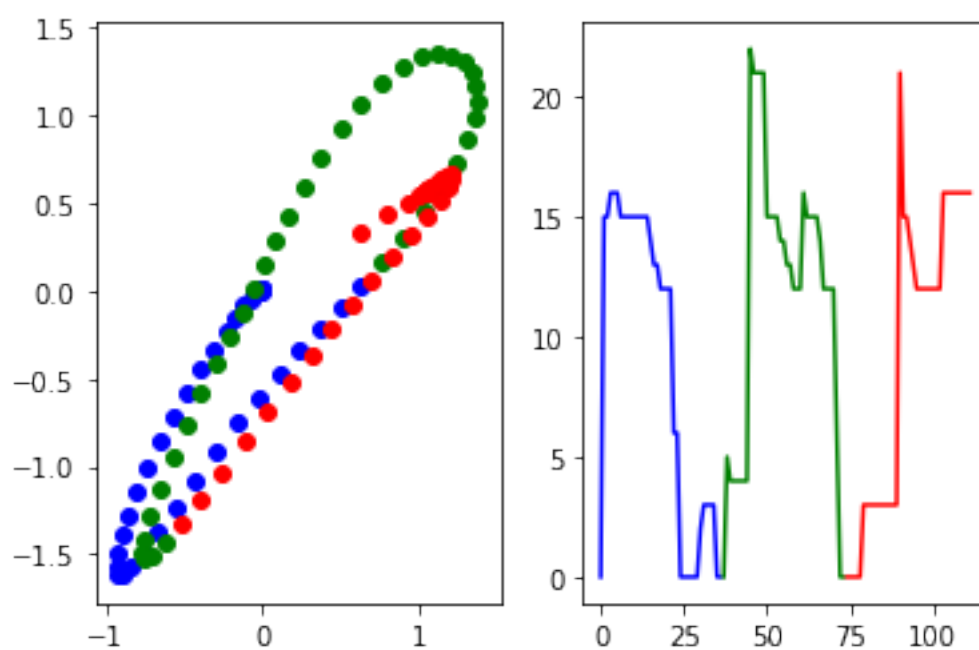
2364 ['r']



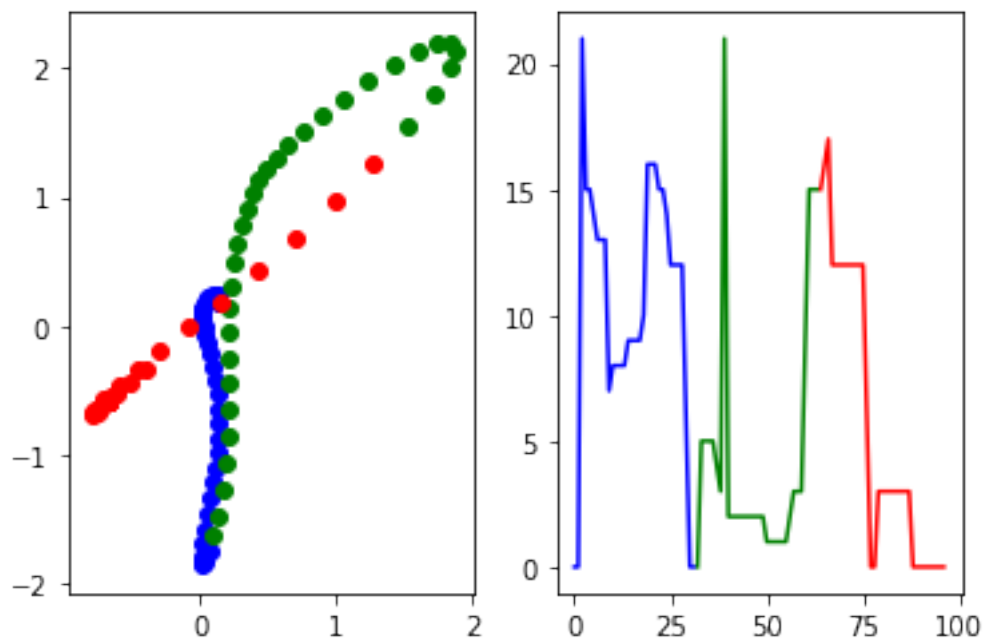
2426 ['s']



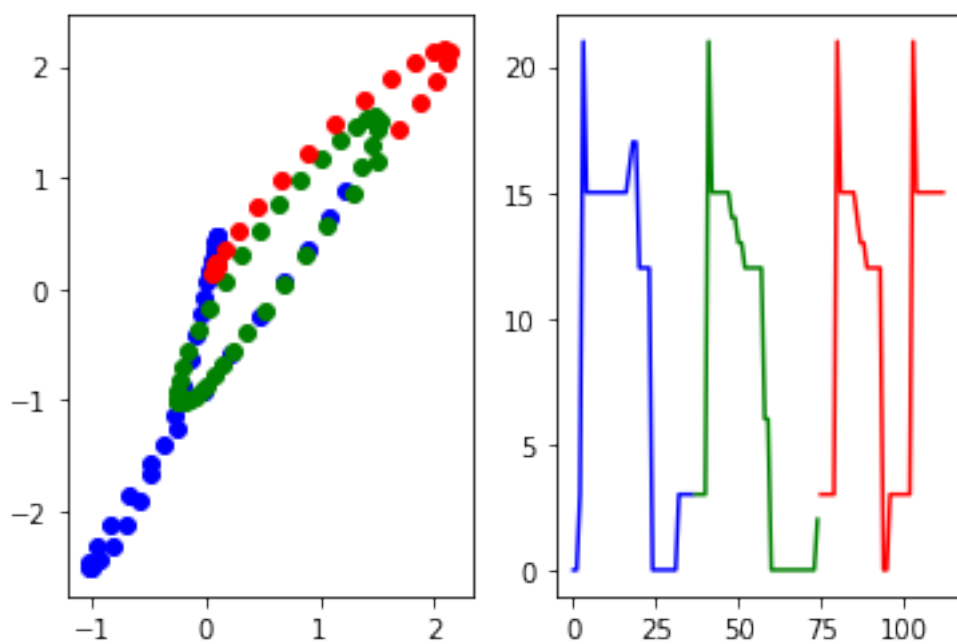
2495 ['u']



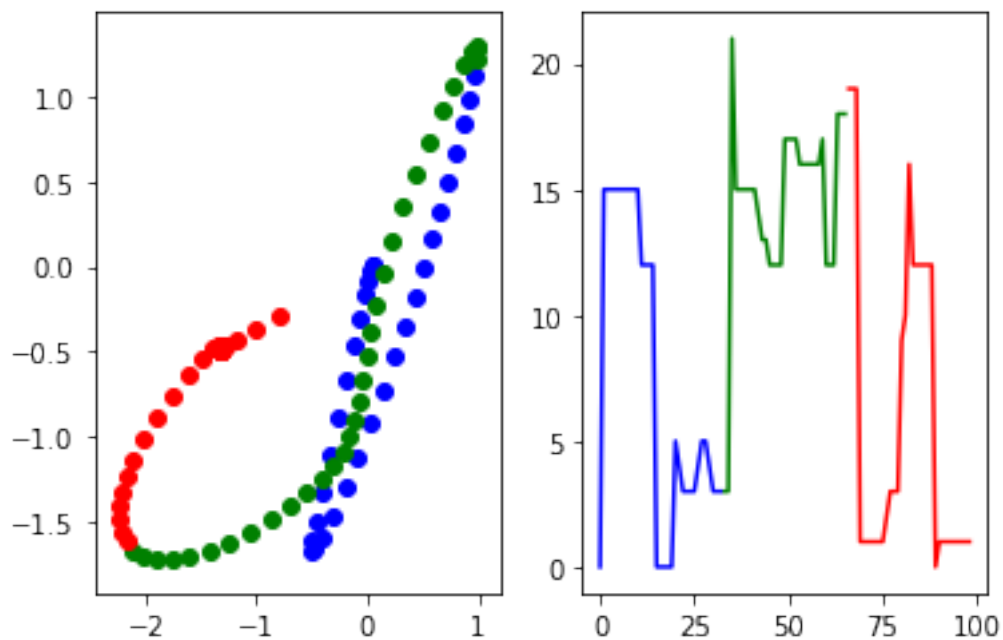
2559 ['v']



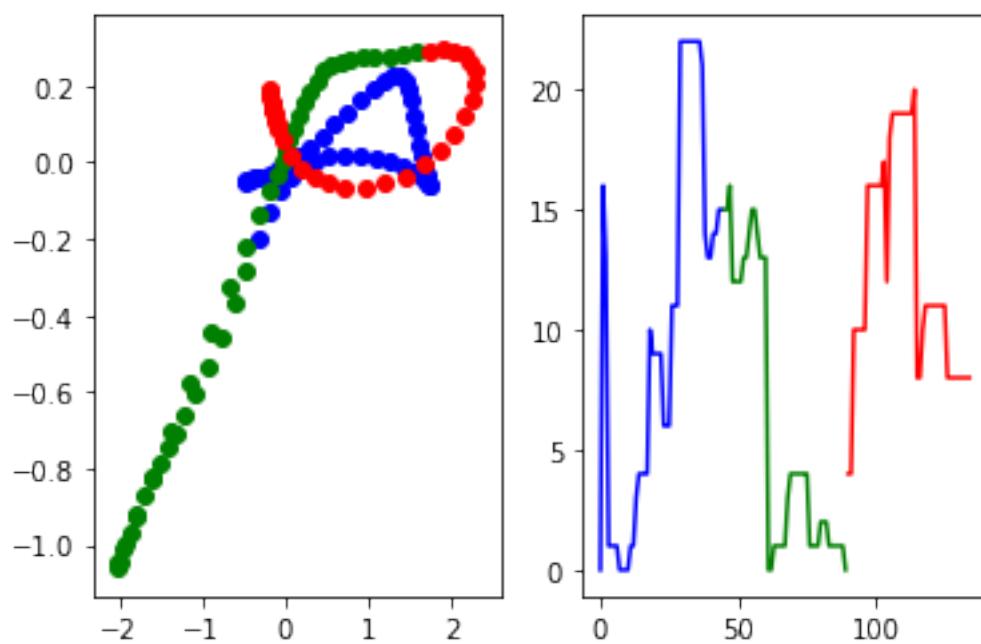
2640 ['w']



2705 ['y']



2775 ['z']



### 1.3 train\_test\_split

- train\_size : test\_size = 90 : 10

```
[5]: from sklearn.model_selection import train_test_split

# train, test split
data = np.array([[charlabels[i], features[i][:], i] for i in
    ↪range(num_mixouts)])
train_data, test_data = train_test_split(data, test_size=0.1)

# sort in charlabel
train_data = train_data[train_data[:, 0].argsort()]
test_data = test_data[test_data[:, 0].argsort()]

print('train:', train_data.shape)
print('test:', test_data.shape)
print(test_data)
```

train: (2572, 3)

test: (286, 3)

[[0

```
array([ 0, 23, 22, 21, 21, 21, 22, 22, 22, 22, 15, 15, 15, 15, 14, 14, 14,
       14, 13, 13, 13, 13, 7, 7, 8, 8, 9, 8, 7, 6, 6, 6, 6, 6,
       0, 0, 0, 0, 5, 4, 4, 4, 4, 4, 5, 5, 5, 5, 5, 5, 5,
       5, 5, 4, 3, 3, 21, 21, 21, 21, 21, 21, 20, 20, 13, 14, 14, 14,
       14, 15, 15, 15, 15, 15, 13, 12, 12, 12, 17, 14, 14, 13, 12, 12, 12,
       12, 12, 12, 6, 6, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
       5, 4, 4, 4, 4, 22, 21, 21, 21, 15, 14, 13, 13, 13, 13, 7, 6,
       11, 10, 4, 4, 4, 4, 4, 16, 15, 15, 15, 15, 15, 15, 15, 15, 15])
```

6]

[0

```
array([ 0, 22, 22, 22, 21, 20, 20, 21, 15, 15, 14, 14, 14, 14, 14, 14, 13,
       13, 13, 13, 13, 13, 13, 7, 7, 7, 7, 7, 7, 7, 6, 6, 0,
       0, 0, 5, 5, 5, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 22, 22,
       21, 21, 21, 21, 21, 21, 21, 21, 21, 15, 15, 15, 15, 15, 15, 14, 14,
       13, 13, 13, 12, 17, 15, 15, 15, 15, 15, 15, 14, 13, 13, 12, 12, 6,
       6, 6, 6, 0, 0, 0, 0, 5, 5, 5, 4, 4, 4, 4, 5, 5, 5,
       3, 3, 3, 3, 21, 21, 15, 15, 15, 14, 13, 12, 12, 6, 0, 5, 4,
       4, 4, 4, 4, 4, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15])
```

1482]

[0

```
array([ 0, 0, 22, 22, 22, 22, 22, 22, 22, 21, 14, 14, 14, 14, 14, 14, 13,
       13, 13, 13, 13, 12, 12, 12, 12, 12, 12, 13, 14, 14, 14, 13, 7, 7,
       7, 7, 7, 7, 1, 0, 0, 0, 5, 4, 4, 5, 5, 5, 5, 5, 5, 4,
       4, 4, 4, 3, 3, 3, 21, 21, 21, 21, 21, 21, 22, 21, 21, 20, 20,
       14, 14, 14, 14, 14, 15, 15, 15, 15, 15, 16, 16, 16, 12, 13, 13, 13,
       12, 12, 12, 12, 12, 12, 6, 0, 0, 0, 0, 0, 0, 1, 1, 1, 1,
```



```

        1, 1, 2, 4, 4, 4, 4, 4, 4, 22, 22, 21, 15, 14, 13, 13, 13,
        7, 6, 11, 10, 10, 10, 10, 10, 10, 16, 15, 15, 15, 15, 15, 15,
        15, 15])
86]
[0
array([ 0, 23, 19, 1, 1, 4, 22, 22, 21, 21, 15, 15, 15, 15, 15, 15,
        15, 15, 15, 15, 15, 15, 14, 14, 13, 13, 13, 6, 6, 6, 0, 0, 0,
        0, 0, 4, 4, 4, 4, 4, 4, 4, 4, 5, 4, 4, 4, 3, 3, 3, 3,
        21, 21, 21, 21, 20, 19, 19, 19, 19, 21, 21, 15, 15, 15, 15, 15, 15,
        14, 14, 14, 14, 14, 14, 15, 15, 15, 15, 15, 13, 12, 12, 12, 12, 12,
        12, 6, 6, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 4, 4, 4,
        4, 4, 4, 4, 4, 22, 22, 21, 21, 15, 14, 13, 13, 13, 13, 6, 11,
        11, 10, 10, 10, 10, 10, 16, 15, 15, 15, 15, 15, 15, 15, 15, 15])
38]
[0
array([ 0, 0, 3, 3, 3, 21, 15, 15, 15, 16, 16, 16, 15, 14, 14, 14, 14,
        15, 15, 15, 15, 15, 15, 15, 15, 14, 14, 14, 14, 14, 13, 13, 13, 13,
        7, 7, 6, 6, 6, 0, 0, 0, 0, 0, 5, 5, 4, 4, 4, 4, 4,
        4, 4, 4, 3, 3, 3, 3, 3, 21, 21, 21, 22, 22, 22, 20, 21, 15,
        15, 15, 15, 15, 15, 14, 13, 12, 12, 17, 16, 16, 15, 14, 13, 13,
        13, 13, 12, 12, 6, 6, 6, 6, 0, 0, 0, 0, 0, 0, 0, 0, 1,
        1, 0, 0, 4, 4, 4, 4, 4, 22, 22, 21, 21, 15, 13, 13, 13, 7,
        6, 11, 10, 10, 10, 10, 10, 10, 16, 15, 15, 15, 15, 15, 15, 15, 15,
        15])
54]
[0
array([ 0, 23, 22, 21, 21, 20, 20, 14, 14, 14, 14, 14, 14, 14, 14, 15,
        16, 16, 16, 15, 15, 15, 15, 15, 15, 15, 14, 14, 13, 13, 13, 7, 7,
        6, 6, 0, 0, 0, 0, 5, 5, 5, 4, 4, 4, 4, 4, 4, 3,
        3, 3, 3, 21, 21, 21, 21, 20, 20, 20, 20, 20, 15, 15, 15, 15, 15,
        15, 15, 15, 16, 16, 16, 15, 15, 15, 15, 14, 13, 13, 13, 13, 7,
        6, 6, 6, 6, 0, 0, 0, 0, 0, 0, 0, 0, 5, 4, 4, 4, 4,
        4, 4, 3, 3, 21, 21, 21, 21, 21, 21, 21, 15, 14, 14, 13, 12, 12,
        12, 12, 12, 12, 12, 17, 15, 15, 15, 15, 15, 15, 15, 15, 15])
51]
[0
array([ 0, 23, 22, 22, 22, 22, 22, 15, 15, 15, 15, 15, 15, 14, 14, 13, 13,
        13, 13, 13, 7, 7, 7, 7, 7, 7, 7, 7, 7, 7, 1, 0, 0, 0,
        5, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5, 4, 4, 4, 22, 21, 21,
        21, 21, 21, 15, 15, 14, 14, 14, 14, 14, 13, 13, 14, 14, 15, 15, 15,
        14, 14, 14, 13, 12, 12, 12, 6, 6, 6, 6, 0, 0, 0, 0, 0, 0,
        0, 0, 0, 0, 0, 1, 1, 1, 3, 3, 3, 3, 3, 3, 15, 15, 14,
        12, 12, 12, 12, 12, 12, 12, 12, 15, 15, 15, 15, 15, 15, 15, 15,
        15])
1439]
[0
array([ 0, 22, 23, 18, 19, 19, 20, 21, 22, 22, 22, 16, 15, 15, 15, 14, 14,
        14, 14, 14, 14, 13, 13, 13, 13, 7, 7, 7, 7, 7, 7, 6, 6,

```

```

        6, 6, 0, 0, 0, 0, 0, 0, 1, 1, 1, 1, 0, 0, 5, 5, 4,
        4, 4, 4, 21, 21, 21, 21, 21, 19, 19, 19, 19, 19, 19, 20, 20, 21,
21, 15, 15, 15, 15, 15, 15, 15, 14, 14, 15, 15, 15, 15, 15, 14, 13,
13, 12, 12, 12, 6, 6, 6, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1,
1, 1, 1, 4, 4, 4, 4, 4, 4, 22, 22, 21, 21, 21, 14, 13, 13,
13, 7, 6, 11, 11, 11, 11, 11, 11, 11, 16, 15, 15, 15, 15, 15, 15,
15, 15, 15])
77]
[0
array([ 0, 22, 22, 23, 19, 20, 20, 20, 14, 14, 14, 14, 15, 15, 15, 15, 15,
15, 15, 15, 15, 14, 13, 13, 13, 13, 13, 13, 7, 7, 7, 6, 6, 0,
0, 0, 0, 5, 5, 4, 4, 4, 4, 4, 4, 4, 4, 22, 21, 21,
21, 21, 21, 20, 19, 19, 20, 20, 21, 15, 15, 15, 15, 15, 15, 14, 14,
14, 13, 13, 13, 13, 14, 14, 14, 14, 13, 12, 12, 12, 12, 6, 6, 6,
6, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 3, 3, 4, 4, 4,
4, 4, 22, 22, 15, 15, 13, 13, 13, 13, 7, 11, 10, 4, 4, 4, 4,
4, 16, 15, 15, 15, 15, 15, 15, 15, 15, 15])
85]
[0
array([ 0, 23, 21, 21, 15, 15, 15, 16, 16, 16, 15, 15, 15, 15, 15, 15, 14,
14, 13, 13, 13, 13, 13, 7, 7, 6, 6, 6, 6, 0, 0, 0, 0, 0,
5, 5, 4, 4, 4, 4, 4, 5, 0, 0, 0, 5, 4, 4, 3, 3, 21,
21, 21, 15, 15, 15, 14, 14, 13, 13, 13, 13, 14, 14, 13, 13, 12, 17,
16, 16, 15, 15, 15, 14, 14, 13, 13, 12, 12, 12, 6, 6, 6, 6, 0,
0, 0, 0, 0, 0, 5, 4, 4, 0, 0, 0, 0, 0, 0, 1, 1,
3, 3, 3, 3, 15, 15, 15, 15, 17, 12, 12, 12, 0, 0, 3, 3, 3,
3, 3, 3, 3, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15])
1502]
[0
array([ 0, 23, 20, 20, 21, 21, 15, 15, 15, 15, 16, 16, 16, 15, 15, 15, 15,
14, 13, 13, 13, 13, 13, 13, 7, 7, 7, 7, 7, 7, 7, 6, 11,
11, 11, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5, 4, 4, 4,
22, 21, 21, 21, 21, 21, 21, 21, 21, 21, 20, 14, 14, 14, 14, 14,
14, 14, 14, 17, 17, 17, 12, 12, 12, 13, 13, 13, 13, 12, 12, 12, 12,
12, 6, 6, 0, 0, 0, 0, 0, 0, 0, 0, 5, 4, 4, 5, 5, 5,
4, 4, 4, 3, 3, 21, 21, 21, 15, 15, 14, 13, 13, 13, 6, 6, 11,
11, 11, 11, 11, 16, 15, 15, 15, 15, 15, 15, 15, 15, 15])
1480]
[0
array([ 0, 22, 15, 14, 14, 14, 17, 17, 17, 16, 16, 16, 16, 22, 22, 16, 15,
15, 15, 15, 15, 15, 14, 14, 13, 13, 13, 12, 6, 6, 6, 6, 0,
0, 0, 0, 1, 2, 3, 3, 4, 5, 0, 0, 0, 0, 0, 0, 0, 5,
4, 4, 4, 4, 4, 21, 21, 21, 21, 21, 19, 19, 19, 19, 19, 19, 20,
20, 14, 15, 15, 15, 15, 15, 15, 12, 12, 12, 16, 16, 15, 15, 15, 13,
12, 12, 12, 12, 12, 12, 12, 12, 6, 0, 0, 0, 0, 0, 0, 0, 0,
0, 0, 0, 0, 4, 3, 3, 3, 3, 3, 3, 3, 21, 21, 15, 15, 14, 13,
13, 13, 7, 6, 11, 10, 10, 4, 4, 4, 4, 16, 15, 15, 15, 15, 15,
15, 15, 15, 15])

```



```

        12, 6, 6, 11, 11, 11, 11, 11, 16, 15, 15, 15, 15, 15, 15, 15, 15,
        15])
1460]
[0
array([ 0, 22, 21, 19, 19, 19, 18, 23, 22, 22, 21, 15, 15, 15, 15, 15, 15,
        14, 14, 14, 13, 13, 13, 12, 12, 6, 6, 6, 6, 7, 7, 7, 1, 1,
        1, 1, 0, 5, 5, 5, 5, 5, 5, 5, 5, 0, 0, 0, 0, 5, 3, 3,
        3, 4, 4, 22, 22, 22, 22, 23, 18, 18, 19, 20, 21, 21, 15, 15, 15,
        15, 15, 15, 14, 14, 13, 12, 16, 16, 17, 12, 12, 12, 12, 12, 12, 12,
        12, 12, 12, 6, 6, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 5, 5,
        4, 4, 4, 4, 3, 21, 21, 21, 15, 15, 13, 13, 13, 7, 6, 11, 10,
        4, 4, 4, 4, 4, 16, 15, 15, 15, 15, 15, 15, 15, 15, 15])
43]
[0
array([ 0, 23, 21, 21, 15, 16, 16, 16, 15, 15, 15, 15, 15, 15, 15, 14, 14,
        14, 13, 13, 13, 13, 7, 7, 7, 7, 7, 6, 6, 6, 6, 0, 5, 5,
        5, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5, 4, 3, 3,
        21, 21, 21, 21, 21, 21, 15, 14, 14, 14, 14, 14, 14, 14, 14, 14,
        13, 17, 17, 12, 12, 12, 12, 12, 12, 12, 6, 6, 6, 6, 6, 6, 6,
        0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 2, 3, 3,
        3, 3, 3, 21, 21, 15, 14, 13, 12, 12, 12, 12, 12, 12, 12, 17,
        15, 15, 15, 15, 15, 15, 15, 15, 15])
1489]
[1
array([ 0, 23, 8, 8, 15, 15, 15, 15, 15, 15, 15, 15, 16, 16, 17, 12, 12,
        12, 12, 12, 12, 12, 12, 12, 12, 18, 0, 0, 0, 0, 0, 0, 0, 5,
        4, 4, 3, 3, 3, 3, 3, 0, 0, 0, 0, 0, 0, 1, 2, 2, 2,
        2, 3, 3, 3, 9, 9, 9, 9, 9, 9, 9, 16, 16, 16, 16, 16, 16, 15,
        16, 16, 16, 16, 16, 16, 16, 17, 17, 17, 12, 12, 12, 12, 18, 18, 18,
        18, 23, 21, 21, 21, 21, 15, 15, 14, 13, 13, 19, 1, 1, 1, 0, 1,
        1, 1, 3, 4, 4, 4, 3, 3, 3, 15, 15, 12, 12, 12, 12, 12, 12,
        12, 6, 7, 7, 7, 7, 7, 7, 7, 7, 7])
139]
[1
array([ 0, 15, 15, 15, 15, 14, 14, 15, 15, 15, 15, 16, 16, 17, 17, 17, 17,
        17, 12, 12, 12, 12, 12, 12, 12, 18, 0, 0, 0, 0, 0, 0, 5, 4, 3,
        3, 3, 3, 3, 4, 4, 5, 0, 1, 2, 2, 2, 2, 2, 3, 9, 9,
        9, 9, 15, 15, 16, 17, 12, 12, 12, 12, 17, 16, 16, 16, 16, 17, 17,
        17, 17, 12, 12, 12, 17, 17, 17, 12, 12, 12, 12, 18, 18, 18, 18, 18,
        19, 19, 1, 1, 1, 1, 1, 1, 1, 1, 3, 3, 3, 3, 15, 16, 12,
        12, 12, 12, 12, 12, 6, 7, 7, 7, 7, 7, 7, 7, 7, 7])
110]
[1
array([ 0, 23, 20, 14, 13, 7, 7, 9, 9, 15, 15, 15, 15, 15, 15, 15, 15,
        15, 12, 12, 12, 12, 12, 12, 12, 12, 18, 18, 0, 0, 0, 0, 0, 0,
        0, 3, 3, 3, 3, 3, 3, 3, 3, 3, 4, 5, 0, 0, 0, 1, 2, 2,
        2, 2, 2, 2, 2, 2, 8, 9, 9, 9, 9, 9, 9, 9, 10, 16, 16,
        16, 16, 16, 16, 16, 16, 15, 14, 13, 13, 12, 12, 12, 12, 12, 12,

```

```

12, 17, 17, 16, 15, 15, 13, 12, 12, 18, 18, 18, 0, 0, 0, 1, 1,
1, 1, 5, 4, 4, 3, 3, 3, 9, 15, 16, 12, 12, 12, 12, 12, 12,
12, 12, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15])
1512]
[1
array([ 0, 22, 15, 15, 14, 14, 14, 14, 14, 14, 14, 12, 12, 12, 12, 12, 17,
17, 17, 17, 17, 17, 17, 12, 18, 18, 0, 0, 0, 0, 0, 0, 5, 4,
4, 3, 3, 3, 3, 3, 4, 4, 5, 1, 2, 2, 2, 2, 2, 2, 2,
9, 9, 9, 9, 9, 10, 16, 17, 17, 17, 16, 16, 15, 15, 15, 15, 16,
16, 16, 16, 16, 16, 16, 17, 17, 17, 12, 12, 12, 12, 12, 12, 18, 18,
18, 18, 18, 0, 0, 0, 1, 1, 1, 2, 1, 0, 0, 1, 3, 3, 3,
9, 15, 16, 12, 12, 12, 12, 12, 12, 12, 6, 8, 8, 8, 8, 8, 8,
8, 8, 8])
1509]
[1
array([ 0, 1, 9, 15, 15, 15, 15, 15, 15, 15, 15, 15, 14, 12, 12, 12, 12,
12, 12, 12, 12, 12, 12, 18, 23, 23, 23, 18, 18, 18, 0, 0, 0, 0,
0, 0, 5, 4, 3, 3, 3, 4, 4, 4, 0, 1, 1, 1, 1, 2, 2,
2, 3, 3, 3, 9, 9, 9, 9, 15, 15, 17, 17, 17, 16, 16, 16, 15,
14, 14, 14, 13, 12, 12, 12, 17, 17, 17, 17, 17, 23, 22, 22, 22, 22,
22, 21, 20, 19, 13, 19, 19, 13, 13, 13, 13, 13, 13, 19, 18, 0, 0,
0, 0, 0, 0, 1, 3, 3, 3, 9, 15, 16, 12, 12, 12, 12, 12,
12, 12, 12, 8, 8, 8, 8, 8, 8, 8, 8, 8])
116]
[1
array([ 0, 1, 15, 15, 15, 15, 15, 15, 15, 15, 15, 17, 12, 12, 12, 12, 17,
17, 12, 12, 12, 12, 18, 0, 0, 0, 0, 0, 0, 0, 0, 3, 3, 3,
3, 3, 3, 4, 4, 4, 4, 4, 3, 3, 3, 2, 2, 2, 2, 2, 2,
8, 9, 9, 9, 9, 9, 9, 9, 16, 16, 16, 17, 17, 12, 12, 12, 12, 17,
16, 16, 16, 16, 16, 16, 16, 15, 13, 13, 12, 12, 12, 12, 18, 18, 18,
23, 22, 22, 22, 21, 21, 21, 15, 14, 13, 13, 19, 1, 1, 1, 1, 1,
0, 0, 4, 3, 3, 3, 15, 16, 12, 12, 12, 12, 12, 12, 12, 6, 1,
1, 1, 1, 1, 1, 1, 1, 1])
128]
[1
array([ 0, 16, 15, 15, 14, 14, 14, 14, 15, 15, 15, 15, 15, 15, 16, 16, 17,
17, 17, 17, 17, 12, 12, 12, 12, 18, 18, 0, 0, 0, 0, 0, 0, 0,
3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 4, 4, 0, 0, 0, 0, 0, 0,
0, 1, 2, 2, 3, 3, 3, 9, 9, 15, 15, 15, 16, 17, 12, 12, 12,
12, 12, 12, 12, 13, 14, 15, 15, 15, 15, 15, 15, 17, 17, 17, 17,
17, 23, 23, 18, 19, 21, 21, 21, 15, 15, 15, 15, 15, 16, 16, 17, 12,
12, 12, 18, 18, 18, 19, 1, 1, 1, 1, 1, 2, 3, 3, 4, 4, 4,
4, 4, 3, 3, 3, 9, 15, 16, 12, 12, 12, 12, 12, 12, 12, 12, 15,
15, 15, 15, 15, 15, 15, 15])
1556]
[1
array([ 0, 15, 15, 15, 15, 15, 15, 15, 15, 14, 14, 12, 12, 12, 12, 17, 17,
17, 17, 16, 15, 15, 15, 15, 16, 17, 17, 12, 12, 18, 18, 0, 0, 0,

```

```

    0, 0, 0, 3, 3, 3, 3, 3, 3, 3, 4, 5, 0, 0, 0, 0, 1,
    2, 2, 2, 2, 2, 3, 3, 9, 9, 9, 9, 15, 15, 15, 15, 16, 17,
17, 17, 12, 12, 12, 12, 12, 12, 13, 7, 7, 8, 8, 8, 9, 11, 11,
    6, 11, 11, 11, 5, 23, 22, 22, 22, 15, 15, 15, 15, 15, 15, 15, 16,
17, 12, 12, 12, 12, 12, 12, 12, 18, 18, 18, 18, 18, 1, 1, 1, 1,
    1, 1, 0, 0, 0, 0, 5, 4, 3, 3, 3, 3, 15, 15, 12, 12, 12,
12, 12, 12, 12, 12, 12, 15, 15, 15, 15, 15, 15, 15, 15, 15])
1539]
[1
array([ 0, 23, 21, 15, 15, 14, 13, 13, 7, 7, 6, 6, 6, 11, 10, 10, 15,
    15, 15, 15, 15, 16, 17, 12, 12, 12, 12, 12, 18, 18, 0, 0, 0, 0,
    0, 0, 0, 5, 4, 4, 4, 4, 4, 4, 5, 0, 0, 0, 1, 1, 1,
    2, 2, 2, 3, 3, 3, 9, 9, 9, 9, 15, 15, 16, 17, 12, 12, 12,
12, 6, 6, 6, 11, 11, 16, 16, 16, 16, 16, 16, 16, 16, 16, 16, 17,
12, 13, 13, 13, 13, 19, 18, 18, 18, 18, 19, 19, 1, 1, 1, 1, 1,
    1, 1, 1, 0, 0, 4, 4, 4, 4, 10, 16, 16, 12, 13, 13, 12, 12,
12, 12, 13, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15])
140]
[1
array([ 0, 16, 15, 15, 14, 14, 15, 15, 15, 15, 15, 15, 15, 15, 17, 17, 17,
    17, 17, 17, 17, 17, 17, 12, 12, 12, 18, 18, 0, 0, 0, 0,
    0, 0, 4, 3, 3, 3, 3, 3, 3, 3, 3, 4, 4, 3, 1, 1, 1,
    1, 1, 1, 1, 1, 2, 2, 2, 3, 3, 3, 9, 9, 9, 9, 15, 15,
16, 16, 16, 16, 16, 17, 12, 12, 12, 13, 13, 13, 7, 7, 7, 6, 11,
11, 11, 11, 17, 17, 17, 17, 17, 12, 12, 18, 18, 18, 23, 22, 22, 21,
21, 16, 15, 15, 16, 16, 16, 16, 12, 12, 12, 12, 19, 19, 1, 1, 1,
    1, 1, 1, 1, 3, 4, 4, 4, 4, 4, 10, 16, 16, 12, 12, 12, 12,
12, 12, 12, 13, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15])
1555]
[1
array([ 0, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15, 12, 12, 12, 12, 12,
    12, 13, 14, 14, 14, 13, 12, 12, 12, 12, 0, 0, 0, 0, 0, 0,
    0, 2, 3, 3, 3, 3, 3, 3, 3, 4, 4, 3, 2, 2, 2, 2, 2,
    3, 3, 3, 9, 9, 15, 15, 15, 15, 13, 12, 12, 12, 17, 17, 17, 16,
16, 16, 16, 16, 17, 12, 12, 13, 13, 7, 7, 7, 7, 8, 9, 10, 10,
10, 10, 10, 16, 16, 16, 16, 16, 16, 16, 16, 16, 16, 15, 15, 15,
14, 13, 13, 12, 12, 18, 18, 1, 1, 1, 1, 1, 1, 1, 3, 3, 3,
    3, 3, 3, 9, 16, 16, 12, 12, 12, 12, 12, 12, 12, 12, 15, 15, 15,
15, 15, 15, 15, 15, 15])
1551]
[1
array([ 0, 23, 21, 21, 15, 15, 15, 15, 15, 15, 15, 15, 15, 14, 14, 13,
    12, 12, 12, 12, 12, 12, 12, 12, 12, 18, 0, 0, 0, 0, 0, 1, 1,
    1, 1, 0, 0, 1, 2, 4, 4, 4, 4, 5, 5, 0, 0, 2, 2, 2,
    2, 2, 3, 3, 9, 9, 9, 9, 9, 9, 9, 16, 16, 16, 16, 16, 16, 16,
16, 17, 17, 17, 17, 17, 16, 16, 16, 17, 12, 12, 12, 12, 12, 12, 12,
18, 18, 18, 18, 18, 23, 23, 18, 18, 19, 19, 1, 1, 1, 1, 1, 1,
    1, 1, 3, 3, 3, 3, 9, 16, 16, 12, 12, 12, 12, 12, 12, 12, 12,

```

```

14, 15, 15, 15, 15, 15, 15, 15, 15])
119]
[1
array([ 0, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15, 14, 13, 13, 12, 12,
       12, 12, 12, 12, 12, 0, 0, 0, 0, 0, 0, 0, 0, 1, 2, 3, 3,
       3, 3, 3, 3, 4, 4, 4, 4, 1, 1, 1, 2, 2, 2, 2, 3, 3,
       3, 3, 3, 9, 9, 15, 15, 15, 15, 15, 12, 12, 12, 12, 12, 6, 6,
       11, 10, 16, 16, 16, 15, 15, 15, 15, 14, 14, 14, 13, 13, 12, 12, 12,
       12, 6, 6, 5, 23, 22, 22, 22, 22, 22, 22, 21, 19, 19, 19, 19, 19,
       19, 1, 1, 1, 1, 2, 3, 3, 4, 4, 22, 22, 18, 19, 1, 1, 1,
       1, 3, 3, 9, 10, 16, 12, 12, 12, 12, 12, 12, 12, 6, 7, 7, 7,
       7, 7, 7, 7, 7, 7])
164]
[1
array([ 0, 0, 3, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15, 14, 15, 15, 15,
       12, 12, 12, 12, 12, 14, 14, 13, 13, 13, 13, 12, 6, 6, 6, 11, 11,
       10, 16, 16, 16, 18, 18, 0, 0, 0, 0, 0, 0, 0, 2, 3, 3, 3,
       3, 1, 1, 1, 2, 1, 2, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3,
       3, 3, 9, 9, 9, 15, 15, 15, 16, 16, 16, 17, 12, 12, 13, 13, 13,
       13, 13, 6, 6, 6, 11, 11, 17, 17, 17, 22, 22, 16, 16, 16, 16, 16,
       15, 13, 13, 12, 13, 13, 19, 19, 19, 19, 1, 1, 1, 1, 0, 0, 0,
       4, 4, 4, 3, 3, 3, 15, 15, 12, 12, 12, 12, 12, 12, 12, 12, 1,
       1, 1, 1, 1, 1, 1, 1, 1])
153]
[2
array([ 0, 23, 21, 22, 22, 22, 22, 16, 15, 15, 15, 15, 15, 15, 15, 14,
       14, 13, 13, 13, 13, 13, 6, 6, 6, 6, 7, 7, 7, 7, 7, 7, 7,
       7, 6, 0, 0, 0, 0, 0, 0, 0, 0, 5, 4, 4, 4, 4, 4, 4, 4,
       4, 4, 21, 21, 21, 21, 21, 22, 22, 22, 22, 22, 21, 20, 20, 14, 13,
       13, 13, 12, 12, 12, 12, 12, 12, 12, 12, 17, 16, 16, 16, 16, 16, 16,
       16, 16])
1623]
[2
array([ 0, 1, 22, 22, 22, 22, 22, 22, 22, 16, 15, 15, 15, 14, 14, 13, 13,
       13, 13, 13, 14, 14, 14, 14, 14, 14, 14, 14, 13, 13, 7, 7, 7, 7,
       7, 0, 0, 0, 0, 0, 5, 5, 5, 5, 5, 5, 5, 4, 4, 4, 4,
       4, 21, 21, 21, 15, 15, 14, 13, 13, 13, 13, 7, 6, 4, 4, 4, 4,
       4, 4, 16, 16, 16, 16, 16, 16, 16, 16, 16, 16])
1576]
[2
array([ 0, 22, 20, 14, 14, 14, 13, 13, 16, 16, 16, 16, 16, 16, 16, 16,
       15, 15, 14, 14, 13, 13, 13, 13, 7, 7, 7, 7, 6, 7, 6, 0, 0,
       0, 0, 0, 0, 0, 5, 5, 4, 4, 4, 4, 4, 4, 4, 22, 22,
       22, 22, 22, 21, 19, 19, 19, 19, 19, 20, 14, 14, 13, 12, 12, 12, 12,
       12, 12, 12, 12, 12, 15, 15, 15, 15, 15, 15, 15, 15])
219]
[2
array([ 0, 23, 22, 22, 22, 21, 15, 15, 15, 15, 15, 15, 15, 14, 13, 13,

```

```

13, 13, 13, 13, 7, 7, 7, 7, 8, 9, 8, 8, 7, 6, 6, 6, 0,
0, 0, 0, 0, 0, 0, 5, 4, 4, 3, 3, 3, 3, 3, 4, 4, 4,
4, 22, 16, 16, 16, 16, 17, 17, 23, 22, 16, 16, 16, 15, 15, 13, 13,
13, 13, 19, 19, 19, 1, 1, 2, 3, 15, 16, 16, 12, 12, 12, 12, 12,
12, 12, 12, 15, 15, 15, 15, 15, 15, 15, 15, 15])
212]
[2
array([ 0, 22, 22, 21, 15, 15, 16, 16, 16, 15, 14, 14, 13, 13, 13, 13, 13,
7, 7, 7, 8, 9, 9, 10, 10, 8, 7, 7, 7, 7, 7, 6, 6, 6,
0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 5, 5, 4, 4, 4, 4,
4, 4, 21, 21, 21, 15, 15, 15, 13, 13, 13, 13, 7, 6, 11, 10, 10,
4, 4, 4, 16, 16, 16, 16, 16, 16, 16, 16, 16, 16])
1595]
[2
array([ 0, 16, 17, 19, 19, 13, 14, 14, 14, 14, 15, 16, 16, 16, 16, 16, 16,
16, 16, 14, 14, 14, 14, 14, 14, 14, 14, 14, 13, 13, 7, 7, 7, 7,
7, 7, 7, 7, 0, 0, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5, 4,
4, 4, 4, 4, 22, 22, 22, 22, 22, 22, 22, 22, 21, 20, 19, 19,
13, 13, 13, 7, 7, 11, 11, 11, 11, 10, 10, 10, 16, 15, 15, 15, 15,
15, 15, 15, 15, 15])
1645]
[2
array([ 0, 22, 21, 14, 14, 14, 15, 15, 15, 15, 15, 13, 13, 13, 13, 13, 13,
13, 13, 13, 14, 14, 14, 8, 8, 7, 7, 7, 7, 7, 7, 6, 0, 0,
5, 5, 5, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 3, 21, 21,
21, 21, 15, 15, 15, 15, 15, 15, 15, 14, 13, 13, 13, 13, 13, 13, 13, 1,
1, 4, 4, 4, 4, 4, 4, 4, 4, 16, 16, 16, 16, 16, 16, 16, 16, 16,
16])
188]
[2
array([ 0, 22, 18, 19, 20, 21, 21, 22, 22, 16, 16, 16, 15, 15, 15, 14, 14,
13, 13, 13, 13, 7, 6, 6, 11, 10, 10, 9, 9, 9, 8, 7, 7, 7,
7, 7, 1, 0, 0, 0, 0, 5, 4, 4, 4, 4, 4, 4, 4, 4, 22, 22,
22, 22, 22, 21, 21, 21, 14, 14, 14, 13, 13, 13, 13, 13, 13, 7, 6,
11, 10, 10, 10, 10, 10, 10, 16, 15, 15, 15, 15, 15, 15, 15, 15, 15])
182]
[2
array([ 0, 23, 20, 21, 15, 15, 15, 15, 15, 15, 15, 15, 14, 14, 13, 12, 12,
12, 13, 14, 14, 14, 14, 14, 14, 14, 13, 13, 7, 7, 7, 7, 6, 6,
0, 0, 0, 0, 0, 5, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4,
4, 4, 22, 23, 23, 23, 23, 23, 20, 21, 21, 21, 21, 21, 15, 16, 16,
16, 13, 13, 13, 13, 1, 1, 4, 4, 4, 4, 4, 4, 4, 4, 16, 16, 16,
16, 16, 16, 16, 16, 16])
190]
[2
array([ 0, 0, 21, 21, 15, 16, 16, 16, 16, 15, 15, 15, 15, 15, 15, 15, 15,
15, 14, 14, 13, 13, 13, 13, 13, 7, 7, 7, 6, 6, 6, 0, 0, 0,
0, 0, 0, 5, 4, 4, 5, 5, 5, 5, 4, 4, 4, 4, 4, 22, 22,

```



```

        21, 21, 15, 14, 13, 13, 13, 13, 6, 6, 11, 11, 10, 10, 10, 16, 16,
        16, 16, 16, 16, 16, 16, 16, 16])
1588]
[2
array([ 0, 0, 22, 22, 21, 21, 20, 14, 15, 16, 16, 16, 16, 16, 16, 15,
        14, 14, 14, 13, 13, 13, 14, 15, 15, 15, 15, 13, 13, 13, 13, 7, 7,
         1, 1, 1, 0, 0, 4, 4, 4, 4, 4, 4, 4, 4, 4, 5, 0, 0,
         0, 0, 0, 0, 0, 0, 0, 0, 3, 3, 3, 3, 4, 4, 4, 16, 16,
        16, 16, 16, 16, 12, 12, 13, 13, 13, 13, 13, 13, 13, 13, 13, 7,
         1, 4, 4, 4, 4, 4, 4, 4, 10, 10, 10, 4, 1, 1, 1, 1, 1, 1,
         1, 1, 1])
211]
[2
array([ 0, 22, 22, 22, 22, 22, 22, 21, 15, 15, 15, 14, 14, 14, 14, 14,
        13, 13, 13, 13, 13, 13, 13, 14, 14, 15, 15, 14, 14, 14, 13, 7, 7,
         7, 6, 6, 0, 0, 0, 0, 0, 0, 4, 4, 4, 4, 4, 5, 5, 5,
         5, 4, 4, 4, 4, 4, 22, 21, 21, 21, 21, 21, 21, 15, 15, 15, 15,
        15, 15, 15, 13, 13, 13, 13, 13, 13, 1, 4, 4, 4, 4, 4, 4, 4,
        16, 15, 15, 15, 15, 15, 15, 15, 15])
1651]
[2
array([ 0, 23, 22, 21, 15, 15, 15, 15, 15, 15, 15, 15, 14, 14, 14, 15,
        15, 15, 15, 15, 14, 14, 14, 13, 13, 13, 13, 7, 7, 6, 6, 0, 0,
         0, 0, 0, 0, 5, 5, 4, 4, 5, 5, 5, 4, 4, 4, 4, 4, 3,
        21, 21, 21, 15, 15, 14, 13, 13, 13, 13, 6, 6, 11, 11, 10, 10, 10,
        16, 16, 16, 16, 16, 16, 16, 16, 16])
1577]
[2
array([ 0, 22, 19, 19, 13, 14, 15, 15, 15, 15, 15, 15, 14, 13, 13, 13, 13,
        13, 15, 15, 15, 15, 15, 13, 13, 13, 7, 7, 7, 7, 7, 1, 1, 1,
         1, 3, 9, 9, 9, 10, 10, 10, 10, 11, 11, 11, 5, 5, 0, 0, 0,
         0, 0, 1, 1, 1, 1, 1, 2, 3, 3, 3, 3, 3, 3, 21, 15, 15, 16,
        16, 12, 13, 13, 13, 19, 1, 3, 3, 3, 3, 3, 3, 16, 16, 16, 16,
        16, 16, 16, 16, 16, 16])
1657]
[2
array([ 0, 22, 19, 19, 20, 15, 16, 16, 16, 16, 16, 16, 16, 16, 15, 15, 15,
        14, 14, 13, 13, 13, 13, 13, 13, 13, 7, 7, 7, 1, 1, 1, 1, 1,
         3, 3, 3, 9, 9, 10, 10, 10, 11, 6, 0, 0, 0, 0, 0, 0, 0,
         0, 0, 4, 4, 4, 3, 3, 3, 21, 21, 15, 15, 16, 15, 13, 13, 13,
        13, 13, 13, 1, 2, 4, 4, 4, 4, 4, 16, 16, 16, 16, 16, 16,
        16, 16, 16])
194]
[2
array([ 0, 23, 21, 20, 20, 21, 21, 15, 15, 15, 14, 14, 14, 14, 13, 13, 14,
        15, 15, 15, 15, 15, 15, 15, 14, 13, 13, 13, 6, 6, 6, 6, 0, 0,
         0, 0, 0, 5, 4, 4, 4, 4, 4, 4, 5, 5, 5, 5, 5, 4, 4,
         4, 4, 4, 4, 21, 21, 21, 21, 21, 15, 15, 15, 15, 13, 13, 13, 13,

```

```

    7, 0, 5, 4, 4, 4, 4, 4, 4, 16, 15, 15, 15, 15, 15, 15, 15,
    15, 15])
1638]
[2
array([ 0, 23, 21, 21, 15, 16, 16, 16, 16, 16, 16, 16, 16, 13, 13, 13, 13,
    13, 13, 13, 13, 13, 13, 13, 7, 7, 7, 7, 7, 7, 7, 0, 0, 5,
    4, 4, 4, 4, 4, 4, 4, 4, 4, 5, 5, 0, 0, 1, 1, 1, 4, 4,
    4, 4, 4, 22, 22, 16, 16, 16, 15, 13, 13, 13, 13, 7, 7, 5, 4,
    4, 4, 4, 4, 4, 16, 16, 16, 16, 16, 16, 16, 16, 16, 16])
199]
[3
array([ 0, 23, 21, 21, 15, 14, 13, 13, 13, 14, 14, 15, 15, 15, 16, 16, 17,
    12, 12, 13, 13, 13, 13, 7, 7, 7, 7, 6, 0, 0, 0, 0, 0, 0,
    5, 5, 4, 5, 5, 5, 5, 5, 4, 4, 4, 4, 4, 22, 22, 21, 21,
    21, 21, 20, 20, 20, 20, 20, 21, 15, 15, 15, 15, 15, 15, 15, 15, 15,
    16, 17, 12, 12, 12, 12, 12, 12, 12, 12, 12, 12, 6, 6, 0, 0, 0,
    0, 0, 0, 0, 0, 0, 3, 3, 3, 3, 3, 3, 3, 3, 21, 15,
    15, 14, 13, 13, 12, 12, 12, 12, 6, 11, 11, 11, 16, 15, 15, 15, 15,
    15, 15, 15, 15, 15])
1717]
[3
array([ 0, 23, 22, 22, 22, 22, 22, 22, 21, 21, 15, 15, 15, 15, 14, 14, 14,
    14, 13, 13, 12, 12, 6, 6, 6, 6, 6, 0, 0, 0, 0, 5, 5, 0,
    0, 0, 0, 0, 0, 4, 3, 3, 3, 3, 3, 3, 3, 21, 22, 22, 22,
    21, 21, 21, 15, 15, 15, 15, 15, 15, 14, 14, 13, 12, 12, 12, 12, 13,
    12, 12, 12, 12, 12, 12, 12, 12, 12, 12, 12, 18, 0, 0, 0, 0, 0,
    0, 0, 0, 0, 0, 4, 4, 4, 4, 3, 3, 3, 21, 21, 15, 14, 13,
    12, 12, 12, 12, 12, 12, 12, 12, 17, 15, 15, 15, 15, 15, 15, 15,
    15])
290]
[3
array([ 0, 23, 21, 20, 20, 14, 15, 15, 14, 14, 14, 14, 14, 14, 13, 13, 7,
    6, 6, 6, 6, 6, 6, 6, 6, 0, 0, 0, 0, 0, 0, 0, 0, 0,
    5, 5, 5, 4, 4, 3, 3, 3, 3, 3, 3, 21, 21, 21, 21, 15, 15, 15,
    15, 15, 15, 15, 15, 15, 15, 15, 12, 12, 12, 12, 12, 12, 12, 12, 6,
    6, 6, 0, 0, 0, 0, 0, 0, 0, 0, 0, 5, 4, 4, 4, 4, 4,
    3, 3, 3, 21, 21, 15, 14, 13, 13, 12, 12, 12, 12, 12, 12, 12, 17,
    15, 15, 15, 15, 15, 15, 15, 15, 15])
271]
[3
array([ 0, 16, 16, 16, 23, 23, 23, 22, 22, 22, 22, 21, 15, 14, 14, 14, 14,
    14, 14, 14, 14, 14, 13, 13, 6, 6, 6, 6, 0, 0, 0, 0, 0, 5,
    5, 5, 5, 5, 5, 5, 4, 4, 4, 3, 3, 3, 21, 21, 21, 22,
    18, 18, 19, 20, 21, 21, 15, 15, 15, 15, 15, 15, 15, 15, 13, 12,
    12, 12, 12, 12, 12, 12, 12, 12, 12, 12, 0, 0, 0, 0, 0, 0,
    0, 0, 0, 0, 5, 4, 4, 4, 3, 3, 3, 3, 21, 21, 15, 15, 13,
    13, 13, 6, 6, 11, 10, 10, 10, 4, 10, 16, 15, 15, 15, 15, 15,
    15, 15, 15])

```

284]

[3

```
array([ 0, 23, 22, 22, 23, 18, 23, 22, 21, 21, 21, 15, 15, 15, 15, 15, 15,
       14, 14, 13, 13, 13, 7, 7, 7, 6, 6, 0, 0, 0, 0, 0, 5, 5,
       5, 4, 4, 4, 4, 4, 3, 3, 3, 21, 21, 1, 1, 1, 1, 1, 3,
       3, 3, 15, 15, 15, 15, 15, 15, 15, 15, 15, 14, 13, 13, 13, 13, 12, 12,
       12, 12, 6, 6, 6, 6, 0, 5, 4, 4, 5, 5, 0, 0, 0, 0, 0,
       0, 0, 0, 5, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 21, 21, 21,
       21, 14, 14, 13, 12, 12, 12, 12, 12, 12, 12, 12, 17, 15, 15, 15, 15,
       15, 15, 15, 15, 15])
```

228]

[3

```
array([ 0, 23, 21, 14, 14, 14, 14, 14, 13, 13, 13, 13, 13, 13, 13, 13, 13,
       7, 7, 7, 7, 6, 6, 0, 0, 0, 0, 5, 5, 5, 4, 4, 4, 4,
       4, 4, 3, 3, 3, 3, 3, 3, 2, 1, 1, 1, 2, 3, 3, 15, 15,
       15, 15, 15, 15, 15, 15, 16, 12, 12, 12, 12, 12, 12, 12, 12, 12, 6,
       6, 6, 10, 10, 10, 6, 6, 0, 0, 0, 0, 0, 0, 0, 5, 5,
       5, 4, 4, 3, 2, 2, 2, 2, 3, 3, 3, 3, 3, 3, 21, 15, 15,
       14, 12, 12, 12, 12, 12, 12, 12, 12, 12, 15, 15, 15, 15, 15, 15, 15,
       15, 15])
```

249]

[3

```
array([ 0, 23, 21, 21, 21, 21, 15, 15, 15, 15, 15, 15, 15, 15, 14, 14, 14,
       13, 13, 12, 6, 6, 6, 6, 6, 0, 0, 0, 0, 0, 0, 0, 0,
       0, 5, 4, 3, 3, 3, 3, 3, 3, 3, 3, 4, 22, 22, 22, 22, 21,
       21, 21, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15, 17, 12, 12, 12, 12,
       12, 12, 12, 12, 6, 6, 0, 0, 0, 0, 0, 0, 0, 0, 5, 4,
       4, 4, 4, 3, 3, 3, 3, 21, 15, 15, 14, 12, 12, 12, 12, 12,
       12, 12, 12, 12, 15, 15, 15, 15, 15, 15, 15, 15, 15])
```

302]

[3

```
array([ 0, 23, 21, 20, 14, 14, 14, 14, 15, 15, 15, 15, 15, 15, 15, 15, 14,
       13, 13, 12, 6, 6, 6, 6, 0, 0, 0, 0, 0, 0, 5, 5, 5, 4,
       4, 4, 4, 4, 3, 3, 3, 3, 21, 22, 22, 22, 23, 18, 19, 20,
       20, 20, 21, 15, 15, 15, 15, 15, 15, 15, 15, 16, 12, 12, 12, 13, 13, 13,
       13, 13, 12, 12, 12, 12, 6, 6, 6, 6, 6, 6, 0, 0, 0, 0, 0,
       0, 0, 0, 0, 0, 4, 3, 3, 3, 3, 3, 3, 3, 21, 15, 15, 13,
       12, 12, 12, 12, 12, 12, 12, 12, 12, 15, 15, 15, 15, 15, 15, 15, 15,
       15])
```

1697]

[3

```
array([ 0, 22, 22, 22, 23, 18, 19, 19, 18, 22, 22, 22, 22, 21, 21, 15, 15,
       15, 15, 14, 14, 14, 14, 14, 14, 13, 13, 7, 6, 6, 6, 6, 0, 0,
       0, 0, 5, 5, 5, 5, 5, 5, 4, 4, 4, 3, 3, 3, 3, 3, 3,
       3, 1, 1, 2, 2, 3, 3, 21, 15, 15, 15, 15, 15, 15, 15, 15, 14,
       13, 13, 13, 12, 12, 12, 12, 12, 6, 6, 6, 11, 5, 23, 23, 18, 0,
       0, 1, 1, 1, 1, 1, 0, 0, 4, 4, 4, 4, 4, 4, 4, 4, 4,
       21, 21, 15, 14, 13, 13, 13, 12, 12, 12, 6, 11, 11, 11, 16, 16, 15,
```

```

15, 15, 15, 15, 15, 15, 15])
236]
[3
array([ 0, 23, 20, 20, 21, 21, 22, 16, 16, 15, 15, 15, 15, 15, 14, 14, 14,
       14, 14, 14, 14, 13, 13, 13, 7, 6, 6, 6, 0, 0, 0, 0, 0, 0,
       0, 5, 5, 5, 5, 5, 4, 4, 3, 3, 3, 3, 3, 3, 3, 3, 21, 21,
       21, 15, 15, 15, 15, 15, 15, 15, 16, 12, 12, 12, 12, 12, 12, 13, 13, 13,
       13, 12, 12, 12, 12, 12, 12, 6, 6, 0, 0, 0, 0, 0, 0, 0, 0, 0,
       5, 4, 4, 4, 4, 3, 3, 3, 3, 3, 3, 3, 3, 21, 15, 15, 14, 12,
       12, 12, 12, 12, 12, 12, 12, 12, 15, 15, 15, 15, 15, 15, 15, 15, 15])
1672]
[3
array([ 0, 0, 22, 22, 22, 22, 19, 19, 19, 20, 21, 21, 15, 15, 15, 15, 15,
       15, 15, 14, 14, 13, 13, 13, 7, 6, 6, 6, 0, 0, 0, 0, 0, 0,
       5, 5, 5, 4, 4, 3, 3, 3, 3, 3, 3, 21, 21, 21, 22, 18, 19, 20,
       21, 21, 21, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15, 14, 13, 13, 13,
       13, 13, 13, 12, 6, 6, 6, 0, 0, 5, 4, 4, 4, 4, 10, 10, 0, 0,
       0, 0, 0, 0, 0, 0, 0, 5, 4, 3, 3, 4, 4, 4, 3, 3, 3,
       21, 21, 21, 15, 14, 13, 12, 12, 12, 12, 12, 12, 12, 12, 17, 15, 15,
       15, 15, 15, 15, 15, 15])
254]
[3
array([ 0, 23, 22, 21, 21, 15, 14, 14, 14, 14, 14, 14, 14, 14, 14, 14,
       14, 13, 13, 6, 6, 6, 6, 0, 0, 0, 0, 0, 0, 5, 5, 4, 4,
       4, 4, 4, 4, 4, 3, 3, 0, 0, 0, 0, 0, 1, 3, 3, 3, 21,
       15, 15, 15, 15, 15, 15, 15, 15, 15, 16, 12, 12, 12, 13, 13, 12, 12,
       12, 6, 6, 6, 11, 11, 10, 10, 10, 11, 0, 0, 0, 0, 0, 0, 0,
       0, 0, 5, 4, 4, 3, 3, 3, 3, 4, 4, 4, 21, 21, 21, 15, 14,
       13, 13, 13, 12, 12, 6, 11, 11, 11, 11, 11, 16, 15, 15, 15, 15, 15,
       15, 15, 15, 15])
246]
[3
array([ 0, 23, 22, 22, 22, 20, 20, 20, 21, 15, 15, 15, 15, 15, 15, 14, 14,
       13, 13, 13, 13, 7, 7, 6, 6, 6, 6, 6, 6, 6, 0, 0, 0, 0,
       0, 0, 0, 0, 5, 5, 5, 5, 4, 4, 3, 3, 3, 3, 3, 3, 2, 1,
       1, 1, 0, 4, 3, 3, 21, 21, 15, 15, 15, 15, 15, 15, 15, 15, 13,
       13, 13, 13, 13, 13, 12, 12, 6, 6, 6, 6, 0, 5, 5, 5, 5,
       0, 0, 0, 0, 0, 0, 0, 0, 5, 5, 4, 4, 4, 4, 3, 3, 3,
       3, 3, 3, 21, 21, 21, 15, 14, 13, 12, 12, 12, 12, 12, 12, 12, 12,
       12, 15, 15, 15, 15, 15, 15, 15, 15, 15])
260]
[3
array([ 0, 23, 20, 20, 14, 15, 15, 15, 15, 15, 15, 15, 15, 15, 14, 14, 13,
       13, 13, 13, 7, 7, 7, 6, 6, 6, 0, 0, 0, 0, 0, 0, 5, 5,
       5, 5, 5, 5, 4, 4, 3, 3, 3, 3, 3, 21, 21, 21, 15, 15,
       15, 15, 15, 15, 14, 14, 13, 12, 12, 12, 12, 13, 13, 13, 14, 13,
       13, 13, 12, 12, 12, 12, 12, 6, 6, 6, 0, 0, 0, 0, 0, 0, 5,
       5, 4, 4, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 15, 15, 15, 12,

```

```

12, 12, 12, 12, 12, 12, 12, 12, 15, 15, 15, 15, 15, 15, 15, 15, 15])
1673]
[4
array([ 0,  8, 15, 15,  8,  7,  7,  7,  7,  7,  6,  0,  0,  5,  5,  5,  5,
        5,  4,  4,  4,  4, 22, 22, 21, 21, 20, 20, 20, 21, 21, 21, 15, 15,
       15, 15, 15, 15, 15, 15, 14, 14, 14, 13, 13, 13, 13, 13, 13, 13, 13,
       13,  7,  7,  7,  6,  6,  6,  6,  6,  6,  7,  7,  7,  7,  6,  0,  0,  0,
        0,  0,  0,  5,  5,  5,  4,  4,  4,  4,  4,  4, 22, 22, 22, 21, 21,
       21, 14, 13, 13, 13, 13, 12,  6, 11, 11, 11, 11, 11, 16, 15, 15, 15,
       15, 15, 15, 15, 15, 15])
379]
[4
array([ 0, 15,  7,  7,  7,  7,  8,  7,  7,  7,  6,  6,  6,  0,  5,  5,  5,
        5,  5,  5,  5,  5,  4, 22, 22, 22, 22, 21, 21, 21, 21, 21, 21, 21,
       15, 15, 15, 15, 15, 14, 14, 14, 14, 14, 14, 14, 13, 13, 13, 13, 13,
       13,  7,  7,  6,  6,  6,  6,  6,  6,  6,  6,  0,  0,  0,  0,  0,  0,  0,
        0,  0,  0,  0,  5,  4,  4,  4,  4,  4,  4,  4, 22, 22, 22, 21, 21, 21,
       15, 14, 13, 13, 13, 13, 13,  6,  6, 11, 11, 11, 11, 11, 11, 16, 15,
       15, 15, 15, 15, 15, 15, 15, 15])
354]
[4
array([ 0,  8,  7,  7,  6,  6,  6,  6,  0,  0,  0,  0,  0,  0,  0,  0,  0,
        5,  4,  4,  4,  4,  4,  4,  4, 22, 21, 21, 21, 21, 15, 15, 16, 16,
       16, 17, 12, 12, 13, 13, 13, 13, 13, 13, 13, 13, 13, 13, 13,  7,  7,  7,
        7,  8,  8,  8,  8,  8,  8,  7,  6,  6,  6,  6,  6,  6,  6,  0,  0,
        0,  0,  0,  5,  5,  5,  5,  4,  4,  4,  4,  4,  4, 22, 22, 22,
       22, 22, 21, 20, 20, 14, 14, 13,  7,  6, 11, 11, 11, 11, 11, 11, 17,
       15, 15, 15, 15, 15, 15, 15, 15])
356]
[4
array([ 0, 16,  1,  1,  1,  1,  2,  2,  1,  1,  1,  1,  1,  1,  0,  4,  4,
        4,  4,  4,  4,  4,  4,  4,  4, 22, 22, 22, 21, 21, 15, 15, 15, 15, 14,
       13, 12, 12, 13, 14, 14, 14, 14, 14, 14, 14, 14, 14, 13, 13, 13, 13,
       13, 12,  6,  6,  6,  6,  6,  6,  0,  0,  0,  0,  0,  5,  5,  4,  5,
        5,  5,  5,  5,  5,  5,  5,  5,  4,  4,  4,  4, 21, 21, 21, 21, 15,
       15, 15, 13, 13, 13, 13,  7,  6, 11, 11, 10, 10, 10, 10, 10, 16, 15,
       15, 15, 15, 15, 15, 15, 15, 15])
1755]
[4
array([ 0,  8,  6,  7,  7,  7,  7,  7,  7,  1,  0,  0,  0,  0,  5,  5,  5,
        4,  4,  4,  4,  4, 22, 22, 22, 22, 21, 21, 15, 15, 15, 15, 14, 13,
       13, 13, 13, 13, 14, 14, 14, 14, 14, 13, 14, 14, 14, 15, 15, 15, 15,
       12, 12, 12,  6,  6,  6,  0,  0,  0,  0,  0,  0,  0,  2,  2,  2,  1,
        1,  1,  1,  0,  0,  5,  4,  4,  4,  4,  4, 22, 16, 15, 15, 13, 13,
       13, 13, 13, 12, 12,  6, 11, 11, 10, 16, 16, 16, 16, 16, 16, 16, 16,
       16, 16])
308]
[4

```

```
array([ 0, 15, 7, 7, 1, 1, 1, 1, 1, 0, 0, 0, 0, 0, 0, 0, 4,
        4, 4, 4, 4, 4, 4, 4, 22, 22, 22, 22, 22, 22, 21, 21, 21, 21,
        21, 21, 15, 15, 15, 15, 15, 15, 14, 14, 14, 14, 14, 13, 13, 13, 12, 12,
        12, 12, 12, 6, 6, 6, 7, 7, 8, 8, 8, 8, 8, 7, 7, 7, 6,
        6, 6, 0, 0, 5, 5, 5, 5, 5, 5, 5, 4, 4, 4, 4, 4, 4,
        21, 21, 21, 21, 21, 15, 15, 14, 13, 13, 13, 13, 6, 6, 11, 4, 4,
        4, 4, 4, 16, 15, 15, 15, 15, 15, 15, 15, 15, 15])
```

320]

[4

```
array([ 0, 16, 1, 1, 1, 7, 7, 7, 7, 7, 1, 1, 1, 0, 0, 0, 5,
        5, 4, 4, 4, 4, 4, 22, 22, 22, 21, 21, 21, 21, 15, 15, 15, 15,
        14, 14, 14, 14, 14, 14, 14, 14, 15, 15, 14, 14, 13, 13, 13, 12, 12,
        6, 6, 6, 6, 6, 0, 0, 0, 0, 0, 0, 0, 0, 5, 5, 5, 5,
        5, 5, 5, 5, 5, 5, 5, 4, 4, 4, 4, 21, 21, 21, 15, 15, 15,
        13, 13, 13, 13, 7, 6, 11, 10, 10, 10, 10, 10, 10, 16, 15, 15, 15,
        15, 15, 15, 15, 15, 15])
```

1756]

[4

```
array([ 0, 16, 13, 13, 13, 7, 7, 7, 7, 7, 7, 7, 6, 0, 0, 0, 0,
        5, 5, 5, 4, 4, 4, 4, 22, 22, 21, 21, 21, 21, 15, 15, 14, 13,
        13, 14, 14, 14, 14, 15, 15, 15, 14, 14, 14, 13, 13, 13, 13, 6, 6,
        6, 6, 6, 6, 6, 0, 0, 0, 0, 5, 5, 5, 5, 5, 5, 5, 4,
        2, 1, 1, 0, 4, 4, 4, 3, 3, 21, 21, 15, 14, 13, 12, 12, 12,
        12, 12, 12, 12, 12, 16, 16, 16, 16, 16, 16, 16, 16, 16])
```

1764]

[4

```
array([ 0, 15, 13, 7, 7, 7, 7, 6, 6, 6, 6, 0, 0, 0, 5, 5, 5,
        5, 5, 5, 5, 4, 4, 4, 4, 4, 22, 22, 22, 22, 21, 21, 21, 21,
        21, 21, 21, 21, 15, 15, 15, 15, 14, 14, 14, 14, 13, 13, 13, 13, 13,
        14, 14, 17, 12, 12, 12, 6, 6, 6, 6, 6, 0, 0, 0, 0, 5, 5,
        4, 4, 4, 4, 4, 4, 4, 3, 3, 3, 4, 4, 4, 4, 4, 22, 22,
        22, 22, 22, 21, 21, 20, 14, 13, 13, 13, 6, 11, 11, 11, 11, 11, 11,
        11, 16, 15, 15, 15, 15, 15, 15, 15, 15, 15])
```

392]

[4

```
array([ 0, 15, 7, 6, 6, 6, 0, 0, 0, 0, 0, 0, 0, 5, 4, 4, 4,
        4, 4, 4, 22, 22, 21, 21, 21, 21, 15, 15, 15, 16, 16, 16, 15, 15,
        15, 15, 14, 14, 14, 13, 13, 13, 13, 13, 13, 7, 7, 7, 7, 7, 6,
        6, 6, 6, 6, 6, 6, 0, 0, 0, 0, 0, 0, 5, 5, 5, 4, 4,
        4, 4, 4, 4, 4, 4, 22, 22, 21, 21, 20, 14, 13, 13, 13, 12, 12,
        12, 12, 12, 12, 17, 16, 16, 16, 16, 16, 16, 16, 16, 16])
```

352]

[4

```
array([ 0, 16, 13, 13, 7, 1, 1, 1, 1, 1, 8, 8, 8, 7, 7, 7, 7,
        6, 6, 0, 5, 5, 5, 5, 4, 4, 4, 22, 22, 22, 22, 21, 21, 21,
        21, 21, 22, 22, 22, 21, 21, 15, 14, 14, 14, 14, 14, 14, 14, 15,
        15, 15, 15, 14, 14, 13, 13, 13, 13, 7, 7, 7, 7, 6, 6, 6, 6,
        0, 0, 0, 0, 0, 5, 5, 4, 4, 4, 4, 4, 4, 4, 4, 4, 3,
```

```

        3, 3, 21, 21, 15, 15, 14, 13, 12, 12, 12, 12, 12, 12, 12, 12, 16,
        16, 16, 16, 16, 16, 16, 16, 16])
1760]
[4
array([ 0, 8, 11, 23, 18, 1, 1, 1, 1, 0, 0, 0, 0, 1, 1, 5, 4,
        4, 4, 4, 4, 22, 22, 22, 22, 22, 16, 15, 15, 15, 15, 15, 15, 14,
        14, 14, 14, 13, 13, 13, 13, 13, 7, 7, 6, 6, 6, 6, 6, 6,
        0, 0, 0, 0, 0, 0, 0, 0, 5, 5, 5, 5, 5, 5, 4, 4, 4,
        4, 4, 3, 21, 21, 21, 14, 13, 13, 13, 12, 12, 12, 12, 12, 12, 12,
        16, 16, 16, 16, 16, 16, 16, 16, 16, 16])
1737]
[4
array([ 0, 16, 13, 7, 7, 7, 7, 7, 7, 7, 7, 7, 7, 7, 0, 0, 5, 5,
        4, 4, 4, 4, 4, 22, 22, 22, 22, 22, 18, 18, 19, 19, 21, 21, 21,
        21, 15, 15, 15, 15, 15, 15, 14, 14, 14, 14, 14, 14, 14, 14, 13, 13,
        13, 13, 12, 12, 6, 6, 6, 6, 6, 0, 0, 0, 0, 0, 5, 5, 4,
        4, 4, 4, 4, 4, 5, 0, 0, 0, 0, 0, 5, 4, 4, 4, 3,
        3, 21, 21, 21, 15, 15, 14, 13, 13, 13, 13, 12, 6, 6, 11, 11, 11,
        11, 16, 15, 15, 15, 15, 15, 15, 15, 15, 15])
1749]
[4
array([ 0, 16, 14, 14, 14, 14, 14, 14, 14, 14, 8, 7, 7, 6, 6, 6, 6, 6,
        0, 0, 0, 0, 0, 0, 0, 1, 1, 1, 1, 1, 1, 1, 1, 3, 4,
        4, 4, 4, 4, 4, 22, 22, 22, 22, 22, 22, 16, 15, 14, 13, 13,
        13, 13, 13, 13, 14, 14, 14, 14, 14, 14, 14, 14, 14, 14, 13, 13,
        13, 13, 12, 12, 12, 6, 6, 6, 7, 7, 7, 7, 7, 7, 7, 7, 6,
        6, 6, 0, 0, 0, 0, 0, 5, 5, 4, 4, 4, 4, 4, 4, 4, 4,
        3, 3, 21, 21, 21, 22, 22, 22, 21, 15, 14, 13, 13, 13, 13, 6, 6,
        11, 11, 11, 10, 10, 10, 16, 15, 15, 15, 15, 15, 15, 15, 15, 15])
332]
[4
array([ 0, 15, 6, 6, 0, 0, 0, 0, 1, 1, 1, 1, 1, 0, 0, 5, 4,
        4, 4, 4, 4, 4, 22, 22, 22, 22, 22, 22, 21, 21, 15, 15, 15,
        15, 15, 15, 15, 15, 14, 14, 14, 14, 13, 13, 13, 13, 13, 13,
        6, 6, 6, 6, 10, 9, 9, 8, 8, 7, 7, 7, 7, 7, 7, 6, 6,
        0, 0, 0, 0, 0, 5, 5, 5, 4, 4, 4, 4, 4, 4, 4, 4, 22,
        22, 22, 22, 21, 21, 21, 21, 21, 14, 14, 13, 13, 13, 13, 6, 6, 11,
        11, 11, 11, 11, 16, 15, 15, 15, 15, 15, 15, 15, 15, 15])
365]
[4
array([ 0, 15, 15, 15, 14, 14, 14, 8, 8, 7, 7, 6, 6, 6, 0, 0, 0,
        0, 5, 5, 5, 5, 4, 4, 4, 3, 3, 3, 3, 3, 21, 22, 22, 22,
        22, 22, 16, 16, 16, 16, 16, 16, 16, 16, 15, 14, 14, 14, 14, 14,
        14, 14, 13, 13, 13, 13, 12, 6, 6, 6, 6, 6, 6, 7, 9, 9,
        9, 9, 9, 8, 7, 7, 7, 6, 0, 0, 0, 0, 0, 0, 5, 5, 4,
        4, 4, 4, 4, 4, 4, 21, 21, 21, 21, 21, 21, 21, 15, 15, 14,
        13, 13, 13, 13, 6, 6, 11, 11, 10, 10, 10, 10, 16, 15, 15, 15, 15,
        15, 15, 15, 15, 15])

```

```

331]
[4
array([ 0, 16,  7,  1,  1,  9,  9,  9,  9,  8,  7,  6,  6,  6,  0,  0,  0,
        0,  0,  0,  0,  5,  4,  4,  4,  4,  4, 22, 22, 22, 22, 15, 15, 15,
       13, 12, 12, 12, 12, 12, 16, 15, 15, 15, 15, 15, 15, 14, 14, 14, 13,
       13, 13,  7,  7,  7,  7,  6,  6, 10, 10, 10, 11, 11,  6,  6,  6,  6,
        6,  0,  0,  0,  0,  0,  0,  0,  0,  0,  0,  0,  0,  5,  4,  4,  4,
        4,  4,  4, 22, 22, 22, 21, 15, 15, 13, 13, 13, 13, 13,  7, 11, 11,
       10, 10, 10, 10, 10, 16, 15, 15, 15, 15, 15, 15, 15, 15, 15])

381]
[4
array([ 0, 15, 13,  7,  7,  7,  7,  7,  7,  6,  6, 11,  5,  5,  5,  5,  5,
        5,  5,  5,  0,  0,  0,  0,  4,  4,  3,  3,  3,  3,  3, 21, 15,
       15, 15, 15, 15, 16, 16, 17, 12, 12, 12, 13, 13, 13, 13, 13, 13, 13,
       13, 13, 13, 13, 13, 13, 13, 13,  7,  7,  7,  7,  7,  6,  6,  0,  0,
        5,  4,  4,  4,  4,  4,  5,  5,  0,  0,  0,  5,  5,  5,  5,  5,  5,
        4,  4,  4,  4, 21, 21, 21, 21, 21, 15, 15, 15, 15, 13, 13, 13, 13,
       13,  7,  6, 11, 10, 10, 10, 10, 10, 10, 16, 15, 15, 15, 15, 15, 15,
       15, 15, 15])

388]
[4
array([ 0, 15, 12, 12, 12, 15, 14, 13, 13,  7,  7,  6,  0,  0,  0,  0,  0,
        0,  0,  5,  4,  4,  4,  4,  4,  4,  4, 22, 22, 22, 21, 20, 20, 20,
       21, 21, 15, 15, 15, 15, 16, 16, 16, 16, 16, 17, 12, 12, 13, 13, 14,
       14, 13, 13, 13, 13, 13, 13, 13, 13, 13,  7,  7,  7,  7,  7,  7,  7,
        7,  6,  6,  6,  6,  6,  0,  0,  0,  5,  5,  5,  5,  5,  4,  4,  4,
        4,  4,  4, 22, 22, 22, 21, 21, 21, 21, 15, 14, 13, 13, 13, 13, 13,
       13,  6,  6, 11, 10, 10, 10, 10, 10, 16, 15, 15, 15, 15, 15, 15, 15,
       15, 15])

408]
[4
array([ 0, 15,  7,  7,  7,  7,  6,  0,  0,  0,  0,  0,  0,  5,  5,  5,  4,
        4,  4,  4,  4, 22, 21, 21, 21, 21, 21, 21, 15, 15, 15, 15, 15, 16,
       16, 17, 17, 12, 13, 14, 14, 14, 14, 14, 14, 14, 14, 14, 14, 14, 14,
       14, 13, 13, 12,  6,  6,  6,  6,  0,  0,  0,  0,  0,  5,  4,  4,  4,
        5,  0,  0,  0,  0,  0,  4,  4,  4,  4,  4, 22, 22, 21, 15, 15, 14,
       13, 13, 13, 13,  6,  6,  4,  4,  4,  4,  4,  4, 16, 15, 15, 15, 15,
       15, 15, 15, 15, 15])

312]
[5
array([ 0, 23, 22, 22, 21, 15, 15, 15, 15, 15, 15, 15, 15, 14, 14, 14,
       13, 13, 13, 13, 13,  7,  7,  7,  7,  7,  0,  0,  0,  0,  5,  5,  4,
        4,  4,  4,  4,  5,  5,  4,  4,  4,  3,  3,  3, 21, 21, 21, 21, 15,
       15, 15, 15, 15, 14, 14, 14, 13, 13, 13, 13, 12, 12, 17, 16, 15, 15,
       14, 13, 12, 12, 12,  6,  6,  6, 11, 11, 16, 16, 15, 15, 15, 15, 15,
       16, 16, 16, 17, 17, 12, 12, 12, 12, 18, 18, 18, 18, 18,  0,  0,  0,
        0,  5,  5,  4,  2,  1,  1,  1,  1,  1,  1,  3,  3,  3,  9,  9, 16,
       17, 12, 12, 12, 12, 12, 12,  6,  7,  7,  7,  7,  7,  7,  7,  7,  7])

```



```

1878]
[5
array([ 0, 15, 16, 16, 16, 16, 16, 16, 16, 16, 16, 17, 17, 13, 13, 14, 14,
      14, 14, 14, 14, 13,  7,  7,  7,  7,  7,  6,  6,  6,  0,  5,  5,  5,
      5,  5,  4,  4,  4,  4,  4,  3,  3, 21, 21, 21, 21, 21, 21, 20, 21,
      15, 15, 15, 15, 15, 15, 15, 14, 13, 12, 12, 12, 12, 12, 12, 13, 13,
      13, 13,  6,  7,  7,  7,  7,  8,  9,  9,  9,  9,  9, 15, 16, 16, 16,
      16, 16, 16, 16, 16, 17, 17, 17, 12, 12, 12, 18, 18, 18, 19, 19,  1,
      1,  1,  1,  1,  1,  1,  2,  3,  3,  3,  3, 16, 16, 12, 12, 12, 12,
      12, 12, 12,  6,  7,  7,  7,  7,  7,  7,  7,  7,  7])

1850]
[5
array([ 0, 23, 21, 21, 21, 15, 15, 15, 15, 15, 15, 15, 15, 15, 14, 14,
      14, 13, 13, 13,  7,  7,  7,  6,  6,  6,  0,  0,  0,  0,  0,  5,  5,
      5,  5,  5,  4,  4,  4,  4,  4,  3,  3, 21, 21, 21, 21, 21, 21, 15,
      15, 15, 15, 14, 14, 13, 13, 13, 13, 13, 13, 12, 12, 17, 17, 17,
      17, 17, 17, 17, 17, 17, 17, 12, 18, 18, 18, 18, 18,  0,  0,  0,
      0,  0,  3,  3,  3,  3,  2,  2,  2,  2,  3,  9,  9, 10, 11, 11, 11,
      11, 11, 11, 11,  6,  7,  7,  7,  7,  7,  7,  7,  7,  7])

452]
[5
array([ 0,  1, 22, 16, 16, 22, 22, 22, 22, 22, 22, 16, 16, 15, 15, 14, 14,
      14, 14, 14, 14, 13, 13, 13, 13,  7,  6,  6,  6,  6,  6,  0,  0,  0,
      0,  0,  5,  5,  5,  4,  4,  4,  4,  4,  4,  4,  4,  3, 21, 21, 21,
      21, 21, 21, 21, 15, 15, 15, 14, 14, 14, 14, 13, 13, 13, 13, 12, 12,
      12, 12, 12, 13, 14, 14, 15, 15, 15, 15, 16, 16, 17, 17, 17, 16, 16,
      16, 16, 16, 16, 16, 16, 16, 16, 16, 17, 17, 17, 18, 18, 19, 19, 19,
      19,  1,  1,  1,  1,  1,  1,  1,  1,  1,  1,  1,  3,  3,  3,  3,  3,
      15, 15, 17, 12, 12, 12, 12, 12, 12, 12, 12, 15, 15, 15, 15, 15, 15,
      15, 15, 15])

1856]
[5
array([ 0,  1,  4, 22, 22, 22, 22, 22, 22, 22, 15, 15, 15, 15, 15, 14, 14,
      14, 14, 14, 14, 13, 13, 13,  7,  7,  7,  6,  6,  6,  0,  0,  0,  5,
      5,  4,  4,  4,  4,  4,  4,  5,  5,  5,  5,  5,  4,  4,  4,  4,  3,
      21, 21, 21, 21, 21, 15, 15, 15, 15, 15, 14, 14, 14, 13, 13, 13, 13,
      13, 13, 13, 12, 12, 12, 12, 12, 12, 17, 17, 16, 16, 16, 16, 16, 16,
      17, 17, 17, 17, 18, 18, 18, 18, 18, 18, 18, 18, 19, 19, 19, 19, 19,  1,
      1,  1,  1,  1,  1,  1,  3,  3,  3,  3,  3, 15, 15, 17, 12, 12,
      12, 12, 12, 12, 12, 15, 15, 15, 15, 15, 15, 15, 15, 15])

1826]
[5
array([ 0,  0,  4,  4, 22, 22, 22, 22, 22, 16, 15, 15, 15, 15, 14, 14, 14,
      14, 13, 13, 13, 13, 13,  7,  7,  6,  6,  6,  0,  0,  0,  0,  0,  5,
      5,  5,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  22, 21, 21,
      21, 21, 21, 15, 15, 15, 14, 14, 14, 14, 13, 13, 13, 13, 15, 15,
      14, 13, 14, 14, 17, 17, 17, 17, 17, 16, 16, 16, 16, 16, 17, 17, 17,
      17, 12, 13, 13, 13, 13, 19, 19, 19, 18,  0,  0,  0,  0,  0,  0,  0,

```

```

    0, 3, 3, 3, 3, 3, 9, 15, 17, 12, 12, 12, 12, 12, 12, 12, 12,
    14, 8, 8, 8, 8, 8, 8, 8, 8])
425]
[5
array([ 0, 22, 22, 22, 22, 21, 15, 14, 14, 14, 14, 14, 15, 15, 15, 15, 15,
    14, 14, 13, 13, 12, 6, 6, 6, 0, 0, 0, 0, 0, 0, 5, 4, 4,
    4, 3, 3, 3, 4, 4, 4, 4, 4, 22, 22, 22, 22, 22, 22, 21, 21,
    21, 21, 14, 14, 14, 14, 14, 14, 14, 13, 13, 13, 14, 15, 15, 15, 15, 17,
    17, 17, 17, 17, 17, 17, 16, 16, 16, 16, 16, 16, 17, 17, 13, 13,
    19, 19, 19, 18, 0, 0, 0, 0, 0, 0, 0, 1, 1, 1, 2, 3, 3,
    3, 9, 15, 16, 12, 12, 12, 12, 12, 12, 12, 6, 8, 8, 8, 8, 8,
    8, 8, 8, 8])
447]
[5
array([ 0, 16, 14, 14, 13, 12, 12, 12, 23, 23, 22, 22, 22, 15, 15, 15, 15,
    14, 14, 14, 13, 13, 7, 6, 6, 6, 0, 0, 0, 0, 5, 5, 4, 4,
    4, 4, 4, 4, 4, 4, 3, 3, 21, 21, 21, 21, 15, 15, 15, 15, 15,
    15, 14, 14, 14, 13, 13, 13, 13, 12, 17, 17, 12, 13, 13, 13, 12, 12,
    12, 17, 17, 17, 17, 17, 17, 17, 17, 17, 23, 23, 23, 23, 23, 18, 18,
    18, 18, 18, 19, 1, 1, 1, 1, 1, 2, 3, 3, 3, 9, 16, 17, 12,
    12, 12, 12, 12, 6, 1, 1, 1, 1, 1, 1, 1, 1, 1])
451]
[5
array([ 0, 22, 22, 21, 20, 20, 15, 15, 15, 15, 15, 15, 15, 15, 15, 14, 14,
    13, 13, 13, 13, 7, 7, 7, 7, 7, 1, 0, 0, 5, 4, 4, 4, 4,
    4, 4, 4, 4, 5, 5, 5, 0, 0, 0, 0, 3, 3, 3, 3, 3, 21,
    21, 21, 15, 15, 15, 15, 15, 15, 14, 14, 13, 13, 13, 13, 15, 15, 15,
    15, 15, 16, 17, 12, 12, 12, 12, 12, 12, 17, 17, 17, 17, 17, 17, 23, 23,
    23, 18, 19, 19, 19, 19, 19, 19, 19, 19, 0, 0, 1, 1, 1, 1, 0,
    0, 0, 2, 3, 3, 3, 3, 15, 15, 17, 12, 12, 12, 12, 12, 12, 12,
    12, 15, 15, 15, 15, 15, 15, 15, 15, 15])
1830]
[5
array([ 0, 0, 22, 22, 22, 22, 22, 22, 22, 21, 15, 15, 14, 14, 14, 14, 14,
    14, 14, 13, 13, 12, 6, 6, 6, 6, 6, 6, 0, 1, 1, 0, 0,
    0, 0, 0, 0, 0, 0, 0, 0, 5, 5, 4, 4, 4, 4, 4, 4, 3,
    21, 21, 21, 21, 21, 21, 15, 15, 15, 15, 14, 14, 14, 14, 13, 12, 12,
    12, 12, 12, 12, 16, 16, 15, 14, 13, 13, 12, 12, 6, 6, 6, 6, 7,
    8, 9, 9, 9, 9, 10, 16, 16, 16, 16, 16, 16, 16, 16, 16, 16, 15,
    14, 13, 13, 13, 19, 19, 1, 1, 0, 0, 0, 0, 1, 3, 3, 3, 3,
    9, 15, 16, 12, 12, 12, 12, 12, 12, 12, 12, 8, 8, 8, 8, 8, 8,
    8, 8, 8])
443]
[5
array([ 0, 23, 21, 21, 20, 20, 22, 22, 22, 22, 22, 16, 15, 15, 15, 15, 15,
    15, 14, 14, 14, 13, 13, 13, 13, 13, 7, 7, 6, 6, 0, 0, 0, 0,
    5, 5, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 5, 5, 5, 5, 4,
    22, 21, 21, 21, 21, 21, 21, 15, 15, 15, 14, 14, 14, 14, 14, 14,

```

```

14, 15, 15, 15, 15, 14, 12, 12, 12, 12, 12, 6, 6, 6, 11, 10, 10,
16, 16, 16, 16, 16, 16, 17, 17, 17, 23, 23, 23, 18, 18, 19, 19, 18,
18, 18, 18, 18, 0, 0, 1, 1, 1, 1, 1, 2, 3, 3, 3, 3, 9,
15, 17, 12, 12, 12, 12, 12, 12, 12, 12, 8, 8, 8, 8, 8, 8, 8,
8, 8])
434]
[6
array([ 0,  8, 15, 15, 15, 15, 15, 15, 15, 15, 15, 16, 17, 12, 12, 12, 12, 12,
12, 12, 12, 12, 12, 18,  0,  0,  0,  0,  0,  0,  0,  0,  0,  0,  3,  3,
 3,  3,  3,  3,  3,  3,  2,  1,  0,  0,  0,  0,  0,  0,  0,  0,  1,  3,
 3,  3,  3, 15, 15, 15, 15, 15, 15, 15, 12, 12, 12, 12, 12, 12, 12, 12, 12,
12, 12, 12, 12, 12, 12, 18,  0,  0,  0,  0,  0,  0,  0,  0,  0,  0,  0,
 0,  5,  4,  3,  3,  3,  3,  3,  3, 21, 15, 15, 14, 13, 13, 13, 12,  6,
11, 10,  4,  4,  4,  4, 16, 15, 15, 15, 15, 15, 15, 15, 15, 15])
1921]
[6
array([ 0,  0,  3, 15, 15, 15, 15, 15, 15, 15, 15, 15, 14, 12, 12, 12, 12, 12,
12, 17, 17, 12, 18, 18,  0,  0,  0,  0,  0,  0,  1,  2,  3,  3,  3,  3,
 3,  3,  0,  0,  0,  0,  0,  0,  1,  1,  2,  3,  3,  3,  9,  9, 15, 15,
15, 15, 16, 16, 12, 12, 12, 12, 12, 12, 12, 12, 12, 12,  0,  0,  0,  0,  0,
 0,  0,  0,  0,  0,  0,  5,  4,  4,  4,  3,  3, 21, 21, 21, 15, 14,
13, 13, 12, 12,  6,  6, 11, 11, 11, 11, 11, 11, 16, 15, 15, 15, 15, 15,
15, 15, 15, 15])
1924]
[6
array([ 0, 16, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15, 12, 12, 12, 12, 12, 12,
12, 12, 12,  0,  0,  0,  0,  0,  0,  0,  0,  0,  5,  3,  3,  3,  3,  3,
 4,  4,  0,  1,  2,  2,  3,  3,  3,  3,  9,  9, 15, 15, 15, 15, 16,
16, 17, 12, 12, 12, 12, 12, 12, 12, 12, 12, 12, 12, 12, 12, 12,  0,  0,
 0,  0,  0,  0,  0,  0,  0,  3,  3,  3,  3,  3,  3,  3,  3,  3,  3, 21,
15, 15, 15, 14, 13, 12, 12, 12, 12, 12, 12, 12, 12, 12,  6, 11, 11, 16, 15,
15, 15, 15, 15, 15, 15, 15, 15])
1928]
[6
array([ 0,  0, 21, 15, 15, 14, 14, 13, 14, 14, 15, 15, 16, 17, 17, 17, 16,
16, 17, 12, 12, 12, 12, 12, 12, 12, 12, 17, 17, 17, 18,  0,  0,  0,
 0,  0,  0,  0,  2,  3,  3,  3,  3,  3,  3,  3,  1,  1,  0,  0,  0,  0,
 0,  0,  2,  3,  3,  3,  3,  3,  9, 15, 15, 15, 15, 15, 16, 16, 13,
13, 13, 13, 12, 12, 12, 12, 12, 12, 12, 12, 12, 12, 18,  0,  0,  0,
 0,  0,  0,  1,  3,  3,  3,  3,  3,  3,  3,  2,  2,  1,  0,  0,  0,  0,
 0,  0,  5,  4,  4,  3, 21, 21, 15, 14, 13, 12, 12, 12, 12, 12, 12,
12, 12, 16, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15])
1892]
[6
array([ 0, 16, 14, 14, 15, 15, 15, 15, 15, 15, 15, 15, 15, 13, 13, 12, 12,
12, 12, 12, 12,  6,  0,  0,  0,  0,  0,  0,  0,  3,  3,  3,  3,  4,
 4,  4,  4,  4,  3,  3,  3,  3,  3,  3,  3, 15, 15, 15, 15, 15, 15,
15, 13, 12, 12, 12, 12, 12, 12, 12, 12,  0,  0,  0,  0,  0,  0,  0,

```

```

    0, 1, 1, 1, 1, 1, 3, 3, 3, 3, 3, 15, 15, 15, 15, 15, 15,
    15, 13, 12, 12, 12, 12, 12, 18, 0, 0, 0, 0, 0, 0, 0, 3, 3,
    3, 3, 3, 15, 15, 12, 12, 12, 12, 12, 12, 12, 12, 15, 15, 15,
    15, 15, 15, 15, 15, 15])
527]
[6
array([ 0,  0,  9,  9, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15, 16, 17, 17,
       12, 12, 12, 12, 12, 12,  0,  0,  0,  0,  0,  0,  0,  1,  2,  2,  2,
        2,  2,  2,  2,  3,  3,  3,  3,  3,  3,  3,  3,  3, 15, 15, 15, 15,
       15, 15, 15, 13, 12, 12, 12, 12, 12, 12, 12, 12, 12, 12,  0,  0,  0,  0,
        0,  0,  5,  3,  3,  3,  3,  3,  3,  3,  3,  5,  0,  0,  0,  0,  0,
        0,  3,  3,  3, 21, 15, 15, 12, 12, 12, 12, 12, 12, 12, 12, 12, 15,
       15, 15, 15, 15, 15, 15, 15, 15])
525]
[6
array([ 0,  8,  9, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15, 12, 12,
       12, 12, 12, 12, 12,  0,  0,  0,  0,  0,  0,  0,  0,  1,  1,  1,
        1,  1,  0,  1,  1,  1,  2,  3,  3,  3,  3,  3, 15, 15, 15, 15, 16,
       16, 12, 12, 12, 12, 12, 12, 12, 12, 12, 12, 12, 12, 12, 12,  0,  0,
        0,  0,  0,  0,  0,  0,  5,  5,  5,  5,  0,  0,  0,  1,  3,  3,
        3,  3,  3, 21, 15, 15, 13, 12, 12, 12, 12, 12, 12, 12, 12, 15,
       15, 15, 15, 15, 15, 15, 15, 15])
528]
[6
array([ 0, 22, 15, 15, 15, 14, 14, 14, 14, 14, 15, 15, 17, 17, 12, 12, 12,
       12, 12,  6,  0,  0,  0,  0,  0,  0,  0,  0,  2,  3,  3,  3,  3,
        2,  2,  1,  2,  2,  2,  3,  3,  3,  9,  9, 15, 15, 15, 15, 15, 16,
       12, 12, 12, 12, 12, 12, 12, 12, 12, 12, 12,  0,  0,  0,  0,  0,  0,
        1,  1,  1,  0,  0,  0,  0,  4,  4,  3,  3,  3, 21, 21, 15, 15, 14,
       13, 13, 12,  6,  6, 11,  4,  4,  4,  4,  4, 16, 15, 15, 15, 15, 15,
       15, 15, 15, 15])
1925]
[6
array([ 0, 23, 14, 14, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15, 16,
       16, 17, 17, 12, 12, 12, 12, 18,  0,  0,  0,  0,  1,  1,  3,  3,  3,
        3,  3,  3,  3,  3,  3,  3,  3,  3,  2,  2,  2,  2,  2,  2,  3,  3,
        9,  9,  9, 15, 15, 15, 15, 16, 16, 16, 12, 12, 12, 12, 12, 12, 12,
       12, 12,  6,  0,  0,  0,  0,  0,  0,  0,  0,  5,  5,  5,  5,  0,  0,
        0,  0,  0,  1,  1,  3,  3,  3,  3, 15, 15, 15, 12, 12, 12, 12, 12,
       12, 12, 12, 12, 15, 15, 15, 15, 15, 15, 15, 15, 15])
521]
[6
array([ 0, 15, 15, 15, 15, 15, 15, 14, 13, 12, 12, 12, 12,  6,  6,  0,  0,
        0,  5,  4,  5,  0,  0,  0,  0,  0,  0,  0,  1,  5,  5,  5,  0,
        0,  0,  1,  2,  3,  3,  3,  3,  9, 15, 15, 15, 15, 15, 15, 15, 12,
       12, 12, 12, 12, 12, 12, 12, 12,  0,  0,  0,  0,  0,  0,  0,  0,
        1,  1,  1,  3,  3,  3,  3,  3,  3,  3,  3,  3,  3, 15, 15, 15, 15,
       12, 12, 12, 12, 12, 12, 12, 12, 12, 12, 15, 15, 15, 15, 15, 15,
       15, 15, 15, 15])

```

```

    15, 15])
1944]
[6
array([ 0, 23, 21, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15, 12, 12,
       12, 12, 12, 12, 18, 0, 0, 0, 0, 0, 0, 0, 0, 1, 1, 2, 3,
       3, 3, 3, 0, 0, 0, 0, 0, 0, 1, 2, 3, 3, 3, 9, 15, 15, 15,
       15, 15, 15, 16, 12, 12, 12, 12, 12, 12, 12, 12, 12, 12, 0, 0, 0,
       0, 0, 0, 0, 0, 0, 1, 0, 4, 3, 3, 3, 3, 3, 3, 3, 21, 15,
       15, 15, 15, 13, 12, 12, 12, 6, 0, 4, 3, 3, 3, 3, 3, 3, 3, 15,
       15, 15, 15, 15, 15, 15, 15, 15, 15])
1940]
[6
array([ 0, 0, 9, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15, 17, 12, 12, 17, 17,
       17, 17, 17, 12, 12, 12, 18, 0, 0, 0, 0, 0, 0, 3, 3, 3, 3,
       3, 3, 3, 4, 5, 3, 3, 3, 3, 3, 3, 3, 3, 9, 15, 15, 15,
       15, 15, 15, 15, 15, 15, 13, 12, 12, 12, 12, 12, 12, 12, 18, 0, 0, 0,
       0, 0, 0, 1, 2, 1, 1, 1, 1, 2, 3, 3, 3, 3, 3, 3, 15, 15,
       13, 12, 12, 12, 12, 12, 12, 12, 12, 12, 15, 15, 15, 15, 15, 15, 15,
       15, 15])
522]
[7
array([ 0, 15, 15, 15, 15, 16, 15, 13, 13, 13, 13, 13, 13, 14, 8, 9, 15, 15,
       15, 15, 15, 16, 17, 17, 12, 12, 12, 12, 12, 0, 0, 0, 0, 0, 0,
       1, 1, 2, 4, 4, 5, 5, 5, 5, 4, 4, 4, 4, 3, 2, 2, 2,
       2, 2, 2, 3, 3, 9, 10, 16, 16, 17, 12, 12, 13, 13, 13, 13, 13,
       13, 13, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15])
598]
[7
array([ 0, 16, 15, 15, 15, 15, 15, 15, 14, 13, 12, 12, 12, 12, 6, 6, 6,
       6, 6, 6, 11, 11, 5, 5, 5, 5, 5, 5, 0, 0, 0, 0, 0, 0,
       0, 5, 5, 5, 4, 4, 3, 3, 1, 0, 0, 0, 0, 0, 1, 1, 2,
       3, 3, 3, 3, 21, 15, 15, 14, 13, 12, 12, 12, 12, 12, 12, 6, 11,
       11, 16, 15, 15, 15, 15, 15, 15, 15, 15, 15])
1973]
[7
array([ 0, 23, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15, 14, 12, 12,
       12, 12, 12, 12, 12, 12, 0, 0, 0, 0, 0, 0, 0, 1, 1, 2, 3,
       3, 3, 4, 4, 4, 3, 3, 21, 21, 21, 21, 14, 13, 13, 13, 12, 6,
       11, 11, 11, 11, 11, 11, 16, 15, 15, 15, 15, 15, 15, 15, 15, 15])
612]
[7
array([ 0, 0, 3, 21, 15, 15, 15, 15, 15, 15, 15, 15, 13, 13, 13, 13, 12, 12,
       6, 6, 17, 15, 15, 15, 15, 15, 15, 15, 15, 14, 13, 12, 12, 12,
       6, 6, 6, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 1, 1, 0,
       0, 0, 0, 4, 4, 4, 3, 3, 21, 21, 21, 14, 14, 13, 12, 12, 12,
       12, 12, 12, 12, 12, 17, 15, 15, 15, 15, 15, 15, 15, 15, 15])
554]
[7

```

```
array([ 0, 23, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15, 14, 13, 12, 12, 12, 12,
        12, 12, 6, 6, 6, 0, 0, 0, 0, 0, 0, 0, 0, 2, 3, 3, 3,
        3, 3, 4, 4, 4, 4, 4, 3, 3, 21, 21, 21, 15, 15, 15, 14, 13,
        13, 13, 13, 6, 6, 11, 11, 10, 10, 10, 10, 10, 16, 15, 15, 15, 15,
        15, 15, 15, 15, 15])
```

2022]

[7

```
array([ 0, 23, 20, 20, 14, 14, 8, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15,
        15, 15, 15, 15, 15, 14, 13, 12, 12, 12, 6, 6, 0, 0, 0, 0, 0,
        0, 5, 4, 3, 3, 4, 4, 5, 4, 4, 3, 3, 3, 3, 21, 21, 21,
        15, 14, 13, 12, 12, 12, 12, 12, 12, 6, 11, 11, 16, 15, 15, 15, 15,
        15, 15, 15, 15, 15])
```

1956]

[7

```
array([ 0, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15, 14, 13, 13, 13, 13, 12,
        6, 6, 6, 0, 0, 5, 5, 5, 5, 5, 3, 3, 3, 3, 3, 3, 0,
        0, 0, 0, 1, 1, 1, 2, 3, 3, 3, 3, 3, 21, 15, 15, 15, 15,
        12, 12, 12, 12, 0, 5, 4, 3, 3, 3, 3, 3, 3, 15, 15, 15, 15, 15,
        15, 15, 15, 15, 15])
```

1982]

[7

```
array([ 0, 0, 3, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15, 16, 12, 12,
        12, 12, 12, 12, 0, 0, 0, 0, 0, 0, 0, 0, 1, 2, 3,
        3, 3, 4, 4, 4, 4, 4, 3, 3, 3, 3, 3, 3, 21, 15, 15, 15,
        16, 16, 17, 12, 13, 13, 13, 7, 6, 11, 10, 10, 10, 4, 4, 10, 16,
        15, 15, 15, 15, 15, 15, 15, 15, 15])
```

2029]

[7

```
array([ 0, 0, 21, 15, 15, 14, 13, 13, 14, 14, 15, 15, 15, 15, 14, 12, 12,
        12, 12, 12, 12, 15, 15, 15, 15, 15, 13, 12, 12, 12, 12, 6, 0, 0,
        0, 0, 0, 0, 0, 4, 3, 3, 3, 3, 3, 3, 21, 15, 15, 13,
        12, 12, 12, 12, 12, 12, 12, 12, 15, 15, 15, 15, 15, 15, 15, 15, 15])
```

587]

[7

```
array([ 0, 23, 15, 15, 15, 15, 15, 15, 14, 14, 13, 13, 12, 12, 12, 12, 17,
        16, 16, 16, 16, 16, 13, 13, 12, 12, 6, 0, 0, 0, 0, 0, 0, 0,
        0, 5, 4, 3, 4, 4, 4, 0, 1, 1, 1, 2, 3, 3, 3, 3, 3,
        21, 15, 15, 14, 12, 12, 12, 12, 12, 12, 12, 12, 17, 15, 15, 15,
        15, 15, 15, 15, 15, 15])
```

1968]

[7

```
array([ 0, 23, 22, 21, 20, 14, 15, 15, 15, 15, 15, 15, 15, 15, 14, 14, 14,
        14, 14, 15, 16, 16, 16, 16, 16, 17, 17, 12, 12, 12, 6, 0, 0, 0,
        0, 0, 0, 5, 4, 4, 4, 4, 4, 4, 4, 4, 21, 21, 21, 21, 14,
        14, 13, 12, 12, 12, 6, 11, 11, 11, 11, 17, 15, 15, 15, 15, 15,
        15, 15, 15])
```

594]

[7

```

array([ 0, 23, 15, 15, 15, 15, 15, 15, 14, 14, 13, 12, 12, 12, 12, 12, 12,
       17, 17, 17, 12, 12, 12, 18, 18, 0, 0, 0, 0, 0, 0, 0, 0, 5,
       3, 3, 3, 3, 3, 3, 5, 5, 5, 4, 4, 4, 3, 21, 21, 21, 15,
       15, 14, 13, 13, 13, 12, 6, 6, 11, 11, 11, 11, 11, 11, 11, 16, 15, 15,
       15, 15, 15, 15, 15, 15])
2034]
[7
array([ 0, 23, 15, 15, 15, 15, 15, 15, 15, 14, 14, 14, 12, 12, 12, 12, 12,
       12, 12, 12, 12, 18, 0, 0, 0, 0, 0, 0, 1, 1, 1, 2, 3, 3,
       3, 3, 4, 4, 4, 3, 21, 21, 15, 14, 13, 13, 12, 12, 12, 12, 12,
       12, 12, 17, 16, 16, 16, 16, 16, 16, 16, 16, 16])
604]
[7
array([ 0, 0, 3, 21, 15, 15, 15, 15, 15, 15, 15, 15, 15, 14, 13, 12, 12,
       12, 12, 12, 12, 12, 12, 12, 0, 0, 0, 0, 0, 0, 0, 0, 3, 3,
       3, 3, 3, 3, 3, 21, 21, 15, 14, 13, 13, 12, 12, 12, 12, 12,
       12, 6, 11, 16, 15, 15, 15, 15, 15, 15, 15, 15, 15])
607]
[7
array([ 0, 23, 15, 15, 14, 13, 13, 8, 15, 15, 15, 15, 15, 15, 15, 15, 16,
       17, 12, 12, 12, 12, 12, 12, 12, 12, 12, 12, 18, 0, 0, 0, 0, 0,
       0, 1, 1, 2, 3, 3, 3, 3, 3, 3, 3, 3, 3, 21, 21, 15, 15,
       14, 13, 13, 12, 6, 6, 11, 11, 11, 11, 11, 11, 16, 15, 15, 15, 15,
       15, 15, 15, 15])
2031]
[8
array([ 0, 15, 15, 14, 14, 14, 13, 12, 12, 12, 6, 6, 0, 0, 0, 0, 0,
       0, 3, 3, 3, 3, 3, 3, 0, 0, 0, 0, 0, 3, 3, 3, 3, 3, 3,
       15, 15, 15, 15, 15, 15, 15, 14, 13, 13, 13, 13, 12, 12, 12, 12, 12,
       12, 18, 0, 0, 0, 0, 0, 0, 0, 1, 1, 1, 1, 0, 0, 4, 4, 4,
       4, 3, 3, 3, 3, 3, 3, 21, 15, 15, 15, 15, 15, 15, 15, 15, 14, 13,
       13, 13, 14, 14, 14, 13, 12, 12, 12, 12, 12, 12, 6, 0, 0, 0, 0,
       0, 0, 0, 0, 0, 0, 0, 1, 3, 3, 3, 3, 3, 3, 3, 3, 3, 15,
       15, 15, 15, 15, 15, 15, 15, 15, 15, 16, 12, 12, 12, 12, 12, 12,
       6, 0, 4, 3, 3, 3, 3, 3, 3, 15, 15, 15, 15, 15, 15, 15, 15,
       15, 15])
678]
[8
array([ 0, 15, 15, 15, 15, 15, 15, 15, 13, 12, 12, 12, 12, 6, 0, 0, 0,
       0, 0, 0, 1, 2, 2, 2, 2, 1, 0, 0, 4, 3, 3, 3, 3, 3,
       3, 3, 9, 15, 15, 15, 15, 15, 15, 15, 15, 15, 13, 12, 12, 12, 12,
       12, 12, 12, 0, 0, 0, 0, 0, 1, 1, 2, 3, 3, 4, 4, 3, 3, 3,
       3, 3, 3, 3, 3, 3, 3, 3, 15, 15, 15, 15, 15, 15, 15, 13, 13,
       12, 12, 12, 12, 12, 12, 12, 12, 6, 6, 0, 0, 0, 0, 0, 0,
       0, 0, 0, 0, 4, 3, 3, 3, 3, 3, 3, 3, 21, 15, 15, 15, 15,
       15, 14, 14, 13, 13, 13, 12, 12, 12, 12, 12, 6, 0, 0, 0, 0, 0,
       0, 0, 0, 5, 3, 3, 3, 3, 3, 21, 21, 15, 14, 13, 12, 12, 12,
       12, 12, 12, 12, 12, 17, 15, 15, 15, 15, 15, 15, 15, 15])

```

```
[8  
array([ 0,  1, 15, 15, 15, 15, 15, 15, 15, 16, 17, 12, 12, 12, 12, 12,  0,  
       0,  0,  0,  0,  0,  0,  0,  0,  0,  0,  1,  2,  3,  3,  3,  3,  3,  
       3,  3, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15, 13, 13, 12, 12, 12, 12,  
      12, 12, 12, 18,  0,  0,  0,  0,  0,  0,  0,  0,  0,  0,  1,  1,  3,  
       3,  3,  3,  3,  3,  3,  3,  3, 15, 15, 15, 15, 15, 15, 15, 15, 15,  
      14, 13, 12, 12, 12, 12, 12, 12, 12, 12, 12,  6,  0,  0,  0,  0,  0,  0,  
       0,  0,  0,  0,  0,  0,  0,  0,  5,  4,  4,  3,  3,  3, 21, 15, 15,  
      13, 12, 12, 12, 12, 12, 12, 12, 12, 12, 12, 15, 15, 15, 15, 15, 15, 15,  
      15, 15])
```

```
[8
array([ 0, 23, 15, 15, 15, 15, 15, 15, 15, 15, 15, 16, 17, 12, 12, 12, 12,
       12, 12, 12, 18,  0,  0,  0,  0,  0,  0,  0,  0,  1,  1,  1,  1,  2,
        3,  3,  3,  3,  3,  3,  3,  3,  3, 15, 15, 15, 15, 15, 15, 15, 15,
       12, 12, 12, 12, 12, 12, 12, 12, 12, 12,  6,  0,  0,  0,  0,  0,  0,  0,
        4,  4,  3,  3,  2,  1,  0,  0,  0,  0,  0,  0,  0,  1,  1,  3,  3,  3,
        3,  3, 15, 15, 15, 15, 15, 15, 15, 15, 15, 12, 12, 12, 12, 12, 12, 12,
       12,  0,  0,  0,  0,  0,  0,  0,  0,  0,  5,  3,  3,  3,  3,  3,  3,  3,
        3,  3, 15, 15, 16, 17, 12, 12, 12, 12, 12, 12, 12, 12, 13, 13, 13, 15,
       15, 15, 15, 15, 15, 15, 15, 15])
```

```
[8
array([ 0, 16, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15, 16, 12, 12, 12,
       12,  6,  0,  0,  0,  0,  0,  0,  0,  0,  4,  3,  3,  3,  3,  3,  3,
       3,  3,  3, 15, 15, 15, 15, 15, 15, 15, 15, 14, 13, 13, 13, 13, 13, 13,
       12, 12, 12, 12, 12, 12, 12, 12,  0,  0,  0,  0,  0,  0,  0,  0,  0,  4,
       4,  3,  3,  3,  3,  3,  3,  3,  3,  3,  3,  3,  3, 15, 15, 15, 15, 15,
       15, 15, 15, 15, 15, 14, 13, 12, 12, 12, 12, 12,  6,  0,  0,  0,  0,
       0,  1,  3,  3,  3,  4,  4,  5,  0,  5,  5,  4,  4,  3,  3,  3,  3,
       3,  3, 15, 15, 15, 15, 15, 13, 13, 12, 12, 12, 12, 12, 12, 12, 12, 16,
       15, 15, 15, 15, 15, 15, 15, 15, 15])]
```

```
[9
array([ 0, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15, 12, 12, 12, 12, 12, 18,
        0,  0,  0,  0,  0,  1,  2,  3,  3,  3,  3,  3,  0,  0,  0,  5,  4,
        3,  3,  3,  3,  3,  3, 15, 15, 15, 15, 15, 15, 15, 15, 14, 12, 12, 12,
       12, 12, 12, 12, 12, 12, 12, 12, 12, 12,  6,  0,  0,  0,  0,  0,  0,  0,
        0,  0,  5,  4,  0,  1,  1,  1,  2,  3,  3,  3,  3,  3, 15, 15, 16,
       12, 12, 12, 12, 12, 12, 12, 12, 13, 13, 15, 15, 15, 15, 15, 15, 15,
       15, 15, 15])
```

```
[9
array([ 0, 23, 15, 15, 15, 15, 15, 15, 15, 15, 15, 12, 12, 12, 12, 12, 12,
       12, 0, 0, 0, 0, 0, 0, 0, 3, 3, 3, 3, 3, 3, 2, 1, 1,
       1, 2, 2, 3, 3, 3, 3, 3, 9, 9, 15, 15, 15, 15, 15, 15, 15,
       13, 12, 12, 12, 12, 12, 12, 12, 12, 12, 18, 0, 0, 0, 0, 0, 0, 0,
```



```

    0, 1, 1, 1, 1, 0, 0, 0, 0, 0, 4, 3, 3, 3, 3, 3, 21,
    15, 15, 15, 15, 13, 12, 12, 12, 12, 0, 3, 3, 3, 3, 3, 3, 15,
    15, 15, 15, 15, 15, 15, 15, 15, 15])
2138]
[9
array([ 0, 23, 21, 15, 14, 14, 15, 15, 15, 15, 15, 15, 16, 12, 12, 12, 12,
       12, 6, 0, 0, 0, 0, 0, 0, 0, 0, 0, 3, 3, 3, 3, 3, 2, 1,
       0, 0, 0, 1, 1, 2, 3, 3, 3, 3, 9, 15, 15, 15, 15, 15, 15,
       13, 12, 12, 12, 12, 12, 12, 12, 12, 12, 12, 12, 0, 0, 0, 0, 0,
       0, 0, 0, 0, 0, 1, 1, 1, 1, 0, 0, 0, 0, 0, 0, 1, 3,
       3, 3, 3, 15, 15, 15, 12, 12, 12, 12, 12, 12, 12, 12, 15, 15,
       15, 15, 15, 15, 15, 15])
2121]
[9
array([ 0, 0, 3, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15, 16, 17, 12, 12,
       12, 12, 12, 0, 0, 0, 0, 0, 0, 0, 4, 3, 3, 3, 3, 3, 3,
       1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 2, 3, 3, 3, 3, 9, 15,
       15, 15, 15, 16, 12, 12, 12, 12, 12, 12, 12, 17, 17, 17, 17, 12,
       12, 12, 12, 18, 0, 0, 0, 0, 0, 0, 0, 0, 1, 1, 2, 2, 1,
       1, 1, 2, 3, 3, 3, 3, 3, 3, 3, 15, 15, 15, 13, 13, 12, 12,
       12, 12, 12, 12, 12, 12, 17, 15, 15, 15, 15, 15, 15, 15, 15, 15])
2169]
[9
array([ 0, 23, 15, 15, 15, 15, 15, 15, 15, 15, 15, 12, 12, 12, 12, 12, 12,
       12, 12, 18, 0, 0, 0, 0, 0, 0, 1, 3, 3, 3, 2, 1, 0, 0,
       0, 1, 3, 3, 3, 3, 3, 9, 15, 15, 15, 15, 15, 15, 13, 13, 13,
       12, 12, 12, 12, 12, 12, 12, 12, 12, 12, 12, 12, 18, 0, 0, 0, 0,
       0, 0, 0, 0, 1, 1, 0, 0, 0, 0, 0, 0, 1, 3, 3, 3, 3, 3,
       21, 15, 15, 13, 12, 12, 12, 12, 12, 12, 12, 12, 12, 15, 15, 15, 15,
       15, 15, 15, 15, 15, 15])
2152]
[9
array([ 0, 15, 15, 15, 15, 15, 15, 15, 12, 12, 12, 12, 12, 6, 0, 0, 0,
       0, 0, 0, 0, 5, 4, 2, 2, 1, 1, 1, 1, 1, 1, 2, 3, 3,
       3, 3, 3, 3, 3, 3, 15, 15, 15, 15, 15, 15, 15, 13, 12, 12, 13,
       13, 13, 13, 13, 13, 12, 12, 12, 6, 6, 0, 0, 0, 0, 0, 0,
       0, 0, 1, 1, 1, 1, 0, 0, 1, 3, 3, 3, 3, 3, 15, 15, 15,
       15, 15, 15, 13, 13, 13, 13, 13, 13, 12, 12, 6, 6, 6, 0, 0,
       0, 0, 0, 0, 0, 5, 5, 4, 4, 3, 3, 21, 15, 14, 13, 12, 12,
       12, 12, 12, 12, 12, 12, 16, 16, 16, 16, 16, 16, 16, 16, 16])
744]
[9
array([ 0, 15, 16, 17, 17, 12, 12, 12, 12, 18, 18, 18, 18, 0, 0, 0, 0,
       0, 0, 1, 1, 1, 1, 1, 1, 1, 1, 0, 0, 0, 0, 1, 3, 3, 3,
       3, 3, 9, 15, 15, 15, 15, 15, 15, 15, 15, 13, 13, 13, 13, 13, 12, 12,
       12, 12, 12, 12, 12, 18, 0, 0, 0, 0, 0, 0, 0, 0, 1, 1, 1,
       1, 1, 1, 1, 3, 3, 3, 3, 3, 3, 3, 3, 15, 15, 15, 15, 15, 15,
       15, 14, 12, 12, 12, 12, 12, 12, 12, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0])

```

```

        3, 3, 3, 3, 15, 15, 13, 12, 12, 12, 12, 12, 12, 12, 15, 15,
        15, 15, 15, 15, 15, 15, 15])
2160]
[9
array([ 0, 15, 16, 15, 15, 14, 14, 14, 14, 14, 15, 15, 15, 15, 15, 16, 16,
        16, 17, 12, 12, 12, 12, 18, 0, 0, 0, 0, 0, 1, 1, 3, 3, 3,
        3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 9, 9,
        15, 15, 15, 15, 16, 16, 16, 12, 12, 12, 12, 12, 12, 12, 12, 12, 12,
        12, 12, 13, 13, 13, 13, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
        1, 3, 3, 3, 3, 3, 3, 3, 3, 15, 15, 15, 15, 15, 15, 12, 12, 12,
        12, 12, 0, 0, 3, 3, 3, 3, 3, 3, 3, 15, 15, 15, 15, 15, 15,
        15, 15, 15, 15])
723]
[9
array([ 0, 8, 15, 15, 15, 15, 14, 14, 17, 17, 17, 17, 12, 12, 12, 12, 12,
        18, 18, 0, 0, 0, 0, 1, 1, 1, 2, 2, 1, 1, 1, 1, 1, 1,
        1, 1, 3, 3, 3, 3, 3, 3, 15, 15, 15, 15, 15, 15, 12, 12, 12,
        12, 12, 12, 12, 12, 12, 12, 12, 12, 12, 12, 18, 0, 0, 0,
        0, 0, 0, 0, 0, 0, 0, 0, 1, 3, 3, 3, 3, 3, 9, 15,
        15, 15, 15, 14, 13, 12, 12, 12, 12, 12, 12, 6, 0, 0, 0, 0,
        3, 3, 21, 15, 15, 12, 12, 12, 12, 12, 12, 12, 23, 23, 23, 23,
        23, 23, 23, 23, 23])
2153]
[9
array([ 0, 23, 21, 15, 14, 13, 13, 13, 14, 14, 14, 15, 15, 15, 15, 16, 16,
        16, 17, 17, 17, 17, 12, 12, 18, 0, 0, 0, 0, 0, 1, 1, 2, 3,
        3, 4, 4, 4, 3, 3, 3, 3, 3, 3, 3, 9, 15, 15, 15, 15, 15,
        15, 15, 15, 15, 15, 14, 12, 12, 12, 12, 12, 12, 12, 12, 6, 0,
        0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 3, 3, 3,
        3, 3, 15, 15, 15, 12, 12, 12, 12, 12, 12, 12, 12, 15, 15, 15,
        15, 15, 15, 15, 15, 15])
698]
[9
array([ 0, 7, 16, 16, 16, 15, 15, 15, 15, 15, 15, 15, 15, 14, 13, 13, 13,
        13, 12, 12, 6, 6, 0, 0, 0, 0, 0, 0, 5, 4, 4, 4, 4, 4,
        3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 2, 2, 2, 3, 9, 9, 9, 15,
        15, 16, 16, 16, 16, 17, 12, 12, 12, 13, 12, 12, 12, 12, 12, 12, 12,
        12, 13, 13, 13, 13, 12, 6, 6, 6, 0, 0, 0, 0, 0, 0, 0, 0,
        0, 0, 0, 0, 4, 3, 3, 3, 3, 3, 21, 21, 15, 14, 13, 12, 12, 12,
        12, 12, 12, 12, 12, 17, 15, 15, 15, 15, 15, 15, 15, 15, 15])
711]
[9
array([ 0, 0, 15, 15, 15, 15, 15, 15, 15, 14, 14, 13, 13, 13, 13, 13, 13,
        13, 12, 12, 12, 12, 6, 0, 0, 0, 0, 0, 0, 1, 3, 3, 3, 4,
        4, 0, 0, 0, 0, 0, 1, 2, 3, 3, 3, 3, 9, 9, 15, 15, 15,
        16, 16, 16, 17, 17, 12, 12, 12, 12, 12, 12, 12, 12, 12, 13, 13,
        13, 13, 13, 7, 6, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
        0, 3, 3, 3, 3, 3, 3, 15, 15, 15, 13, 12, 12, 12, 12, 12, 12,

```

```

12, 12, 12, 16, 15, 15, 15, 15, 15, 15, 15, 15, 15])
705]
[9
array([ 0,  0, 15, 16, 16, 16, 16, 16, 15, 15, 15, 15, 15, 15, 14, 14, 14,
       14, 13, 13, 13, 12, 12, 12, 12,  6,  0,  0,  0,  0,  0,  0,  0,  3,
        3,  3,  3,  3,  3,  0,  0,  1,  1,  1,  1,  2,  2,  3,  3,  3,  3,
        3,  3,  9,  9,  9, 15, 15, 16, 16, 16, 16, 16, 16, 16, 12, 12, 12, 12,
       12, 12, 12, 12, 12, 12, 13, 13, 13, 13, 12, 12, 12,  0,  0,  0,  0,
        0,  0,  0,  0,  0,  0,  3,  3,  3,  3,  3,  3,  3,  3,  3,  3, 15,
       15, 15, 15, 16, 16, 12, 12, 12, 12, 13, 13, 12,  6, 11,  4,  4,  4,
        4, 16, 15, 15, 15, 15, 15, 15, 15, 15, 15])
712]
[9
array([ 0, 22, 14, 15, 15, 15, 15, 15, 15, 14, 12, 12, 12, 12,  6,  6,  0,
        0,  0,  0,  5,  5,  0,  0,  0,  0,  0,  0,  1,  2,  2,  2,  1,  1,
        0,  0,  0,  1,  1,  2,  3,  3,  3,  3,  3,  9, 15, 15, 15, 15, 15,
       15, 16, 12, 12, 12, 12, 12, 12, 12, 12, 12, 12, 12, 12, 12, 18, 18,
        0,  0,  0,  0,  0,  0,  1,  1,  1,  1,  1,  1,  1,  1,  1,  3,  3,
        3,  3,  3,  3, 21, 15, 15, 15, 13, 12, 12, 12, 12, 12, 12, 12, 12,
       12, 15, 15, 15, 15, 15, 15, 15, 15, 15])
2163]
[9
array([ 0, 16, 13, 14, 14,  8,  8,  9, 15, 15, 15, 15, 15, 16, 16, 17, 17,
       12, 12, 12, 12, 12, 12, 12, 18,  0,  0,  0,  0,  0,  0,  1,  1,  2,
        3,  3,  3,  3,  4,  4,  4,  4,  4,  4,  3,  3,  3,  3,  3,  3, 15,
       15, 15, 15, 15, 15, 16, 16, 17, 12, 13, 13, 13, 13, 13, 13, 12, 12,
       12, 12, 12, 12, 12, 12,  6,  0,  0,  0,  0,  0,  0,  0,  0,  0,
        0,  0,  3,  3,  3,  3,  3,  3,  3,  3,  3, 15, 15, 15, 15, 15, 15,
       15, 15, 12, 12, 12, 12, 12, 12, 12, 12,  0,  0,  0,  0,  0,  0,
        0,  0,  3,  3,  3,  3, 15, 15, 14, 12, 12, 12, 12, 12, 12, 12,
       16, 16, 16, 16, 16, 16, 16, 16, 16])
738]
[9
array([ 0, 23, 21, 21, 15, 14, 13,  7,  8,  9,  9, 15, 15, 15, 15, 15, 16,
       17, 17, 12, 12, 12, 18, 18,  0,  0,  0,  0,  0,  0,  2,  3,  3,  3,
        3,  2,  1,  1,  0,  0,  0,  0,  1,  2,  3,  3,  3,  3,  3, 15, 15,
       15, 15, 15, 15, 15, 12, 12, 12, 13, 13, 13, 14, 14, 15, 17, 12, 12,
       12, 12, 12, 18,  0,  0,  0,  0,  0,  0,  0,  0,  1,  1,  1,  2,  3,
        3,  3,  3,  3,  3, 21, 15, 15, 15, 13, 13, 13, 13,  6,  6, 11, 11,
       10, 10, 10, 10, 16, 15, 15, 15, 15, 15, 15, 15, 15, 15])
2174]
[10
array([ 0, 22, 22, 22, 20, 19, 20, 21, 15, 15, 15, 15, 15, 14, 14, 14, 14,
       14, 14, 13, 13, 13, 12,  6,  6,  6,  7,  7,  7,  6,  6,  0,  0,  0,
        0,  5,  5,  5,  5,  5,  4,  4,  4,  4,  4,  4,  4,  3,  3, 21, 21,
       21, 21, 21, 15, 15, 15, 16, 16, 17, 17, 12, 12, 13, 13, 13, 13, 13,
       13, 13, 13, 13, 13, 13,  7,  7,  7,  7,  7,  7,  7,  7,  7,  7,
        6,  6,  6,  0,  5,  4,  4, 22, 22, 21, 20, 19, 19, 19, 19, 19, 19])

```

```

19, 23, 23, 23, 23, 23, 23, 23, 23, 23])
2217]
[10
array([ 0, 23, 21, 20, 18, 23, 22, 22, 22, 22, 22, 21, 21, 21, 21, 21, 15,
15, 15, 15, 15, 15, 14, 14, 13, 13, 13, 13, 13, 13, 6, 6, 6,
6, 6, 6, 6, 0, 0, 0, 0, 5, 5, 5, 5, 4, 4, 4, 4, 4,
4, 4, 4, 4, 4, 21, 21, 21, 21, 21, 21, 22, 22, 22, 22, 21, 21, 21,
21, 21, 15, 15, 15, 15, 15, 15, 14, 14, 13, 13, 13, 13, 13, 13, 7,
7, 7, 6, 6, 6, 6, 0, 0, 0, 0, 0, 5, 4, 4, 4, 4, 4,
4, 3, 3, 21, 15, 15, 13, 13, 13, 12, 12, 12, 12, 12, 12, 16, 16,
16, 16, 16, 16, 16, 16])
797]
[10
array([ 0, 23, 21, 20, 20, 20, 20, 21, 15, 15, 15, 15, 15, 15, 15, 15,
15, 15, 15, 15, 14, 13, 13, 13, 13, 6, 6, 6, 6, 6, 0, 0, 0,
0, 0, 0, 5, 5, 4, 4, 4, 4, 4, 4, 4, 4, 5, 4, 4, 4,
4, 4, 21, 21, 21, 21, 21, 21, 21, 21, 21, 16, 16, 16, 16, 16, 14, 14,
14, 14, 14, 14, 14, 14, 15, 15, 15, 14, 13, 13, 13, 13, 6, 6,
6, 6, 6, 0, 0, 0, 0, 5, 5, 4, 4, 4, 4, 4, 4, 4, 3,
21, 21, 14, 13, 12, 12, 12, 12, 12, 12, 12, 12, 16, 16, 16, 16, 16,
16, 16, 16, 16])
2246]
[10
array([ 0, 16, 13, 13, 14, 14, 15, 15, 15, 15, 14, 13, 13, 13, 13, 13, 7,
7, 7, 7, 7, 6, 6, 6, 0, 0, 0, 0, 5, 5, 5, 4, 4,
4, 4, 4, 22, 21, 21, 21, 21, 21, 21, 21, 21, 21, 22, 22, 22, 21, 20,
14, 14, 14, 14, 14, 14, 14, 14, 14, 14, 13, 13, 13, 13, 7, 7, 7,
7, 7, 7, 6, 6, 0, 0, 0, 5, 4, 4, 4, 22, 21, 14, 13, 13,
13, 13, 13, 13, 13, 19, 23, 23, 23, 23, 23, 23, 23, 23, 23])
801]
[10
array([ 0, 23, 20, 21, 21, 21, 22, 22, 15, 15, 15, 15, 15, 15, 15, 15, 14,
14, 13, 13, 13, 13, 7, 7, 7, 7, 7, 6, 6, 6, 6, 0, 0, 0,
5, 5, 5, 5, 5, 5, 5, 5, 4, 4, 4, 4, 4, 22, 22, 21, 21,
21, 21, 21, 21, 21, 21, 21, 21, 15, 15, 15, 14, 14, 14, 14, 14,
14, 14, 13, 13, 13, 12, 12, 12, 6, 6, 6, 6, 6, 0, 0, 0, 0,
0, 5, 4, 4, 4, 4, 4, 4, 3, 21, 21, 15, 14, 13, 13, 12, 12,
12, 12, 12, 12, 12, 16, 16, 16, 16, 16, 16, 16, 16, 16])
790]
[10
array([ 0, 0, 22, 22, 22, 19, 19, 19, 21, 21, 15, 15, 15, 15, 15, 15, 15,
14, 14, 14, 14, 14, 14, 14, 14, 13, 13, 13, 13, 7, 7, 6, 6, 0,
0, 0, 0, 0, 5, 4, 4, 4, 4, 4, 4, 5, 5, 5, 5, 4, 4,
4, 4, 4, 4, 4, 4, 22, 22, 21, 22, 22, 16, 16, 16, 16, 15, 14,
13, 13, 13, 13, 13, 13, 13, 13, 13, 13, 7, 6, 6, 6, 6, 6, 6,
0, 0, 0, 4, 4, 4, 4, 22, 21, 19, 19, 13, 13, 13, 13, 13, 19,
0, 0, 0, 0, 0, 0, 0, 0, 0])
2186]

```

```
[10
array([ 0, 23, 19, 19, 20, 20, 21, 21, 15, 15, 15, 15, 15, 15, 15, 14, 14,
      14, 13, 13, 13, 13, 7, 6, 6, 6, 6, 0, 0, 0, 0, 0, 5, 4,
      4, 4, 4, 4, 4, 4, 4, 4, 3, 3, 3, 21, 22, 22, 22, 22, 22,
      22, 22, 22, 21, 21, 15, 15, 15, 15, 14, 14, 14, 14, 14, 13, 13, 13,
      13, 7, 6, 6, 6, 6, 6, 6, 6, 6, 0, 0, 0, 5, 4, 4, 4, 22,
      21, 21, 13, 13, 13, 13, 13, 13, 13, 19, 23, 23, 23, 23, 23, 23, 23,
      23, 23])
```

771]

```
[10
array([ 0, 22, 20, 14, 14, 14, 15, 15, 15, 15, 15, 15, 15, 15, 15, 14, 14,
      14, 13, 13, 12, 6, 6, 6, 6, 0, 0, 0, 0, 0, 0, 0, 5, 5,
      4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 5, 23, 23, 18, 0, 0, 1, 2,
      3, 3, 21, 21, 21, 15, 15, 15, 16, 16, 16, 17, 12, 12, 13, 13, 14,
      14, 14, 14, 14, 14, 13, 13, 13, 7, 7, 6, 6, 6, 6, 6, 0, 0,
      0, 0, 0, 5, 4, 4, 4, 22, 21, 15, 13, 13, 13, 13, 13, 13, 13,
      19, 23, 23, 23, 23, 23, 23, 23, 23, 23])
```

2224]

```
[10
array([ 0, 23, 21, 15, 15, 15, 15, 15, 16, 17, 17, 17, 12, 13, 13, 13, 14,
      14, 14, 14, 7, 7, 7, 6, 6, 6, 6, 0, 0, 0, 0, 5, 4, 4,
      4, 4, 4, 4, 5, 5, 5, 5, 5, 5, 5, 4, 4, 4, 4, 21, 21,
      21, 21, 21, 21, 22, 22, 21, 21, 15, 15, 15, 15, 14, 14, 14, 14,
      14, 13, 13, 13, 13, 6, 6, 6, 6, 6, 6, 6, 0, 0, 0, 0, 0,
      5, 5, 5, 4, 4, 4, 4, 4, 4, 3, 21, 21, 21, 21, 14, 13, 13,
      12, 12, 12, 12, 12, 12, 12, 17, 16, 16, 16, 16, 16, 16, 16, 16])
```

776]

```
[10
array([ 0, 22, 20, 14, 14, 14, 15, 15, 15, 15, 15, 14, 14, 13, 13, 13, 7,
      7, 7, 6, 6, 0, 0, 0, 0, 5, 5, 5, 4, 4, 4, 4, 4, 4,
      4, 4, 3, 21, 21, 21, 21, 21, 21, 21, 21, 21, 21, 15, 15, 15, 15,
      15, 15, 15, 15, 14, 14, 14, 14, 14, 13, 13, 13, 13, 6, 6, 6, 6,
      6, 6, 6, 0, 0, 0, 0, 0, 0, 5, 5, 5, 5, 5, 5, 5, 4,
      4, 4, 4, 22, 22, 22, 22, 22, 22, 21, 21, 21, 21, 21, 14, 14, 14,
      14, 14, 14, 14, 13, 13, 13, 7, 6, 6, 6, 0, 0, 0, 4, 4, 4,
      4, 22, 15, 13, 13, 13, 13, 13, 13, 13, 19, 0, 0, 0, 0, 0, 0,
      0, 0, 0])
```

799]

```
[10
array([ 0, 0, 3, 3, 22, 22, 22, 22, 22, 15, 15, 15, 15, 15, 15, 14, 14,
      14, 14, 13, 13, 13, 13, 7, 7, 7, 7, 7, 7, 6, 6, 6, 6, 5,
      5, 5, 5, 5, 5, 5, 0, 0, 0, 5, 5, 4, 4, 4, 4, 4,
      21, 21, 21, 21, 21, 21, 21, 21, 15, 15, 15, 15, 15, 15, 15, 14, 14,
      13, 13, 13, 13, 13, 13, 6, 6, 6, 6, 0, 0, 5, 4, 4, 4, 22,
      21, 20, 19, 19, 19, 19, 19, 19, 1, 0, 0, 0, 0, 0, 0, 0, 0,
      0])
```

2180]

```
[10
```

```

array([ 0, 23, 21, 21, 21, 21, 15, 14, 14, 14, 14, 14, 14, 14, 14, 14, 13,
       12, 12, 12, 12, 17, 17, 17, 15, 14, 13,  7,  7,  7,  6,  6,  0,  0,
        0,  0,  0,  5,  4,  4,  5,  5,  0,  5,  5,  5,  5,  4,  4,  4,  4,
        4,  4, 21, 21, 21, 21, 21, 21, 21, 21, 15, 16, 16, 16, 17, 12, 12, 19,
       19, 14, 14, 14, 14, 14, 14, 14, 13, 13, 13, 13, 13,  7,  6,  6,  6,
       10,  9,  9,  8,  7,  7,  7,  7,  7,  6,  6,  0,  5,  4,  4,  4, 22,
       21, 20, 19, 19, 19, 19, 19, 19, 19,  0,  0,  0,  0,  0,  0,  0,  0,
        0])

```

2197]

[10

```

array([ 0, 22, 20, 14, 14, 14, 15, 15, 14, 14, 14, 14, 14, 14, 13, 13, 13,
        7,  7,  7,  6,  6,  6,  0,  0,  0,  0,  5,  5,  5,  5,  5,  5,  5,
        4,  4,  4,  4,  4, 22, 22, 21, 21, 21, 21, 21, 21, 15, 14, 14, 13,
       14, 14, 14, 14, 14, 14, 14, 14, 14, 14, 14, 14, 13, 13, 13, 12,  6,
        6,  6,  6,  0,  0,  0,  0,  0,  5,  5,  4,  4,  4,  4,  4,  4,  4,
       22, 22, 21, 21, 14, 13, 13, 13, 13,  6, 11, 11, 11, 11, 10, 10, 16,
       16, 16, 16, 16, 16, 16, 16, 16, 16])

```

812]

[11

```

array([ 0, 15, 15, 15, 15, 15, 16, 16, 16, 16, 16, 16, 16, 17, 17, 12, 12,
       12, 12, 18, 18,  0,  0,  0,  0,  0,  0,  0,  0,  4,  4,  4,  4,
        4,  4,  4,  4,  3,  3,  3,  2,  1,  1,  2,  2,  2,  2,  2,  3,  9,
        9,  9,  9,  9, 15, 17, 17, 12,  6,  6,  6, 11, 16, 16, 16, 16,
       16, 16, 16, 16, 17, 17, 12, 12, 12, 12, 12, 12, 17, 17, 17, 17, 23, 22,
       22, 18, 18, 19, 19, 19, 19, 19,  1,  1,  1,  1,  1,  1,  3,  3,  3,
        3,  9, 15, 16, 12, 12, 12, 12, 12, 12, 12, 12,  6,  7,  7,  7,  7,  7,
        7,  7,  7,  7])

```

826]

[11

```

array([ 0, 23, 14, 14,  8, 15, 15, 15, 15, 15, 15, 15, 15, 15, 17, 17, 17,
       12, 12, 12, 12, 12, 12, 18, 18,  0,  0,  0,  0,  0,  0,  0,  0,  4,
        4,  4,  4,  4,  4,  4,  4,  4,  2,  2,  2,  2,  2,  2,  3,  3,  3,
        3,  9,  9,  9, 15, 15, 15, 15, 17, 17, 12, 12, 12, 12, 12, 12,  6,
        6,  6,  6, 11, 10, 16, 16, 16, 16, 16, 16, 16, 17, 12, 12, 12, 12, 17,
       16, 16, 16, 16, 16, 16, 16, 16, 16, 17, 12, 13, 13, 13, 13, 13, 13,
       19,  1,  1,  1,  1,  1,  1,  0,  4,  3,  3,  3, 15, 16, 12, 12, 12,
       12, 12, 12, 12, 12,  1,  1,  1,  1,  1,  1,  1,  1,  1])

```

2268]

[11

```

array([ 0, 22, 15, 15, 14, 14, 14, 15, 15, 15, 15, 15, 15, 16, 17, 17, 17,
       17, 12, 12, 12, 12, 12, 18, 18,  0,  0,  0,  0,  0,  0,  1,  1,  3,
        3,  3,  3,  3,  4,  4,  4,  4,  3,  3,  2,  2,  2,  3,  3,  3,  9,
        9,  9,  9,  8,  8,  9,  9,  9,  9, 15, 16, 16, 16, 16, 17, 17, 17,
       12, 12, 12, 12, 12, 14, 14, 14, 14, 13, 13, 12, 12, 12, 12, 18, 23,
       23, 23, 22, 22, 22, 22, 22, 21, 19, 19, 19, 19,  1,  1,  1,  1,  1,
        1,  1,  3,  3,  3,  4, 16, 16, 17, 12, 12, 12, 12, 13, 13, 13, 13,
       15, 15, 15, 15, 15, 15, 15, 15, 15])

```

820]

```

[11
array([ 0,  0, 15, 15, 15, 15, 15, 15, 15, 15, 15, 16, 17, 17, 12, 12, 12,
       17, 17, 17, 12, 12, 18, 18,  0,  0,  0,  0,  1,  2,  3,  3,  3,  3,
       4,  4,  4,  4,  4,  3,  2,  2,  2,  2,  2,  2,  2,  2,  2,  8,  9,
       9,  9,  9,  9, 10, 11, 11, 11, 11, 10, 16, 16, 16, 16, 16, 17, 12,
       12, 12, 12,  6,  6,  6,  6, 10, 10, 10, 16, 16, 16, 16, 15, 15, 15,
       16, 16, 16, 17, 17, 12, 12, 12, 12, 12, 18, 18, 19, 19, 19,  1,  1,
       1,  1,  1,  1,  2,  3,  4,  4,  4,  4,  4,  4,  3,  3,  9,  9, 11,
       11, 11, 11, 11, 11, 11,  6,  7,  7,  7,  7,  7,  7,  7,  7])
860]
[11
array([ 0, 15, 14, 14, 14, 15, 15, 15, 16, 16, 17, 17, 12, 12, 12, 12, 17,
       17, 18, 18, 18, 18,  0,  0,  0,  0,  1,  1,  2,  3,  3,  3,  3,  4,
       4,  4,  4,  5,  5,  0,  0,  0,  1,  1,  2,  2,  2,  2,  3,  3,  3,
       9,  9,  9,  9,  9,  9,  9,  9, 16, 16, 12, 12,  6,  6,  6,  6, 11, 10,
       10, 15, 15, 15, 15, 15, 15, 15, 16, 17, 17, 17, 17, 17, 17, 17, 17,
       17, 17, 16, 16, 17, 17, 12, 18, 18, 19, 19, 19,  1,  1,  1,  1,  1,
       1,  2,  2,  3,  3,  3,  3,  3,  9, 16, 16, 12, 12, 12, 12, 12, 12,
       12,  6,  7,  7,  7,  7,  7,  7,  7,  7,  7])
2306]
[11
array([ 0, 23, 15, 15, 15, 15, 15, 15, 14, 13, 12, 12, 12, 12, 12, 12, 17,
       17, 23, 23, 18, 18, 18,  0,  0,  1,  1,  1,  1,  2,  3,  3,  4,  4,
       4,  4,  4,  4,  5,  0,  1,  1,  1,  1,  2,  2,  3,  3,  3,  9,  9,
       9,  9, 15, 15, 15, 16, 17, 17, 17, 17, 17, 17, 17, 12, 12, 12, 12, 12,
       17, 17, 17, 17, 17, 16, 16, 15, 15, 15, 15, 15, 14, 13, 12, 12, 12,
       13, 19, 19,  1,  1,  1,  1,  1,  0,  0,  0,  4,  4,  4,  4,  4,  3,
       3,  3,  9, 15, 16, 12, 12, 12, 12, 12, 12, 12, 12, 12, 15, 15, 15, 15,
       15, 15, 15, 15, 15])
840]
[11
array([ 0, 15, 15, 15, 15, 15, 15, 15, 12, 12, 12, 12, 12, 12, 12, 12, 18,
       18,  0,  0,  0,  0,  0,  0,  0,  0,  5,  4,  4,  3,  4,  4,  4,  4,
       4,  4,  4,  4,  1,  1,  1,  1,  1,  1,  1,  1,  2,  2,  2,  3,  9,
       9,  9,  9, 15, 16, 16, 16, 17, 12, 12, 12, 12, 12, 12, 12, 12, 12,
       12, 14, 14, 14, 15, 16, 16, 16, 16, 17, 17, 17, 23, 23, 23, 23, 23,
       18, 19, 19, 19, 19,  1,  1,  1,  1,  1,  1,  1,  3,  3,  4, 10, 16,
       16, 12, 12, 12, 12, 12, 12, 12, 13,  8,  8,  8,  8,  8,  8,  8,  8,
       8])
841]
[11
array([ 0, 23, 15, 15, 15, 14, 14, 14, 14, 15, 15, 15, 14, 12, 12, 17, 17,
       17, 17, 17, 17, 17, 23, 18, 18, 18,  0,  0,  0,  0,  0,  0,  5,  3,
       3,  4,  4,  4,  4,  4,  4,  4,  3,  3,  3,  3,  3,  3,  3,  2,  2,
       2,  2,  8,  8,  9,  9,  9,  9,  9, 15, 17, 17, 12,  6,  6,  6, 11,
       10, 16, 16, 16, 16, 16, 16, 16, 17, 12, 12, 12, 12, 12, 12, 12, 12,
       18, 18, 18, 23, 22, 22, 22, 22, 18, 19, 19, 19,  1,  1,  1,  1,  1,
       1,  3,  3,  3,  4, 16, 16, 12, 12, 12, 12, 12, 12, 12,  6,  1,  1,

```

```

1, 1, 1, 1, 1, 1, 1])
2273]
[11
array([ 0,  8, 15, 15, 15, 15, 15, 15, 15, 16, 16, 17, 17, 17, 17, 12, 12,
       12, 12, 12, 18, 18,  0,  0,  0,  0,  0,  0,  1,  2,  3,  3,  3,  3,
        4,  4,  4,  4,  5,  1,  1,  1,  1,  2,  2,  2,  2,  3,  3,  9,  9,
        9,  9,  9, 15, 16, 16, 16, 17, 12, 12, 12, 12, 12,  6,  6,  6,  6,
        9,  9, 10, 16, 16, 16, 16, 16, 16, 16, 15, 15, 15, 15, 15, 15, 17, 12,
       12, 12, 12, 12, 18, 18, 18, 18, 18,  1,  1,  1,  1,  1,  2,  2,
        3,  3,  3,  3,  4,  4,  3,  3,  3,  3,  9, 15, 17, 12, 12, 12, 12,
       12, 12, 12,  6,  8,  8,  8,  8,  8,  8,  8,  8,  8])
2296]
[11
array([ 0, 15, 15, 15, 15, 15, 14, 14, 13, 13, 12, 12,  6,  6,  6,  6,  6,
        0,  5,  5,  5,  5,  5,  5,  5,  0,  1,  1,  1,  1,  1,  1,  1,  0,
        5,  5,  4,  4,  4,  3,  2,  2,  2,  2,  2,  1,  1,  2,  2,  3,  3,
        3,  9,  9,  9,  9, 15, 15, 16, 16, 17, 17, 17, 17, 17, 17, 12, 12,
       12, 12, 13, 13, 14, 14, 14, 14, 15, 15, 16, 16, 16, 17, 17, 17, 17,
       17, 17, 17, 12, 12, 12, 18, 18, 18, 18, 18, 18,  0,  1,  1,  1,  1,
        1,  2,  2,  2,  2,  3,  3,  3,  3, 10, 16, 16, 12, 12, 12, 12, 12,
       12, 12,  7,  8,  8,  8,  8,  8,  8,  8,  8,  8])
854]
[11
array([ 0,  0, 21, 15, 15, 14, 14, 14, 14, 15, 15, 14, 14, 13, 12, 12, 12,
       17, 17, 17, 17, 16, 17, 17, 17, 18, 18, 18, 18,  0,  0,  0,  0,  1,
        2,  3,  3,  3,  3,  3,  3,  3,  3,  4, 22,  0,  0,  0,  0,  0,  0,
        1,  1,  2,  2,  3,  3,  3,  3,  3,  3,  9,  9,  9,  8,  8,  8,  7,
        6,  6,  6,  6, 11, 11, 10, 10, 16, 16, 16, 16, 15, 15, 14, 13, 13,
       13, 13, 13, 12, 12, 12, 17, 17, 17, 17, 17, 16, 16, 22, 22, 22, 22,
       19, 19, 19, 19, 19,  1,  1,  1,  1,  1,  1,  3,  4,  4,  4, 16, 16,
       12, 12, 12, 12, 12, 12, 12,  6,  1,  1,  1,  1,  1,  1,  1,  1,  1])
2271]
[11
array([ 0, 15, 15, 15, 15, 15, 15, 15, 15, 12, 12, 12, 12, 17, 17, 17, 17,
       17, 12, 18, 18, 18, 18,  0,  0,  0,  0,  0,  0,  1,  2,  4,  4,  4,
        4,  4,  4,  4,  5,  5,  0,  1,  1,  2,  2,  2,  3,  3,  3,  9, 15,
       15, 15, 15, 15, 17, 12, 12, 12, 12, 12,  6,  6,  0,  0,  0,  4,  4,
        3,  9, 15, 15, 15, 15, 15, 16, 17, 17, 17, 17, 17, 16, 16, 16, 16,
       15, 14, 13, 13, 13, 12, 12, 18, 18, 19,  1,  1,  1,  1,  1,  1,  1,
        1,  2,  3,  4,  4,  3,  3,  9, 15, 16, 12, 12, 12, 12, 12, 12, 12,
        6,  7,  7,  7,  7,  7,  7,  7,  7,  7])
869]
[11
array([ 0, 23, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15, 16, 16, 17, 17, 17,
       12, 12, 12, 12, 18,  0,  0,  0,  0,  0,  0,  5,  3,  3,  3,  3,  3,
        3,  4,  4,  0,  0,  0,  1,  2,  2,  2,  2,  2,  2,  2,  3,  3,  3,
        9,  9,  9,  9, 15, 15, 15, 15, 15, 17, 12, 12, 12, 12,  6,  6,  6,
        6, 11, 10, 10, 16, 16, 16, 16, 16, 16, 15, 15, 14, 14, 15, 15, 16,

```



```

16, 17, 17, 17, 12, 12, 18, 18, 19, 19, 19, 1, 1, 1, 1, 1, 1,
3, 3, 4, 4, 4, 16, 16, 12, 13, 13, 13, 13, 13, 13, 1, 1, 1,
1, 1, 1, 1, 1, 1, 1])
2260]
[11
array([ 0, 15, 15, 14, 14, 14, 14, 14, 14, 12, 12, 12, 12, 12, 12, 17, 17,
17, 17, 17, 23, 23, 18, 18, 18, 18, 0, 1, 1, 1, 2, 3, 3, 4,
4, 4, 4, 4, 4, 0, 1, 1, 1, 2, 2, 3, 3, 3, 3, 3, 9,
9, 9, 9, 15, 15, 15, 15, 12, 12, 12, 6, 6, 6, 6, 6, 6, 9,
9, 9, 15, 16, 16, 16, 16, 16, 17, 17, 12, 12, 12, 12, 17, 16, 16,
16, 16, 16, 17, 12, 12, 12, 18, 18, 19, 19, 19, 1, 1, 1, 1, 1,
1, 2, 3, 3, 3, 4, 4, 4, 10, 16, 12, 12, 12, 13, 13, 13, 13,
7, 1, 1, 1, 1, 1, 1, 1, 1, 1])
2304]
[12
array([ 0, 23, 21, 15, 15, 13, 13, 13, 13, 13, 13, 13, 14, 14, 14, 14, 14,
14, 14, 15, 15, 15, 15, 14, 13, 13, 6, 6, 6, 6, 0, 0, 0, 0,
0, 5, 4, 4, 4, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 21,
21, 21, 21, 20, 20, 20, 15, 15, 15, 15, 15, 15, 15, 15, 14, 14, 13,
13, 13, 12, 12, 17, 12, 12, 12, 12, 12, 17, 17, 16, 16, 12, 12, 12,
12, 12, 6, 0, 0, 0, 0, 0, 0, 0, 5, 5, 4, 4, 4, 4, 4, 1,
1, 1, 1, 1, 1, 2, 2, 2, 2, 3, 9, 9, 9, 9, 9, 9, 16, 16,
16, 16, 16, 17, 17, 12, 12, 12, 12, 12, 12, 12, 18, 18, 19, 19, 20,
2, 2, 9, 10, 10, 10, 11, 11, 11, 23, 23, 23, 23, 23, 23, 23, 23,
23, 23])
938]
[12
array([ 0, 22, 22, 16, 16, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15,
15, 15, 14, 14, 13, 13, 13, 6, 6, 6, 0, 0, 0, 0, 5, 4, 4,
4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 21, 21, 21, 21, 21, 21,
20, 20, 20, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15, 13, 12, 12, 12, 13,
14, 15, 15, 15, 15, 15, 15, 15, 15, 16, 17, 12, 12, 12, 12, 12, 12,
6, 6, 6, 6, 0, 5, 5, 5, 5, 0, 0, 0, 0, 0, 0, 0, 0,
0, 4, 3, 3, 2, 3, 3, 3, 3, 2, 2, 2, 2, 2, 2, 2, 2,
2, 3, 9, 9, 9, 9, 9, 9, 10, 10, 10, 16, 16, 16, 16, 16, 16, 16,
16, 17, 12, 12, 12, 13, 13, 13, 13, 13, 13, 7, 1, 4, 4, 4, 4,
4, 4, 10, 10, 10, 5, 1, 1, 1, 1, 1, 1, 1, 1, 1])
897]
[12
array([ 0, 23, 21, 21, 20, 20, 15, 16, 16, 16, 15, 15, 15, 15, 15, 15, 15,
14, 14, 13, 13, 13, 13, 7, 7, 6, 6, 0, 0, 0, 0, 5, 5, 5,
5, 4, 4, 4, 4, 4, 4, 4, 4, 3, 3, 3, 21, 21, 21, 21, 20,
20, 20, 20, 15, 15, 15, 15, 15, 15, 15, 16, 17, 12, 12, 12, 13, 13,
13, 13, 13, 13, 13, 13, 12, 17, 16, 16, 16, 17, 12, 12, 12, 12, 12,
6, 0, 0, 0, 0, 0, 0, 0, 5, 5, 4, 4, 4, 4, 3, 3, 3, 2,
1, 1, 1, 1, 1, 1, 1, 1, 2, 2, 3, 3, 3, 9, 9, 9, 15, 16,
16, 16, 16, 16, 12, 12, 12, 13, 13, 12, 12, 12, 12, 17, 23, 23,
23, 23, 23, 18, 19, 20, 20, 8, 8, 8, 11, 11, 11, 11, 11, 11, 11,

```

```

11, 8, 8, 8, 8, 8, 8, 8, 8, 8])
936]
[12
array([ 0, 22, 15, 15, 15, 15, 15, 15, 14, 14, 13, 13, 13, 13, 13, 13, 13,
13, 8, 8, 8, 7, 7, 6, 6, 6, 0, 0, 0, 0, 0, 5, 5, 4,
4, 4, 4, 4, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3,
21, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15, 14, 13, 13, 12, 12, 12,
12, 12, 12, 12, 12, 12, 13, 13, 13, 14, 14, 8, 8, 8, 8, 8, 8,
8, 9, 11, 6, 6, 6, 6, 5, 5, 0, 0, 0, 0, 0, 0, 0, 0,
1, 1, 1, 2, 2, 2, 2, 2, 2, 2, 3, 3, 9, 9, 9, 10, 10,
10, 17, 17, 17, 17, 17, 16, 16, 16, 16, 16, 16, 15, 14, 13, 13, 13,
13, 13, 12, 12, 0, 0, 3, 3, 3, 3, 3, 3, 3, 3, 22, 22, 22,
22, 22, 22, 22, 22, 22])
934]
[12
array([ 0, 22, 22, 22, 22, 21, 21, 15, 15, 15, 15, 15, 15, 14, 14, 14, 14,
13, 13, 13, 7, 7, 7, 6, 6, 6, 0, 0, 0, 5, 5, 5, 5, 5,
4, 4, 3, 3, 3, 3, 3, 3, 3, 3, 3, 21, 21, 21, 15, 15, 15,
15, 15, 15, 14, 13, 13, 13, 13, 14, 14, 15, 15, 15, 16, 16, 17, 17,
12, 12, 12, 12, 12, 18, 0, 0, 0, 0, 0, 0, 0, 1, 2, 2, 3,
3, 3, 3, 3, 0, 0, 0, 0, 1, 1, 1, 2, 3, 3, 3, 9, 9,
9, 15, 15, 16, 16, 17, 12, 12, 12, 12, 12, 12, 12, 17, 17, 23, 23,
23, 19, 20, 20, 14, 7, 6, 11, 11, 11, 11, 11, 11, 17, 16, 16, 16,
16, 16, 16, 16, 16, 16])
2337]
[12
array([ 0, 22, 21, 21, 14, 14, 14, 14, 14, 14, 14, 14, 14, 14, 14, 14, 14,
15, 15, 15, 14, 14, 13, 13, 7, 7, 6, 6, 6, 0, 0, 0, 5, 5,
5, 4, 4, 4, 4, 4, 5, 0, 0, 0, 0, 0, 0, 0, 5, 4, 3,
3, 3, 3, 21, 21, 15, 15, 15, 15, 15, 14, 14, 14, 14, 14, 14, 15,
15, 15, 15, 14, 13, 12, 12, 12, 12, 12, 12, 12, 12, 12, 6, 6,
0, 0, 0, 0, 0, 5, 4, 4, 5, 0, 0, 0, 0, 0, 0, 2, 3,
3, 3, 4, 4, 0, 0, 1, 2, 2, 2, 3, 3, 3, 3, 9, 9, 9,
9, 7, 6, 6, 11, 10, 10, 16, 16, 16, 16, 16, 16, 17, 17, 12, 12,
12, 13, 13, 13, 19, 1, 1, 3, 3, 3, 3, 4, 4, 4, 4, 23, 23,
23, 23, 23, 23, 23, 23])
2363]
[12
array([ 0, 0, 22, 22, 22, 22, 22, 16, 16, 15, 15, 15, 15, 15, 15, 15, 14,
14, 13, 13, 13, 13, 13, 6, 6, 6, 0, 0, 0, 0, 0, 0, 5, 5,
4, 4, 4, 4, 4, 4, 4, 3, 3, 21, 21, 21, 21, 21, 20, 13, 13,
14, 14, 15, 15, 15, 15, 15, 15, 15, 15, 14, 14, 13, 12, 17, 17, 17,
17, 12, 12, 12, 12, 12, 12, 12, 12, 12, 12, 6, 6, 0, 0, 0, 0,
0, 0, 0, 0, 0, 0, 5, 4, 4, 3, 3, 3, 3, 3, 3, 2,
2, 2, 2, 2, 2, 2, 2, 9, 9, 9, 9, 9, 9, 10, 11, 11,
11, 11, 17, 17, 22, 22, 22, 14, 13, 13, 13, 7, 6, 11, 11, 11, 11,
11, 11, 16, 15, 15, 15, 15, 15, 15, 15, 15, 15])
898]

```

[13

```
array([ 0, 15, 15, 15, 15, 15, 15, 15, 14, 14, 12, 12, 12, 12, 12, 12, 12,
        6,  6,  0,  0,  0,  0,  0,  0,  0,  0,  2,  3,  3,  3,  3,  4,  4,
        5,  0,  0,  0,  0,  1,  1,  2,  2,  3,  3,  3,  3,  3,  9,  9, 15,
       15, 15, 15, 13, 12, 12,  6,  6,  6,  6,  6,  9,  9,  9,  9,  8,  8,
        6,  6,  6,  6, 11, 11,  5,  5,  5,  5,  5,  5,  4, 21, 21, 21, 15,
       14, 13, 12, 12, 12, 12, 12, 12, 12, 12, 16, 16, 16, 16, 16, 16, 16,
       16, 16])
```

2365]

[13

```
array([ 0, 15, 15, 15, 15, 15, 15, 15, 15, 15, 16, 17, 17, 12, 12, 12, 12,
       12, 12, 18,  0,  0,  0,  0,  0,  0,  0,  0,  1,  2,  3,  3,  3,  3,  3,
        3,  3,  3,  5,  5,  0,  0,  0,  0,  0,  1,  1,  2,  2,  2,  3,  3,
        3,  3,  3,  3,  9,  9, 15, 15, 15, 15, 15, 16, 17, 12, 12, 12, 12,
       12, 12, 13, 13, 13, 15, 15, 15, 16, 16, 17, 12, 12, 12, 18,  0,  0,
        0,  0,  0,  1,  1,  2,  2,  3,  3,  3,  3,  3,  3,  3,  3,  3,  3,
        9, 10, 16, 16, 16, 16, 16, 16, 15, 13, 13, 13, 13,  6,  0,  4,  4,  4,
        4,  4,  3,  3, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15])
```

2408]

[13

```
array([ 0,  0, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15, 16, 17, 17, 17,
       17, 12, 12, 12, 18,  0,  0,  0,  0,  0,  0,  2,  3,  3,  3,  3,  3,
        3,  4,  4,  3,  3,  3,  3,  3,  3,  3,  3,  3,  3,  9, 15, 15, 15,
       15, 15, 15, 12, 12, 12,  6,  6,  6,  6,  6, 11,  5,  5,  5, 22, 22,
       22, 21, 20, 20, 14, 13,  7,  6, 11, 11, 11, 11, 11, 11, 17, 16, 16,
       16, 16, 16, 16, 16, 16])
```

958]

[13

```
array([ 0, 22, 15, 15, 15, 15, 14, 14, 14, 14, 14, 13, 12, 12, 12, 17, 17,
       17, 17, 12, 12, 18, 18, 18,  0,  0,  0,  0,  0,  1,  2,  3,  3,  3,
        3,  3,  5,  5,  5,  5,  0,  1,  3,  3,  3,  2,  2,  2,  2,  2,  2,
        2,  8,  9,  9,  9,  9,  9, 15, 15, 15, 16, 17, 12, 12, 12, 12, 12,
       12, 17, 17, 23, 23, 23, 23, 23, 19, 19, 19, 19, 19, 19, 20,  8, 15,
       15, 12, 12, 12, 12, 12, 12, 12, 12, 12, 15, 15, 15, 15, 15, 15, 15,
       15])
```

960]

[13

```
array([ 0, 15, 15, 15, 15, 16, 16, 16, 16, 16, 16, 17, 17, 12, 12, 12, 12,
       18, 18, 18,  0,  0,  0,  0,  0,  1,  3,  3,  3,  3,  3,  3,  3,  4,
        5,  0,  0,  0,  0,  0,  0,  1,  1,  1,  1,  1,  2,  2,  3,  3,  3,
        9,  9, 15, 15, 15, 15, 16, 16, 12, 12, 12, 12, 13, 13, 13, 13, 14,
       16, 17, 17, 12, 12, 12, 18,  0,  0,  0,  0,  1,  2,  2,  2,  2,  2,
        2,  2,  3,  3,  3,  3,  3,  3,  9,  9, 15, 15, 16, 16, 16, 16, 16,
       16, 17, 12, 12, 13, 13, 13, 13,  1,  1,  4,  4,  4,  4,  4,  4, 16,
       16, 16, 16, 16, 16, 16, 16, 16])
```

2417]

[13

```
array([ 0, 15, 15, 15, 15, 15, 15, 15, 15, 14, 14, 13, 13, 12, 12, 12, 12,
```

```

12, 12, 6, 6, 6, 6, 6, 6, 5, 5, 5, 5, 0, 0, 0, 0, 0,
0, 2, 3, 3, 3, 3, 3, 4, 5, 5, 5, 5, 0, 1, 2, 2, 2,
2, 2, 2, 3, 9, 9, 9, 9, 9, 10, 10, 16, 16, 16, 16, 16, 15,
15, 15, 15, 15, 15, 14, 14, 14, 14, 13, 7, 6, 6, 6, 6, 0, 0,
0, 5, 5, 4, 4, 22, 22, 22, 22, 21, 21, 14, 13, 13, 13, 7, 7,
0, 4, 4, 4, 4, 4, 4, 4, 4, 10, 8, 8, 8, 8, 8, 8, 8,
8])
994]
[13
array([ 0, 15, 15, 15, 15, 15, 15, 15, 14, 14, 13, 12, 12, 12, 12, 12, 12,
12, 18, 18, 0, 0, 0, 0, 0, 0, 0, 0, 3, 3, 3, 3, 3, 3,
0, 0, 0, 0, 0, 0, 1, 1, 2, 2, 2, 2, 3, 3, 3, 3, 3,
9, 9, 9, 15, 15, 15, 15, 16, 16, 17, 12, 12, 12, 12, 12, 12, 12,
17, 17, 17, 17, 17, 17, 18, 18, 18, 18, 0, 1, 1, 2, 2, 1, 1,
1, 2, 2, 2, 3, 3, 3, 3, 3, 3, 4, 4, 4, 4, 4, 22, 22,
16, 16, 16, 16, 16, 17, 18, 19, 19, 19, 13, 13, 13, 13, 6, 6, 11,
11, 11, 11, 11, 11, 16, 15, 15, 15, 15, 15, 15, 15, 15, 15])
2415]
[13
array([ 0, 23, 20, 2, 8, 8, 9, 9, 9, 9, 15, 15, 15, 15, 15, 15, 15,
16, 17, 17, 17, 12, 12, 12, 12, 12, 12, 18, 18, 18, 0, 0, 0, 0, 0,
0, 0, 4, 3, 3, 3, 3, 3, 3, 4, 4, 5, 4, 2, 2, 2, 2,
2, 2, 2, 2, 3, 9, 9, 9, 9, 9, 9, 15, 15, 15, 15, 15, 15, 16,
12, 12, 12, 12, 12, 6, 6, 6, 6, 6, 0, 5, 4, 4, 4, 10, 16,
16, 15, 15, 15, 15, 15, 15, 13, 12, 12, 12, 12, 18, 18, 0, 0, 1,
1, 2, 2, 3, 3, 3, 5, 4, 3, 3, 3, 3, 3, 15, 15, 14, 7,
7, 6, 6, 11, 10, 16, 16, 16, 16, 15, 13, 13, 13, 19, 1, 2, 3,
3, 3, 3, 3, 3, 15, 16, 16, 16, 16, 16, 16, 16, 16, 16])
2397]
[13
array([ 0, 8, 15, 15, 15, 15, 15, 15, 14, 14, 14, 14, 14, 12, 12, 12, 12,
12, 12, 12, 12, 18, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 3,
3, 3, 4, 4, 4, 4, 4, 4, 3, 3, 2, 2, 2, 2, 2, 2, 3,
3, 9, 9, 15, 15, 15, 15, 15, 17, 12, 12, 12, 12, 12, 6, 6, 6,
7, 6, 6, 6, 6, 7, 11, 11, 11, 11, 11, 5, 5, 0, 0, 1, 1,
0, 5, 4, 4, 22, 22, 22, 16, 16, 15, 13, 13, 13, 13, 13, 13, 13,
13, 7, 7, 11, 10, 10, 10, 10, 10, 10, 10, 8, 8, 8, 8, 8, 8,
8, 8, 8])
992]
[13
array([ 0, 15, 14, 14, 14, 15, 15, 15, 15, 14, 14, 13, 12, 12, 12, 6, 6,
6, 11, 11, 17, 17, 17, 23, 18, 18, 18, 0, 0, 0, 0, 0, 0, 1,
2, 3, 3, 3, 3, 3, 3, 4, 0, 0, 0, 0, 1, 1, 1, 2, 2,
3, 3, 3, 3, 3, 9, 9, 15, 15, 15, 14, 14, 15, 15, 15, 15, 15,
16, 16, 17, 17, 12, 12, 12, 12, 13, 13, 13, 7, 8, 9, 15, 15, 16,
16, 16, 17, 12, 12, 18, 18, 18, 0, 0, 1, 1, 2, 2, 2, 3, 3,
4, 4, 4, 4, 3, 3, 3, 21, 21, 15, 15, 15, 15, 14, 13, 13, 13,
13, 6, 6, 11, 10, 4, 4, 4, 4, 16, 15, 15, 15, 15, 15, 15, 15,

```

```

    15, 15])
2391]
[13
array([ 0,  0,  2,  2,  3,  9, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15,
       15, 13, 12, 12, 12, 12, 12, 12, 12, 12, 18,  0,  0,  0,  0,  0,  0,
        1,  2,  2,  3,  3,  3,  4,  4,  4,  4,  3,  3,  3,  3,  3,  3,  3,
        3,  3,  3,  9, 15, 15, 15, 15, 15, 15, 15, 15, 14, 13, 12, 12, 12,  6,
        6,  6,  6,  6,  6, 11, 10, 10, 10, 10, 16, 16, 16, 16, 16, 17, 12,
       18, 18, 18, 19, 19, 19, 19, 19,  2,  3, 21, 15, 15, 12, 12, 12, 12,
       12, 12, 12, 12, 12, 15, 15, 15, 15, 15, 15, 15, 15, 15])
1003]
[13
array([ 0,  8, 16, 16, 15, 15, 15, 15, 15, 15, 15, 15, 14, 14, 13, 12, 12, 12,
       12, 17, 17, 17, 12, 12, 18,  0,  0,  0,  0,  0,  0,  0,  1,  2,  3,
        3,  3,  3,  3,  3,  4,  5,  5,  0,  0,  0,  0,  0,  1,  2,  2,  2,
        2,  3,  3,  3,  9,  9,  9, 15, 15, 15, 15, 15, 16, 12, 12, 12, 12,  6,
        6,  6,  6,  6, 10,  9,  9,  9,  9, 15, 15, 15, 15, 14, 12, 12, 12,
       12, 17, 23, 23, 18, 18,  0,  0,  0,  1,  2,  3,  3,  3, 21, 21, 15,
       15, 14, 13, 13, 12,  6,  6, 11, 11, 10, 10, 10, 10, 16, 15, 15, 15,
       15, 15, 15, 15, 15, 15])
2386]
[13
array([ 0, 22,  8,  8,  9,  9, 15, 15, 15, 15, 15, 15, 14, 14, 15, 15, 16, 16,
       17, 17, 12, 12, 12, 12, 12, 12, 18,  0,  0,  0,  0,  0,  0,  0,  0,
        0,  0,  1,  3,  3,  3,  3,  3,  4,  4,  4,  4,  4,  4,  1,  1,  1,  1,
        2,  2,  2,  2,  2,  2,  3,  9,  9,  9,  9, 15, 15, 15, 15, 12, 12,
       12,  6,  6,  6,  7,  7,  8,  8,  9,  9, 10, 10, 10, 11, 17, 17, 23,
       23, 23, 23, 22, 22, 21, 20, 20, 19, 19, 13,  7,  7, 11, 11, 10, 10,
       10, 10, 10, 16, 16, 16, 16, 16, 16, 16, 16, 16, 16, 16])
984]
[13
array([ 0,  0,  9,  9, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15, 13, 12, 12, 12,
       12, 12,  6,  6,  6,  0,  0,  0,  0,  0,  0,  0,  0,  0,  1,  2,  2,
        3,  3,  3,  3,  3,  3, 22, 23, 23, 23, 18, 18,  0,  1,  1,  2,  2,
        2,  2,  2,  3,  3,  9,  9,  9,  9,  9,  9, 10, 16, 16, 16, 16, 16, 16,
       16, 17, 17, 12, 12, 12, 12, 13, 13,  7,  7,  7,  8,  8,  9,  9, 10,
       10, 11, 17, 17, 23, 18, 18, 18,  0,  0,  0,  0,  0,  3,  3, 21, 21,
       21, 21, 14, 14, 13, 12, 12,  6, 11, 11, 11, 11, 11, 17, 15, 15, 15,
       15, 15, 15, 15, 15, 15])
2366]
[13
array([ 0, 23, 21, 15, 14, 14, 13, 13, 12, 12, 17, 16, 16, 16, 16, 22, 22,
       22, 22, 20, 13, 13, 13, 13,  7,  7,  7,  7,  7,  7,  6, 11, 11,
       11, 11,  5,  4,  4,  4, 22, 15, 15, 15, 15, 15, 15, 15, 15, 17, 12,
       12, 12, 12, 12, 18, 18, 18, 18, 18, 18,  0,  0,  0,  0,  0,  0,  0,
        0,  4,  4,  4,  4,  4,  5,  5,  5,  5,  5,  2,  2,  2,  2,  2,  2,
        2,  2,  2,  9,  9,  9,  9,  9,  9, 10, 10, 16, 16, 16, 16, 16, 16, 13,
       13, 13, 13, 13,  7,  7,  6,  6,  6, 11, 11,  5,  5,  5,  4, 22, 22,

```

```

22, 22, 23, 19, 19, 20, 20, 21, 20, 20, 14, 13, 13, 7, 6, 11, 11,
11, 11, 10, 10, 10, 16, 15, 15, 15, 15, 15, 15, 15, 15, 15])
1001]
[13
array([ 0,  0, 15, 15, 15, 14, 14, 14, 14, 14, 15, 15, 15, 17, 17, 17, 17,
17, 17, 17, 17, 17, 12, 12, 12, 18, 18,  0,  0,  0,  0,  0,  0,  5,
 3,  3,  3,  3,  3,  3,  3,  3,  3,  3,  4,  5, 23, 23, 18,  0,  0,  0,
 0,  1,  1,  1,  1,  2,  3,  3,  3,  3,  9,  9, 15, 15, 15, 16, 16,
12, 12, 12, 12, 12, 12, 13, 13, 13, 12, 12, 12,  6,  6,  0,  0,  0,
 0,  0,  1,  1,  1,  1,  1,  3,  3,  3,  3,  3, 21, 15, 15, 15, 14,
13, 13, 12, 12, 12,  6,  0,  0,  0,  0,  0,  3,  3,  3, 15, 15, 15,
16, 12, 12, 12, 18, 19, 20, 20,  2,  3,  3,  3,  3, 15, 16, 16, 16,
16, 16, 16, 16, 16, 16])
2405]
[14
array([ 0, 22, 21, 20, 14, 14, 14, 14, 15, 15, 15, 15, 15, 15, 15, 15, 14,
13, 13, 13, 13, 13, 13, 13,  7,  7,  6,  0,  0,  0,  0,  0,  5,  3,
 3,  3,  3,  3,  9,  9, 10, 10, 11, 11, 11,  5,  5,  4,  4,  4,  4,
22, 22, 22, 16, 15, 15, 15, 16, 16, 17, 12, 12, 12, 12, 12, 18, 18,
18, 18, 18, 19, 19, 20, 20, 20, 19, 19, 18, 18, 18, 18, 18, 23, 23,
22, 22, 19, 19, 19, 19, 19,  1,  1,  1,  1,  1,  1,  1,  1,  1,  1,
 1,  1,  1,  3,  4,  4, 10, 10, 16, 17, 12, 12, 12, 12, 12, 13, 13,
13, 15, 15, 15, 15, 15, 15, 15, 15, 15])
1055]
[14
array([ 0, 22, 21, 21, 21, 15, 15, 15, 15, 15, 15, 15, 15, 15, 13, 13,
13, 13, 13, 13,  7,  7,  7,  7,  7,  7,  0,  0,  5,  5,  4,  4,  4,
 4,  4,  4,  4,  3,  3,  4,  4,  4,  4, 22, 16, 16, 16, 16, 16, 12,
13, 13, 13, 12, 12, 17, 16, 16, 16, 15, 15, 16, 16, 16, 16, 16, 17,
17, 12, 18, 18, 18, 18, 18, 18, 18, 19, 20, 20, 21, 20, 19, 19, 19,
 1,  1,  1,  1,  1,  1,  1,  2,  2,  2,  3,  3,  3,  3,  3,  3,  9,
10, 10, 10, 10, 16, 17, 12, 12, 12, 12, 12, 12, 12, 12,  7,  8,  8,  8,
 8,  8,  8,  8,  8,  8])
2455]
[14
array([ 0, 23, 22, 22, 22, 22, 22, 22, 15, 15, 15, 15, 15, 15, 14, 14, 14,
14, 13, 13, 13, 13,  7,  7,  6,  6,  0,  0,  0,  0,  5,  4,  4,  4,
 4,  4,  4,  4,  4,  4,  4,  4,  4,  4, 22, 22, 22, 22, 22, 22, 16, 16,
16, 15, 15, 14, 14, 14, 14, 14, 15, 15, 16, 16, 16, 16, 16, 16, 16,
17, 17, 12, 12, 18, 18, 18, 18, 18, 19, 19,  1,  1,  1,  1,  1,  1,
 0,  5,  4,  3,  3,  3,  2,  2,  2,  2,  2,  3,  9,  9, 10, 16, 17,
12, 12, 12, 12, 12, 12, 12,  7,  8,  8,  8,  8,  8,  8,  8,  8,  8])
2447]
[14
array([ 0, 23, 22, 22, 22, 22, 22, 22, 22, 15, 15, 15, 14, 14, 14, 14, 14,
13, 13, 13, 12, 12, 12,  6,  6,  6,  0,  0,  0,  0,  0,  1,  3,  3,
 3,  3,  3,  3,  4,  4,  4,  4,  4, 10, 10, 16, 16, 16, 16, 16,
16, 13, 13, 13, 13, 13, 13, 13, 19, 19, 19, 20, 14, 15, 15, 15, 15,

```

```

16, 17, 17, 17, 23, 23, 23, 22, 22, 22, 22, 22, 22, 22, 22, 22, 18,
19, 19, 19, 19, 19, 19, 19, 19, 19, 1, 1, 1, 1, 1, 1, 1, 1,
2, 3, 4, 4, 10, 10, 16, 16, 12, 12, 13, 13, 13, 13, 13, 7, 8,
8, 8, 8, 8, 8, 8, 8, 8])
1067]
[14
array([ 0, 22, 19, 20, 14, 15, 15, 16, 16, 16, 16, 16, 16, 16, 16, 15, 15,
14, 13, 13, 13, 13, 13, 7, 7, 7, 7, 6, 6, 0, 0, 0, 5, 5,
5, 4, 4, 3, 3, 3, 3, 3, 5, 5, 5, 5, 5, 4, 4, 4, 4,
4, 22, 22, 16, 16, 16, 16, 13, 13, 13, 13, 13, 13, 13, 14, 15,
15, 15, 15, 16, 16, 16, 16, 16, 16, 16, 16, 16, 16, 16, 16, 17,
17, 23, 18, 18, 18, 19, 19, 19, 19, 19, 1, 1, 1, 1, 1, 1, 5,
4, 4, 4, 4, 4, 3, 3, 3, 3, 3, 3, 9, 9, 10, 10, 16, 17,
12, 12, 12, 12, 12, 12, 12, 13, 8, 8, 8, 8, 8, 8, 8, 8, 8])
2462]
[14
array([ 0, 16, 16, 16, 16, 16, 16, 16, 16, 16, 16, 15, 15, 14, 14, 13, 13,
13, 13, 13, 13, 7, 7, 7, 7, 7, 6, 6, 6, 6, 6, 0, 0, 0,
1, 1, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 22, 22, 22, 22,
22, 22, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15, 16, 16, 17, 17, 12,
12, 12, 17, 23, 23, 23, 23, 18, 19, 19, 19, 19, 1, 1, 1, 1, 0,
5, 5, 5, 5, 0, 0, 1, 1, 2, 3, 3, 9, 9, 16, 17, 12, 12,
12, 12, 12, 12, 12, 6, 8, 8, 8, 8, 8, 8, 8, 8, 8])
2438]
[14
array([ 0, 23, 22, 22, 22, 22, 16, 15, 15, 15, 15, 15, 14, 13, 13, 13, 13,
13, 13, 7, 7, 7, 7, 7, 0, 0, 0, 0, 5, 4, 4, 4, 4, 4,
4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 21, 21, 21, 22,
22, 22, 15, 15, 15, 15, 15, 15, 15, 15, 15, 13, 12, 17, 17, 17, 12, 12,
17, 17, 17, 17, 23, 23, 18, 18, 18, 19, 19, 19, 1, 1, 1, 1, 1,
1, 5, 5, 5, 5, 4, 3, 3, 2, 2, 2, 2, 2, 9, 9, 9, 10,
11, 11, 17, 12, 12, 12, 12, 12, 6, 8, 8, 8, 8, 8, 8, 8, 8,
8])
2443]
[14
array([ 0, 23, 21, 21, 21, 15, 15, 15, 15, 15, 15, 15, 15, 14, 14, 13,
13, 13, 13, 13, 7, 7, 7, 7, 7, 7, 6, 6, 0, 0, 0, 0,
5, 4, 4, 4, 4, 4, 4, 4, 4, 4, 3, 3, 3, 3, 3, 4, 4, 4,
16, 16, 16, 16, 16, 16, 16, 16, 16, 16, 17, 12, 12, 12, 12, 23, 23, 23,
21, 21, 16, 16, 16, 16, 16, 12, 12, 12, 18, 18, 18, 18, 18, 18, 19,
19, 19, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 0, 0, 0,
2, 3, 3, 3, 9, 16, 16, 12, 12, 12, 12, 12, 12, 12, 6, 8, 8,
8, 8, 8, 8, 8, 8])
2457]
[14
array([ 0, 22, 22, 22, 22, 22, 22, 22, 22, 22, 21, 15, 15, 14, 14, 14, 14,
14, 14, 14, 13, 13, 13, 13, 13, 7, 7, 7, 6, 6, 6, 0, 0, 0,
5, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 5, 5, 0, 0, 0, 0, 5,

```

```

    4, 4, 4, 4, 4, 22, 22, 16, 15, 15, 15, 13, 13, 13, 13, 13, 13,
    13, 13, 13, 13, 14, 15, 15, 16, 16, 16, 16, 16, 16, 16, 16, 17, 17,
    12, 18, 18, 18, 23, 18, 18, 18, 19, 19, 19, 19, 19, 1, 1, 1, 1,
    1, 1, 1, 2, 3, 3, 3, 3, 3, 3, 3, 3, 9, 10, 10, 10, 16,
    17, 12, 12, 13, 13, 13, 13, 13, 13, 8, 8, 8, 8, 8, 8, 8, 8,
    8])
2463]
[14
array([ 0,  0,  3, 21, 22, 16, 16, 16, 16, 16, 16, 16, 15, 15, 15, 15, 15,
    13, 13, 13, 13, 13, 13, 13, 7, 7, 7, 0, 0, 0, 0, 0, 5, 3,
    3, 3, 3, 3, 3, 4, 5, 5, 5, 5, 4, 4, 4, 4, 4, 22, 22,
    22, 22, 15, 15, 15, 15, 14, 14, 14, 14, 12, 12, 12, 12, 12, 12, 18,
    18, 23, 22, 22, 22, 22, 22, 19, 19, 19, 19, 19, 1, 1, 1, 1, 1,
    0, 4, 4, 3, 3, 2, 1, 1, 2, 3, 3, 9, 10, 16, 17, 12, 12,
    12, 12, 12, 12, 12, 6, 8, 8, 8, 8, 8, 8, 8, 8, 8])
2449]
[14
array([ 0, 23, 22, 22, 22, 21, 21, 22, 16, 15, 15, 15, 15, 14, 14, 14, 13,
    13, 13, 13, 13, 12, 12, 7, 7, 7, 1, 1, 1, 1, 1, 3, 3, 3,
    3, 3, 10, 10, 10, 5, 5, 5, 5, 5, 4, 4, 4, 4, 22, 22, 16,
    15, 15, 15, 15, 15, 17, 12, 12, 12, 12, 17, 17, 16, 16, 16, 16, 16,
    16, 16, 17, 12, 18, 18, 19, 19, 19, 19, 19, 1, 1, 1, 1, 1, 1,
    1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 3, 3, 3, 10, 10, 16, 17,
    12, 12, 12, 12, 12, 12, 12, 13, 15, 15, 15, 15, 15, 15, 15, 15, 15])
1039]
[14
array([ 0,  0,  5,  4, 22, 22, 22, 22, 22, 16, 16, 16, 16, 15, 14, 14, 13,
    13, 13, 13, 13, 13, 13, 7, 7, 7, 7, 7, 1, 1, 1, 0, 0, 3,
    4, 4, 10, 10, 10, 10, 11, 11, 11, 5, 5, 5, 0, 0, 1, 1, 1,
    2, 3, 3, 4, 4, 4, 16, 16, 16, 16, 16, 16, 16, 16, 12, 12, 12,
    12, 12, 12, 18, 16, 16, 16, 16, 16, 16, 15, 15, 13, 13, 13, 13, 13,
    19, 1, 1, 1, 1, 1, 0, 0, 0, 5, 4, 4, 4, 3, 3, 3, 3,
    9, 15, 17, 12, 12, 12, 12, 12, 12, 12, 12, 8, 8, 8, 8, 8, 8,
    8, 8, 8])
1069]
[14
array([ 0, 23, 22, 22, 22, 16, 16, 15, 15, 15, 15, 15, 15, 14, 14, 14, 14,
    14, 14, 13, 13, 13, 13, 7, 7, 7, 7, 1, 1, 1, 0, 0, 0, 5,
    4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 22, 22, 16, 15, 15, 14, 13,
    13, 13, 13, 13, 12, 12, 12, 12, 12, 17, 16, 16, 16, 16, 16, 16, 16,
    16, 16, 17, 12, 12, 13, 13, 19, 19, 19, 1, 1, 1, 1, 0, 0, 0,
    5, 4, 4, 4, 3, 3, 3, 9, 9, 16, 12, 12, 12, 12, 12, 12, 12,
    6, 8, 8, 8, 8, 8, 8, 8, 8, 8])
1028]
[14
array([ 0, 22, 15, 15, 15, 15, 15, 15, 14, 13, 13, 13, 13, 13, 13, 13,
    8, 8, 7, 7, 7, 7, 6, 6, 6, 0, 0, 0, 5, 5, 5, 4, 4,
    4, 4, 4, 4, 4, 4, 22, 21, 21, 21, 15, 15, 15, 14, 13, 14, 14,

```



```

15, 15, 16, 16, 16, 16, 16, 16, 17, 17, 12, 12, 18, 18, 18, 19, 19,
19, 19, 19, 1, 1, 1, 1, 1, 1, 1, 0, 5, 5, 1, 1, 1, 2,
2, 3, 3, 9, 9, 10, 17, 17, 12, 12, 12, 12, 12, 12, 6, 8, 8,
8, 8, 8, 8, 8, 8, 8])
2459]
[15
array([ 0, 22, 15, 15, 15, 15, 15, 15, 15, 15, 14, 13, 13, 12, 6, 6, 6,
6, 0, 0, 0, 0, 0, 5, 5, 0, 2, 2, 2, 2, 2, 1, 1, 1,
1, 1, 2, 3, 3, 3, 3, 3, 3, 3, 21, 21, 15, 15, 15, 15, 15, 15,
14, 14, 13, 12, 12, 12, 12, 12, 12, 12, 17, 15, 15, 15, 15, 15, 15,
13, 12, 12, 12, 12, 12, 12, 6, 6, 0, 0, 0, 0, 0, 0, 5, 5,
4, 4, 3, 2, 2, 1, 1, 1, 0, 5, 4, 4, 4, 4, 3, 21, 21,
15, 14, 14, 13, 12, 12, 12, 12, 12, 12, 12, 12, 17, 15, 15, 15, 15,
15, 15, 15, 15, 15])
2515]
[15
array([ 0, 23, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15, 14, 13, 12, 12, 12,
12, 6, 6, 6, 0, 0, 0, 0, 0, 0, 5, 4, 4, 3, 3, 3,
3, 2, 1, 0, 0, 0, 1, 1, 1, 3, 3, 3, 3, 21, 21, 15, 15,
15, 15, 15, 14, 14, 13, 13, 13, 12, 12, 12, 13, 13, 13, 13, 13, 12,
12, 12, 12, 12, 12, 12, 12, 6, 0, 0, 0, 0, 0, 0, 0, 0, 0,
5, 4, 4, 5, 0, 0, 0, 5, 5, 5, 4, 4, 4, 3, 3, 21, 21,
21, 15, 14, 13, 12, 12, 12, 12, 12, 12, 12, 12, 17, 15, 15, 15, 15,
15, 15, 15, 15, 15])
2516]
[15
array([ 0, 16, 15, 15, 14, 14, 14, 14, 14, 14, 14, 14, 14, 12, 12, 12, 6,
6, 6, 6, 6, 0, 0, 0, 0, 0, 0, 0, 1, 1, 2, 3,
3, 4, 4, 4, 4, 4, 4, 4, 3, 3, 21, 21, 21, 21, 21, 15, 15,
15, 15, 15, 14, 13, 12, 12, 12, 12, 12, 12, 16, 15, 15, 15, 15, 15,
15, 15, 15, 13, 12, 12, 12, 12, 6, 0, 0, 0, 0, 0, 0, 5, 4,
3, 3, 3, 3, 3, 3, 2, 1, 1, 1, 0, 0, 0, 0, 4, 4, 4,
3, 3, 3, 21, 21, 15, 15, 15, 15, 15, 13, 13, 13, 13, 13, 7, 6,
5, 4, 4, 4, 4, 4, 4, 16, 15, 15, 15, 15, 15, 15, 15, 15, 15])
1135]
[15
array([ 0, 23, 21, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15, 14, 12,
12, 12, 12, 12, 13, 13, 13, 6, 6, 6, 0, 0, 0, 0, 0, 5,
4, 4, 4, 4, 4, 4, 4, 3, 3, 2, 2, 2, 2, 2, 3, 3, 3,
3, 21, 15, 15, 15, 15, 15, 15, 15, 15, 16, 12, 12, 12, 12, 12,
12, 12, 12, 15, 15, 15, 15, 15, 15, 15, 15, 13, 13, 12, 12, 12,
12, 6, 6, 6, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 1, 1,
1, 1, 0, 4, 4, 4, 4, 4, 22, 21, 21, 15, 14, 13, 13, 13, 6,
6, 11, 11, 11, 11, 11, 10, 16, 15, 15, 15, 15, 15, 15, 15, 15])
1096]
[15
array([ 0, 16, 15, 15, 15, 15, 15, 15, 14, 14, 13, 13, 12, 6, 6, 6, 6,
6, 6, 0, 0, 0, 0, 0, 5, 5, 5, 5, 4, 4, 5, 4, 3, 3,

```

```

    3, 3, 3, 3, 21, 21, 21, 15, 15, 15, 15, 15, 15, 15, 14, 14, 14,
    13, 13, 13, 13, 13, 13, 13, 12, 12, 12, 6, 6, 6, 6, 0, 0, 0,
    0, 0, 0, 0, 0, 0, 0, 1, 1, 1, 0, 0, 0, 0, 0, 5, 4,
    3, 3, 3, 3, 21, 15, 15, 14, 13, 13, 13, 12, 6, 6, 11, 11, 11,
    10, 10, 16, 15, 15, 15, 15, 15, 15, 15, 15, 15])
2521]
[15
array([ 0, 16, 15, 15, 15, 15, 15, 15, 14, 14, 14, 13, 13, 13, 13, 13,
       7, 6, 6, 6, 6, 6, 0, 0, 0, 0, 0, 0, 0, 1, 1, 1, 1,
       1, 5, 5, 5, 5, 5, 5, 4, 4, 3, 3, 3, 3, 3, 3, 21, 21,
       21, 15, 15, 15, 15, 15, 15, 15, 13, 12, 12, 12, 12, 13, 13, 13, 13,
       13, 13, 12, 12, 12, 6, 6, 6, 6, 0, 0, 0, 0, 0, 0, 0, 0,
       0, 0, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 4, 4, 4, 22, 22, 21,
       15, 15, 14, 13, 13, 12, 12, 6, 11, 11, 11, 11, 11, 16, 15, 15, 15,
       15, 15, 15, 15, 15, 15])
1112]
[15
array([ 0, 23, 15, 15, 15, 15, 15, 15, 15, 15, 15, 14, 14, 13, 13, 13,
       12, 6, 6, 6, 6, 0, 0, 0, 0, 0, 0, 0, 1, 3, 3, 3, 3,
       3, 3, 3, 3, 3, 21, 21, 21, 21, 20, 20, 20, 21, 15, 15, 15, 15,
       15, 15, 15, 15, 13, 12, 12, 12, 12, 12, 12, 12, 16, 15, 15, 15, 15,
       15, 15, 13, 12, 12, 12, 12, 6, 6, 0, 0, 3, 3, 9, 9, 15, 15,
       15, 15, 13, 12, 6, 6, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 4, 3,
       3, 3, 3, 3, 3, 3, 4, 22, 16, 16, 15, 13, 13, 13, 13, 12, 6,
       11, 11, 11, 10, 10, 16, 16, 16, 16, 16, 16, 16, 16, 16])
1126]
[15
array([ 0, 15, 14, 13, 13, 12, 17, 16, 15, 15, 15, 15, 15, 14, 14, 14, 13,
       13, 12, 6, 6, 6, 6, 6, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
       0, 0, 0, 4, 4, 3, 3, 3, 3, 3, 21, 21, 21, 15, 15, 15, 15,
       14, 14, 14, 13, 13, 12, 12, 12, 12, 12, 17, 17, 16, 16, 15, 15, 14, 14,
       13, 13, 13, 12, 12, 12, 6, 6, 6, 0, 0, 0, 0, 0, 0, 0, 0,
       0, 0, 0, 1, 1, 1, 2, 2, 0, 0, 0, 0, 0, 0, 0, 0, 4,
       4, 3, 3, 3, 21, 15, 15, 13, 12, 12, 12, 12, 12, 12, 12, 12,
       15, 15, 15, 15, 15, 15, 15, 15])
1117]
[16
array([ 0, 23, 21, 14, 14, 7, 8, 8, 8, 9, 9, 8, 8, 8, 9, 10, 11,
       11, 11, 11, 11, 11, 6, 0, 0, 0, 0, 0, 5, 5, 5, 5, 4, 4,
       21, 21, 21, 21, 21, 20, 20, 19, 0, 0, 0, 0, 0, 0, 0, 0, 0,
       1, 2, 3, 3, 3, 3, 3, 15, 15, 15, 15, 15, 15, 15, 14, 12, 12,
       12, 12, 12, 12, 12, 13, 13, 12, 12, 12, 12, 0, 0, 3, 3, 3,
       3, 3, 3, 3, 3, 0, 0, 0, 0, 0, 0, 0, 0, 0])
2597]
[16
array([ 0, 23, 21, 14, 14, 14, 8, 8, 8, 8, 8, 8, 8, 9, 9, 10, 10,
       16, 16, 16, 16, 16, 12, 12, 12, 12, 6, 0, 0, 0, 0, 0, 5,
       4, 4, 3, 3, 21, 21, 21, 21, 21, 20, 20, 20, 19, 19, 18, 0, 0,

```

```

    0, 0, 0, 0, 0, 0, 1, 1, 1, 1, 1, 1, 1, 3, 3, 3, 3,
    9, 9, 15, 15, 15, 15, 16, 16, 17, 12, 12, 12, 12, 12, 12, 12, 13,
    13, 13, 13, 12, 0, 0, 1, 3, 3, 4, 4, 4, 4, 4, 4, 4, 5,
    1, 1, 1, 1, 1, 1, 1, 1, 1, 1])
2603]
[16
array([ 0, 23,  2,  2,  8,  8,  9,  9,  9,  9, 11, 11, 11,  6,  6,  8,  8,
        8,  8,  8,  8,  9,  9,  9,  9,  9, 11,  6,  6,  6, 11, 11, 11, 11,
        5, 23, 23, 23, 18, 18, 18, 18, 23, 23, 21, 21, 21, 21, 21, 21, 20,
       20, 20, 19,  0,  0,  0,  0,  0,  0,  0,  1,  1,  2,  3,  3,  3,  3,
        3,  9, 15, 15, 15, 15, 15, 16, 17, 12, 12, 12, 12, 12, 12, 12, 12,
       12, 12, 12, 13, 13,  7,  6, 11, 11, 23, 22, 20, 19, 13, 13, 13, 13,
       13,  7,  8,  8,  8,  8,  8,  8,  8,  8,  8])
2583]
[16
array([ 0, 23, 15, 15, 14, 13,  6,  6,  6, 10,  9,  9,  9,  9,  9,  9,  9,
        9,  8,  8,  8,  8,  7, 11, 11, 11, 17, 17, 17, 17, 17, 17, 12, 12,
       12, 12, 18,  0,  0,  0,  0,  0,  0,  0,  0,  0,  0,  1,  3,  3,
        3,  3,  3,  3,  3,  3,  9,  9,  9, 15, 15, 15, 15, 16, 16, 16, 17,
       17, 12, 12, 12, 12, 12, 12,  0,  0,  2,  3,  3,  3,  3,  3,  3,  3,
        3,  0,  0,  0,  0,  0,  0,  0,  0,  0,  0])
1144]
[16
array([ 0,  0,  8,  8,  8,  6,  6,  7,  7,  7,  7,  8,  8,  8,  8,  8,  8,
        9,  9,  9,  9, 15, 15, 16, 17, 17, 17, 12, 12, 12, 18, 18,  0,  0,
        0,  0,  5,  3,  3,  3, 21, 21, 20,  1,  1,  0,  0,  0,  0,  0,  0,
        1,  1,  2,  2,  2,  3,  3,  9,  9,  9, 15, 15, 16, 16, 16, 17, 17,
       12, 12, 12, 12, 12, 12, 12, 12,  0,  0,  3,  3,  3,  3,  3,  3,  3,
       21, 22, 22, 22, 22, 22, 22, 22, 22, 22, 22])
1147]
[16
array([ 0,  8,  8,  8,  9, 15, 15, 15, 15, 15, 14, 12, 12, 12,  6,  6,  6,
        6,  6,  6,  6,  0,  0,  0,  5,  5,  5,  4, 22, 22, 21, 21, 20, 20,
       20, 19,  1,  1,  1,  1,  1,  0,  0,  0,  0,  0,  0,  0,  0,  4,  3,
        3,  3,  3,  3, 21, 15, 15, 15, 15, 15, 15, 15, 14, 13, 13, 12, 12,
       12, 12, 17, 17, 12, 13, 12, 12,  6,  0,  0,  4,  3,  3,  3,  3,  3,
        3,  3,  3,  0,  0,  0,  0,  0,  0,  0,  0,  0,  0])
1178]
[16
array([ 0,  0, 21, 15, 15, 13, 12, 12,  6,  8,  8,  8,  8,  8,  8,  8,  9,
       11, 11, 11, 11, 17, 17, 17, 17, 17, 17, 12, 12, 18, 18, 18, 18, 18,
        0,  0,  1,  2,  2,  2,  2,  1,  0,  0,  0,  0,  0,  0,  1,  1,  2,
        2,  2,  3,  3,  3,  3,  3,  9, 15, 15, 15, 15, 15, 15, 17, 12, 12,
       12, 12, 12, 12, 12, 12,  0,  0,  0,  3,  3,  3,  3,  3,  3,  3,
        3,  3,  0,  0,  0,  0,  0,  0,  0,  0,  0,  0])
2609]
[16
array([ 0,  0,  2,  8,  8,  9,  9, 16, 16, 15, 14, 15, 15, 15, 15, 14, 14,

```

```

7, 6, 6, 6, 6, 6, 11, 11, 11, 11, 6, 6, 0, 0, 0, 5, 5,
5, 4, 3, 21, 21, 21, 21, 21, 20, 20, 1, 1, 0, 0, 0, 0, 0,
0, 0, 0, 1, 1, 2, 2, 3, 3, 3, 3, 9, 15, 15, 15, 15, 15,
16, 12, 12, 12, 12, 12, 12, 12, 12, 12, 12, 12, 12, 17, 16, 15, 15,
15, 15, 13, 12, 12, 0, 0, 4, 3, 3, 3, 3, 3, 3, 3, 3, 0,
0, 0, 0, 0, 0, 0, 0, 0, 0])
2584]
[16
array([ 0, 16, 7, 8, 8, 8, 8, 8, 8, 8, 9, 9, 10, 11, 11, 11, 17,
17, 17, 17, 23, 23, 23, 23, 18, 18, 18, 19, 20, 20, 20, 20, 2,
2, 2, 2, 1, 1, 1, 1, 1, 1, 1, 1, 0, 0, 0, 0, 5, 3,
3, 3, 3, 3, 3, 3, 3, 9, 15, 15, 15, 15, 15, 15, 16, 12, 12,
12, 12, 12, 12, 12, 12, 12, 12, 12, 12, 18, 0, 0, 2, 3, 3, 3,
10, 10, 11, 11, 11, 11, 11, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0])
2638]
[16
array([ 0, 23, 20, 14, 8, 8, 8, 9, 9, 9, 8, 8, 7, 6, 6, 6, 6,
6, 6, 8, 9, 9, 9, 9, 15, 15, 15, 17, 12, 12, 12, 6, 6, 0,
0, 0, 0, 5, 5, 5, 4, 21, 21, 21, 21, 21, 21, 20, 20, 19, 1,
0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 1, 1, 1, 2, 2, 3, 3,
3, 3, 9, 15, 15, 15, 15, 15, 16, 12, 12, 12, 12, 12, 12, 12, 12,
12, 13, 13, 6, 6, 0, 0, 5, 4, 4, 3, 3, 2, 2, 3, 4, 4,
4, 4, 10, 4, 4, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0])
2586]
[16
array([ 0, 0, 21, 15, 15, 13, 12, 12, 6, 7, 8, 7, 7, 8, 8, 8, 8,
9, 9, 9, 9, 10, 10, 16, 16, 16, 16, 16, 17, 12, 12, 12, 12, 18,
18, 0, 0, 0, 0, 0, 1, 2, 2, 1, 0, 0, 0, 0, 0, 4, 3,
3, 3, 3, 3, 3, 3, 9, 15, 15, 15, 15, 15, 16, 17, 12, 12,
12, 12, 12, 12, 12, 12, 12, 12, 0, 0, 3, 3, 3, 3, 3, 3, 3,
3, 3, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0])
1145]
[16
array([ 0, 0, 9, 9, 15, 15, 15, 14, 14, 14, 15, 15, 15, 14, 12, 6, 6,
6, 11, 11, 17, 17, 17, 12, 12, 0, 0, 0, 0, 0, 0, 5, 4,
4, 3, 3, 3, 21, 21, 21, 20, 19, 0, 0, 0, 0, 0, 0, 0, 0,
1, 1, 2, 2, 3, 3, 3, 3, 9, 15, 15, 15, 15, 15, 15, 15, 12,
12, 12, 12, 12, 12, 12, 12, 12, 14, 15, 15, 15, 15, 15, 16, 17, 12,
12, 12, 18, 0, 1, 3, 3, 3, 3, 3, 3, 3, 3, 4, 0, 0, 0,
0, 0, 0, 0, 0, 0])
2595]
[16
array([ 0, 22, 7, 7, 7, 10, 10, 9, 8, 8, 8, 9, 9, 9, 9, 8, 8,
6, 6, 6, 6, 6, 6, 6, 6, 5, 5, 5, 5, 5, 5, 23, 23, 23,
23, 23, 23, 18, 19, 20, 20, 20, 20, 20, 20, 20, 21, 21, 18, 0, 0,
0, 0, 0, 0, 0, 1, 1, 1, 1, 1, 1, 1, 3, 3, 3, 3,
3, 15, 15, 15, 15, 15, 15, 15, 12, 12, 12, 12, 12, 12, 12, 12, 12,
12, 17, 17, 23, 23, 19, 20, 21, 22, 22, 22, 19, 19, 1, 1, 1, 4,

```

```

    4, 4, 10, 10, 10, 10, 10, 7, 7, 7, 7, 7, 7, 7, 7, 7])
2576]
[16
array([ 0, 22, 14, 7, 7, 7, 10, 10, 9, 8, 8, 8, 9, 9, 9, 15, 15,
    15, 15, 13, 12, 12, 12, 12, 6, 6, 6, 0, 0, 0, 5, 5, 5, 5,
    4, 4, 21, 21, 21, 21, 21, 21, 21, 21, 21, 20, 19, 0, 0, 0, 0,
    0, 0, 0, 0, 1, 1, 1, 1, 1, 1, 1, 2, 3, 3, 3, 9, 15,
    15, 15, 15, 16, 17, 12, 12, 12, 12, 12, 12, 12, 12, 12, 13, 13, 12,
    17, 23, 22, 22, 14, 13, 13, 13, 1, 1, 3, 4, 4, 4, 4, 10, 10,
    10, 4, 1, 1, 1, 1, 1, 1, 1, 1, 1])
2569]
[16
array([ 0, 0, 15, 15, 15, 14, 14, 14, 14, 7, 7, 6, 6, 6, 6, 6, 11,
    11, 10, 10, 11, 11, 5, 5, 5, 5, 5, 23, 23, 22, 22, 21, 20, 20,
    20, 19, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 0, 0, 5, 4, 4,
    4, 3, 21, 21, 15, 15, 15, 15, 15, 14, 14, 13, 12, 12, 12, 12, 12,
    12, 12, 13, 15, 15, 15, 16, 17, 12, 12, 0, 0, 3, 3, 3, 3, 3,
    21, 20, 20, 2, 0, 0, 0, 0, 0, 0, 0, 0, 0])
1193]
[16
array([ 0, 22, 14, 14, 15, 15, 15, 15, 14, 14, 14, 8, 8, 8, 8, 8, 6,
    6, 6, 6, 6, 5, 5, 5, 5, 5, 4, 22, 22, 21, 21, 21, 21,
    20, 20, 19, 19, 19, 19, 19, 1, 1, 1, 1, 1, 1, 1, 1, 2, 2,
    2, 3, 3, 3, 3, 3, 10, 10, 10, 10, 16, 15, 15, 15, 15, 15, 15,
    15, 15, 12, 12, 12, 12, 12, 12, 12, 17, 17, 12, 12, 12, 0, 0, 0, 0,
    1, 3, 3, 3, 3, 21, 21, 2, 1, 1, 4, 4, 4, 4, 4, 22, 19,
    19, 7, 7, 7, 7, 7, 7, 7, 7, 7, 7])
1188]
[16
array([ 0, 15, 15, 15, 15, 15, 15, 15, 14, 13, 13, 6, 6, 6, 6, 6, 7,
    8, 9, 9, 9, 9, 9, 11, 17, 17, 6, 0, 0, 0, 5, 23, 23, 22,
    21, 20, 20, 2, 2, 1, 1, 2, 2, 2, 2, 2, 2, 2, 3, 3, 4,
    4, 3, 3, 3, 3, 3, 2, 8, 9, 9, 15, 15, 15, 15, 15, 15, 15,
    13, 13, 12, 12, 12, 12, 12, 12, 12, 12, 12, 12, 18, 18, 0, 1, 2,
    3, 3, 9, 10, 10, 11, 11, 11, 11, 11, 0, 0, 0, 0, 0, 0, 0,
    0, 0, 0])
1213]
[16
array([ 0, 7, 7, 8, 8, 8, 9, 9, 9, 9, 9, 9, 15, 15, 15, 15, 12,
    12, 12, 12, 6, 6, 6, 0, 0, 0, 0, 5, 5, 5, 4, 3, 21, 21,
    21, 21, 20, 20, 20, 20, 20, 2, 3, 21, 21, 20, 0, 0, 0, 0, 0,
    0, 0, 0, 0, 4, 4, 4, 3, 21, 21, 15, 15, 15, 15, 15, 15, 14,
    14, 13, 12, 12, 12, 12, 12, 12, 12, 12, 12, 12, 6, 6, 0, 0, 5,
    5, 3, 3, 3, 15, 15, 12, 12, 12, 12, 12, 12, 12, 0, 0, 0, 0,
    0, 0, 0, 0, 0])
1192]
[16
array([ 0, 23, 20, 14, 8, 8, 8, 8, 8, 8, 8, 8, 8, 9, 9, 9, 11,

```

```

11, 11, 11, 11, 11, 11, 11, 23, 23, 23, 23, 23, 23, 23, 23, 23, 23,
20, 20, 20, 20, 20, 20, 20, 20, 2, 2, 1, 0, 0, 0, 0, 0, 0,
0, 0, 0, 0, 1, 1, 2, 2, 3, 3, 3, 3, 3, 9, 15, 15, 15,
15, 15, 15, 15, 15, 12, 12, 12, 12, 12, 12, 12, 12, 12, 12, 12, 12,
12, 12, 0, 0, 0, 4, 3, 3, 3, 15, 15, 12, 12, 12, 12, 12, 12,
0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0])
2627]
[16
array([ 0, 15, 14, 14, 8, 8, 8, 8, 8, 7, 6, 11, 11, 11, 11, 11, 23,
23, 23, 23, 18, 18, 18, 18, 19, 20, 20, 20, 2, 2, 2, 2, 1,
0, 5, 5, 5, 5, 5, 0, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,
2, 3, 3, 3, 3, 9, 9, 15, 16, 16, 16, 16, 16, 15, 15, 13, 13,
12, 12, 12, 12, 12, 17, 17, 14, 13, 13, 13, 13, 12, 6, 0, 0, 5,
3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 0, 0, 0, 0, 0, 0, 0, 0,
0])
1175]
[16
array([ 0, 16, 13, 13, 7, 8, 8, 9, 9, 9, 9, 8, 8, 8, 8, 8, 9,
11, 17, 17, 17, 17, 17, 12, 18, 18, 18, 0, 0, 0, 0, 0, 0, 3,
3, 3, 3, 3, 2, 2, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0,
0, 0, 1, 1, 2, 3, 3, 3, 3, 3, 3, 15, 15, 15, 15, 15, 15, 16,
12, 12, 12, 12, 12, 12, 12, 12, 12, 12, 17, 17, 17, 17, 17, 12, 12, 12,
13, 19, 1, 1, 1, 3, 4, 4, 4, 4, 4, 4, 4, 4, 0, 1, 1,
1, 1, 1, 1, 1, 1])
1196]
[16
array([ 0, 0, 22, 15, 15, 14, 14, 8, 8, 8, 9, 9, 9, 9, 9, 10, 17,
17, 17, 12, 12, 12, 0, 0, 0, 0, 0, 5, 5, 4, 4, 22, 22, 22,
22, 22, 21, 20, 20, 20, 20, 20, 20, 19, 0, 0, 0, 0, 0, 0, 0,
1, 1, 2, 2, 3, 3, 3, 3, 3, 9, 9, 15, 15, 15, 15, 15, 15,
15, 15, 12, 12, 12, 12, 12, 12, 12, 12, 12, 12, 17, 14, 14, 14, 13, 13,
6, 0, 0, 4, 3, 3, 3, 3, 3, 3, 3, 3, 3, 1, 1, 1, 1, 1,
1, 1, 1, 1])
2637]
[17
array([ 0, 16, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15, 12, 12, 12, 12, 12,
12, 6, 0, 0, 0, 0, 0, 0, 0, 1, 1, 1, 2, 3, 3, 3, 3,
3, 3, 3, 15, 15, 15, 15, 15, 15, 15, 15, 15, 14, 13, 13, 13, 12,
12, 12, 6, 0, 0, 0, 0, 0, 5, 5, 5, 0, 0, 2, 3, 3, 3,
3, 3, 3, 3, 3, 3, 15, 15, 15, 15, 15, 12, 12, 12, 12, 12,
18, 1, 2, 3, 3, 3, 3, 3, 15, 15, 15, 15, 15, 15, 15, 15, 15,
15])
1254]
[17
array([ 0, 8, 15, 15, 15, 14, 14, 14, 14, 12, 12, 12, 12, 12, 6, 0, 0,
0, 0, 0, 0, 5, 4, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3,
3, 3, 15, 15, 15, 15, 15, 15, 15, 15, 14, 14, 13, 13, 13, 12, 12,
12, 12, 12, 6, 6, 0, 0, 0, 0, 5, 5, 5, 4, 3, 3, 3, 3,

```

```

        2, 1, 1, 1, 1, 1, 1, 1, 1, 1, 2, 3, 3, 3, 3, 15, 15, 15,
        15, 15, 15, 12, 12, 12, 12, 12, 12, 0, 0, 0, 0, 3, 3, 3, 15,
        15, 12, 12, 12, 12, 12, 12, 12, 12, 12, 15, 15, 15, 15, 15, 15,
        15, 15])
2701]
[17
array([ 0, 16, 15, 15, 15, 15, 15, 15, 15, 15, 14, 12, 12, 12, 12, 12, 6,
        0, 0, 0, 0, 0, 0, 0, 0, 4, 3, 3, 3, 3, 3, 4, 4, 0, 1, 1,
        1, 2, 2, 3, 3, 3, 3, 3, 3, 15, 15, 15, 15, 15, 15, 14, 12, 12,
        12, 12, 13, 13, 14, 15, 15, 15, 15, 15, 16, 17, 17, 12, 12, 12, 18, 0,
        0, 0, 0, 0, 0, 3, 3, 3, 3, 3, 3, 3, 1, 1, 1, 1, 1,
        1, 1, 3, 4, 3, 3, 3, 21, 15, 15, 15, 15, 15, 15, 12, 12, 12,
        12, 12, 0, 0, 3, 3, 3, 3, 3, 3, 3, 3, 15, 15, 15, 15, 15,
        15, 15, 15, 15])
2662]
[17
array([ 0, 15, 16, 15, 15, 15, 14, 13, 12, 12, 12, 12, 6, 0, 0, 0, 0,
        0, 5, 5, 4, 3, 3, 3, 3, 4, 4, 5, 5, 0, 0, 2, 3, 3,
        3, 3, 21, 15, 15, 15, 15, 15, 15, 14, 13, 13, 12, 12, 12, 12, 12,
        12, 12, 12, 12, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 1, 0, 0,
        0, 0, 1, 1, 1, 3, 3, 3, 3, 3, 3, 3, 9, 15, 15, 15, 15,
        16, 16, 12, 12, 12, 12, 0, 0, 3, 3, 3, 3, 3, 3, 3, 15, 15,
        15, 15, 15, 15, 15, 15, 15])
2694]
[17
array([ 0, 23, 15, 15, 15, 15, 15, 15, 15, 15, 13, 12, 12, 12, 12, 6, 0,
        0, 0, 0, 0, 0, 1, 3, 4, 4, 5, 0, 0, 1, 1, 3, 3, 3,
        3, 3, 15, 15, 15, 15, 15, 15, 15, 13, 13, 13, 13, 12, 12, 12, 12,
        12, 6, 0, 0, 0, 0, 0, 5, 4, 4, 2, 1, 1, 1, 1, 1, 3,
        3, 3, 3, 15, 15, 16, 16, 16, 12, 12, 13, 13, 13, 0, 0, 0,
        0, 0, 4, 4, 3, 3, 15, 15, 15, 12, 12, 12, 12, 12, 12, 12, 12,
        12, 15, 15, 15, 15, 15, 15, 15, 15, 15])
1272]
[17
array([ 0, 0, 3, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15, 16, 12,
        12, 12, 12, 12, 6, 0, 0, 0, 0, 0, 0, 5, 3, 3, 3, 3, 3,
        0, 4, 4, 4, 3, 3, 3, 3, 21, 15, 15, 15, 15, 15, 15, 14, 13,
        13, 12, 12, 12, 12, 12, 12, 12, 6, 6, 0, 0, 0, 0, 0, 0, 0,
        0, 0, 0, 0, 0, 1, 1, 2, 3, 3, 3, 3, 3, 3, 3, 15, 16,
        16, 16, 16, 17, 13, 13, 13, 13, 13, 6, 5, 4, 4, 4, 4, 4,
        4, 16, 15, 15, 15, 15, 15, 15, 15, 15, 15])
1225]
[17
array([ 0, 16, 15, 15, 14, 14, 14, 14, 14, 14, 17, 12, 12, 12, 6, 6, 6,
        0, 0, 0, 0, 0, 5, 5, 4, 3, 3, 2, 1, 1, 1, 1, 1, 2,
        3, 3, 3, 3, 3, 15, 15, 15, 15, 15, 15, 14, 13, 13, 13, 12,
        12, 12, 12, 12, 12, 12, 0, 0, 0, 0, 0, 0, 0, 5, 4, 4,
        4, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 21, 15, 15, 15, 15,

```

```

        13, 12, 12, 12, 12, 6, 6, 11, 4, 4, 4, 15, 15, 15, 15, 15, 15,
        15, 15, 15, 15])
2704]
[17
array([ 0,  1, 16, 15, 15, 15, 14, 14, 15, 15, 15, 15, 13, 12, 12, 12, 12,
        6,  6,  0,  0,  0,  0,  0,  0,  5,  3,  3,  3,  2,  1,  0,  0,  0,
        0,  3,  3,  3,  3,  3, 21, 15, 15, 15, 15, 15, 15, 14, 13, 13, 13,
        13, 13, 12, 12, 12, 12, 12,  6,  6,  0,  0,  0,  0,  5,  5,  4,  4,
        2,  2,  3,  2,  2,  1,  1,  0,  0,  0,  0,  0,  0,  0,  2,  3,  3,
        3,  3, 21, 15, 15, 15, 13, 12, 12, 12,  0,  0,  4,  4,  4,  4,  4,
        3, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15])
2649]
[17
array([ 0, 15, 17, 17, 12, 13, 13, 13, 13, 12, 12, 12,  6,  6,  0,  0,  0,
        0,  0,  0,  0,  5,  5,  4,  4,  3,  3,  3,  3,  3,  3, 21, 15, 15,
        15, 15, 15, 15, 15, 13, 13, 13, 14, 14, 14, 15, 15, 16, 17, 12,
        12, 12, 12,  6,  0,  0,  0,  0,  0,  5,  4,  4,  4,  4,  3,  3,  3,  3,
        1,  1,  0,  0,  0,  0,  0,  0,  3,  3,  3,  3,  3, 15, 15, 15, 15,
        15, 15, 15, 13, 13, 13, 12, 12,  6,  0,  0,  3,  3,  3,  3,  3,  3,
        3,  3,  8,  8,  8,  8,  8,  8,  8,  8,  8])
2689]
[17
array([ 0, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15, 16, 17, 12, 12, 12, 12, 12,
        18,  0,  0,  0,  0,  0,  0,  0,  3,  3,  3,  3,  3,  3,  3,  3,  3,
        3,  3,  4,  3,  3,  3,  3,  3, 21, 15, 15, 15, 15, 15, 15, 15, 13,
        13, 13, 13, 13, 12, 12, 12, 12, 12, 12,  6,  0,  0,  2,  3,  9,  9,
        11,  0,  0,  0,  0,  0,  0,  0,  0,  0,  0,  0,  0,  1,  3,  3,  3,  3,
        3, 21, 15, 15, 15, 14, 12, 12, 12, 12, 12,  6,  0,  4,  4,  4,  4,  4,
        15, 15, 15, 15, 15, 15, 15, 15, 15, 15])
2656]
[17
array([ 0, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15, 13, 12, 12, 12, 12,
        6,  6,  0,  0,  0,  0,  0,  0,  5,  4,  4,  4,  4,  4,  4,  4,  4,
        4,  2,  2,  2,  2,  3,  3,  3, 15, 15, 15, 15, 15, 15, 15, 15, 12, 13,
        13, 13, 13, 13, 12, 12, 12, 12, 12, 12, 12,  6,  6,  0,  0,  0,  0,
        0,  0,  0,  0,  0,  4,  3,  3,  3,  3,  3,  3, 21, 15, 15, 15, 15,
        15, 14, 13, 12, 12, 12,  6,  6,  6,  0,  0,  0,  0,  0,  0,  0,  4,
        3,  3,  3, 21, 21, 15, 15, 14, 13, 13, 13, 12,  6, 11, 11, 11, 10,
        10, 10, 10, 16, 15, 15, 15, 15, 15, 15, 15, 15, 15])
2645]
[17
array([ 0,  0,  9, 15, 15, 15, 15, 15, 15, 15, 15, 15, 12, 12, 12, 12, 12, 12,
        6,  0,  0,  0,  0,  0,  0,  0,  5,  5,  5,  0,  0,  0,  0,  0,  1,
        2,  3,  3,  3,  3,  3, 15, 15, 15, 15, 15, 15, 15, 13, 13, 13, 13, 13,
        13, 13, 12, 12, 12,  6,  6,  0,  0,  0,  0,  0,  5,  4,  3,  3,  2,
        1,  1,  2,  2,  3,  3,  3,  3,  3,  4, 10, 16, 16, 16, 16, 13, 13,
        13, 13, 13, 12, 12, 12, 12, 12, 12, 12, 12, 16, 16, 16, 16, 16, 16,
        16, 16, 16])

```



1259]

[17

```
array([ 0,  0, 16, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15, 16, 12, 12, 12,
       12, 12,  0,  0,  0,  0,  0,  0,  0,  0,  3,  3,  3,  3,  3,  3,  3,  3,
       3,  3,  3,  3,  3, 21, 15, 15, 15, 15, 15, 15, 15, 13, 12, 13, 13, 13,
       13, 13, 13, 13, 12, 12, 12, 12, 12, 12,  0,  0,  0,  0,  0,  0,  0,  1,
       1,  1,  1,  1,  1,  1,  1,  1,  1,  3,  3,  4,  4,  4,  4,  4,  4,
       4, 22, 22, 22, 21, 15, 14, 13, 13, 13, 13,  6,  6, 11, 11, 11, 11,
       11, 10, 16, 15, 15, 15, 15, 15, 15, 15, 15, 15])
```

2660]

[17

```
array([ 0, 23, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15, 16, 16, 17, 12,
       12, 12, 12, 12,  0,  0,  0,  0,  0,  0,  0,  4,  4,  4,  4,  4,  4,
       4,  4,  4,  4,  3,  3,  3,  3,  3, 21, 21, 15, 15, 15, 15, 15, 15,
       15, 15, 12, 12, 12, 12, 12, 12, 12, 12, 13, 14, 15, 15, 15, 15, 15, 15,
       15, 17, 12, 12, 12, 12,  0,  0,  0,  0,  0,  4,  3,  3,  3,  3,  3,
       3,  3,  0,  0,  0,  0,  0,  0,  0,  0,  0,  0,  5,  4,  3,  3,  3,
       3,  3,  3,  2,  1,  1,  1,  2,  3,  3,  9,  9, 15, 15, 15, 15, 16,
       16, 16, 12, 12, 12, 12, 12, 12, 12, 12, 12, 12,  7,  1,  0,  4,  4,  4,
       16, 15, 13, 13, 13, 13, 13, 13, 13, 13, 16, 16, 16, 16, 16, 16, 16,
       16, 16])
```

1241]

[17

```
array([ 0, 22, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15, 17, 12, 12, 12, 12,
       12,  6,  0,  0,  0,  0,  0,  0,  5,  4,  3,  3,  3,  4,  3,  3,
       2,  2,  2,  3,  3,  3,  3,  3,  3,  3, 15, 15, 15, 15, 15, 15, 15,
       15, 15, 13, 13, 12, 12, 12, 12, 12, 12, 12,  0,  0,  0,  0,  0,  5,  4,
       4,  4,  4,  3,  3,  3,  3,  3,  3,  3,  2,  1,  0,  0,  0,  0,  0,
       0,  0,  0,  0,  1,  2,  3,  3,  3,  9, 15, 15, 15, 15, 16, 17, 12,
       12, 12, 12, 12, 12, 12, 12, 17, 23, 19, 19, 19, 19, 20, 20, 20, 20,
       20, 22, 22, 22, 22, 22, 22, 22, 22, 22])
```

2644]

[17

```
array([ 0, 23, 15, 15, 15, 16, 15, 15, 15, 15, 15, 15, 15, 15, 15, 12,
       12, 12, 12, 12, 12,  6,  0,  0,  0,  0,  0,  0,  0,  0,  0,  0,
       0,  4,  4,  4,  4,  4,  5,  5,  4,  4,  3,  3,  3,  3,  3,  3,  3,
       3,  3,  3,  3,  9, 16, 16, 16, 15, 15, 15, 15, 15, 15, 13, 13, 13, 13,
       13, 13, 12, 16, 15, 13, 13, 12, 12, 12, 12, 12,  6,  0,  5,  9, 15,
       15, 15, 15, 14, 12,  6,  6,  0,  0,  0,  0,  0,  5,  4,  4,  4,  4,
       4,  5,  0,  0,  0,  1,  1,  1,  1,  2,  3,  3,  3,  3, 15, 15, 15,
       15, 16, 16, 12, 12, 12, 13, 13, 13, 13, 13, 13, 13, 13, 12,  6,  6,
       0,  0,  0,  0,  0,  0,  0,  0,  5,  5,  5,  5,  5,  5,  5,  4,  4,
       4,  4,  4,  3, 21, 21, 15, 15, 13, 12, 12, 12, 12, 12, 12, 12,
       12, 15, 15, 15, 15, 15, 15, 15, 15, 15])
```

1236]

[18

```
array([ 0, 16, 14, 14, 14, 15, 15, 14, 14, 14, 12, 12,  6,  6,  6,  6,  5,
       5,  5,  5, 23,  0,  0,  0,  0,  0,  0,  0,  0,  3,  3,  3,  3,
```

```

        3, 3, 3, 3, 3, 3, 15, 15, 15, 15, 15, 15, 15, 15, 15, 16, 12,
        13, 13, 13, 14, 15, 15, 16, 16, 17, 17, 12, 12, 12, 12, 12, 12, 12,
        18, 18, 18, 23, 23, 18, 19, 1, 0, 0, 0, 0, 0, 0, 0, 0, 4,
        3, 3, 3, 3, 9, 15, 16, 12, 12, 12, 12, 12, 12, 12, 12, 15, 15,
        15, 15, 15, 15, 15, 15])
2746]
[18
array([ 0,  0,  9, 15, 15, 15, 15, 15, 15, 15, 14, 14, 12, 12,  6,  6,  6,
        0,  0,  0,  0,  5,  5,  4,  4,  4,  4,  4,  3,  2,  1,  1,  1,  1,
        1,  1,  2,  2,  3,  3,  3,  3, 15, 15, 15, 15, 15, 15, 13, 12, 12,
        12, 12, 12, 12, 12, 12, 14, 15, 15, 15, 15, 15, 15, 15, 15, 16, 17,
        17, 17, 17, 16, 16, 16, 16, 16, 16, 16, 16, 16, 16, 12, 13, 13,
        13, 13, 19,  1,  0,  0,  0,  0,  0,  0,  0,  4,  4,  4,  3,  3,  3,
        15, 15, 16, 12, 12, 12, 12, 12, 12, 12, 12, 15, 15, 15, 15, 15, 15,
        15, 15, 15])
2764]
[18
array([ 0, 22, 14,  8,  8,  9,  9, 15, 15, 15, 15, 16, 17, 17, 12, 12, 12,
        12, 12, 12, 12,  6,  0,  0,  0,  0,  0,  0,  0,  0,  1,  2,  3,
        3,  3,  3,  3,  3,  3,  3,  3,  3,  3, 21, 21, 15, 15, 15, 15, 14,
        14, 14, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15, 14, 15, 15, 15, 13,
        12, 12, 12, 12, 12, 12, 17, 17, 17, 17, 17, 17, 23, 23, 23, 18, 18,
        18, 19, 19, 19, 18,  0,  0,  0,  0,  0,  0,  1,  3,  3,  3,  3, 15,
        16, 12, 12, 12, 12, 12, 12, 12,  6,  7,  7,  7,  7,  7,  7,  7,  7,
        7])
2720]
[18
array([ 0, 15,  7,  8,  8,  9,  9,  9,  9,  8,  8,  9, 15, 16, 17, 17, 17,
        12, 12, 12,  0,  0,  0,  0,  0,  0,  0,  5,  4,  4,  3,  3,  3,  3,
        3,  3,  3,  3,  2,  2,  1,  1,  1,  1,  2,  3,  3,  9,  9, 15, 15,
        15, 15, 15, 15, 13, 12, 12, 12, 12, 12, 12, 17, 17, 17, 17, 12, 12,
        12, 12, 12, 12, 12, 12, 13, 13, 15, 16, 16, 16, 16, 16, 22, 22, 22,
        22, 20, 13, 13, 19, 19, 19,  1,  1,  0,  0,  0,  0,  0,  0,  4,  3,
        3,  3,  9, 15, 16, 12, 12, 12, 12, 12, 12, 12,  6,  7,  7,  7,  7,
        7,  7,  7,  7,  7])
2725]
[18
array([ 0, 23, 20, 14, 14, 15, 15, 15, 15, 15, 14, 14, 13, 12,  6,  6,  6,
        6,  0,  0,  0,  0,  5,  5,  5,  4,  4,  4,  4,  3,  2,  2,  3,  3,
        3,  3,  3,  3,  3,  3, 21, 15, 15, 15, 15, 15, 15, 15, 14, 12, 12,
        12, 12, 12, 12, 12, 12, 14, 14, 15, 15, 15, 15, 15, 16, 17, 12, 12,
        12, 12, 17, 17, 16, 16, 16, 16, 16, 16, 16, 16, 17, 17, 17, 12, 12,
        13, 13, 13, 13,  1,  1,  0,  0,  0,  0,  0,  0,  5,  4,  3,  3,  3,
        3, 15, 15, 12, 12, 12, 12, 12, 12, 12, 12,  7,  8,  8,  8,  8,  8,
        8,  8,  8])
2736]
[18
array([ 0, 15, 14, 14, 15, 15, 15, 15, 15, 15, 17, 12, 12, 12, 12,  0,  0,

```

```

    0, 0, 0, 0, 0, 0, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 21,
    15, 15, 15, 15, 15, 15, 15, 13, 12, 12, 12, 12, 12, 12, 12, 12, 12,
    6, 0, 0, 0, 0, 0, 4, 3, 3, 3, 3, 3, 21, 15, 15, 15, 15, 15,
    15, 15, 15, 15, 15, 16, 17, 12, 12, 12, 12, 12, 12, 12, 18, 18, 18,
    18, 18, 18, 0, 0, 0, 0, 0, 1, 1, 1, 1, 3, 3, 3, 3, 3,
    15, 16, 12, 12, 12, 12, 12, 12, 12, 6, 1, 1, 1, 1, 1, 1, 1,
    1, 1])
1309]
[18
array([ 0, 15, 14, 14, 15, 15, 15, 15, 14, 14, 13, 12, 6, 6, 6, 6, 0,
        0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 5, 3, 3, 3, 3, 3, 3,
        21, 15, 15, 15, 15, 15, 15, 15, 13, 13, 12, 12, 12, 12, 12, 12, 12,
        12, 12, 13, 14, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15, 16,
        16, 16, 16, 17, 17, 12, 12, 12, 12, 12, 12, 12, 12, 18, 19, 1, 1,
        1, 0, 0, 0, 0, 0, 0, 0, 4, 4, 4, 4, 3, 3, 3, 3, 3, 3,
        15, 15, 12, 12, 12, 12, 12, 12, 12, 12, 12, 12, 15, 15, 15, 15, 15,
        15, 15, 15])
1305]
[18
array([ 0, 16, 14, 14, 14, 15, 14, 14, 14, 14, 12, 12, 6, 6, 6, 0, 0,
        0, 0, 0, 5, 4, 4, 4, 4, 4, 3, 2, 2, 2, 2, 2, 2, 2,
        3, 3, 3, 3, 15, 15, 15, 15, 15, 15, 15, 15, 12, 12, 12, 12, 12, 12,
        12, 12, 12, 12, 12, 6, 6, 7, 9, 9, 15, 15, 15, 15, 15, 15, 16,
        16, 17, 17, 12, 12, 12, 12, 12, 12, 12, 12, 18, 18, 18, 18, 18, 18, 0,
        0, 0, 1, 1, 1, 1, 1, 2, 3, 3, 3, 3, 9, 15, 16, 12, 12,
        12, 12, 12, 12, 12, 12, 8, 8, 8, 8, 8, 8, 8, 8])
1310]
[18
array([ 0, 23, 14, 15, 15, 15, 15, 15, 15, 15, 15, 14, 12, 12, 12, 12, 12,
        6, 6, 0, 0, 0, 0, 0, 0, 0, 1, 3, 3, 3, 3, 4, 4, 5,
        5, 0, 0, 0, 1, 1, 2, 2, 2, 3, 3, 3, 3, 15, 15, 15, 15,
        15, 15, 13, 12, 12, 12, 12, 13, 13, 14, 14, 15, 15, 15, 12, 12, 17,
        17, 17, 17, 12, 12, 12, 12, 17, 16, 16, 16, 16, 16, 16, 16, 16,
        16, 12, 12, 13, 13, 13, 19, 0, 0, 0, 0, 0, 0, 0, 5, 3, 3,
        3, 3, 15, 16, 12, 12, 12, 12, 12, 12, 12, 12, 6, 1, 1, 1, 1, 1,
        1, 1, 1, 1])
2724]
[18
array([ 0, 15, 15, 15, 15, 15, 15, 15, 15, 15, 12, 12, 6, 6, 0, 0, 0, 0,
        0, 5, 5, 5, 0, 0, 1, 2, 3, 3, 3, 3, 3, 21, 15, 15, 15,
        15, 15, 15, 13, 13, 12, 12, 12, 12, 12, 12, 12, 12, 12, 12, 0,
        0, 0, 0, 5, 4, 3, 3, 3, 9, 15, 15, 15, 15, 15, 15, 15, 15,
        15, 15, 17, 17, 17, 17, 17, 17, 16, 16, 16, 16, 16, 17, 12, 18, 18,
        18, 18, 0, 1, 1, 1, 1, 1, 2, 3, 3, 3, 3, 3, 3, 9, 16,
        17, 12, 12, 12, 12, 12, 12, 12, 12, 14, 15, 15, 15, 15, 15, 15,
        15])
1292]
[18

```

```

array([ 0,  8, 15, 15, 15, 15, 15, 12, 12, 12, 12, 12,  6,  0,  0,  0,  0,
        0,  0,  0,  0,  0,  1,  2,  3,  3,  3,  3,  3, 21, 21, 15, 15, 15,
       15, 15, 15, 13, 12, 12, 13, 13, 13, 13, 14, 14, 13, 13, 13, 13, 12,
       17, 16, 16, 16, 16, 16, 16, 17, 17, 12, 12, 12, 12, 18, 18,  0,  0,
        0,  0,  0,  0,  0,  0,  5,  3,  3,  3,  3,  9, 15, 16, 12, 12, 12,
       12, 12, 12, 12, 12, 14, 15, 15, 15, 15, 15, 15, 15, 15])
1278]
[18
array([ 0, 16, 14, 14,  8,  8,  8,  8,  8, 11, 11, 11, 11, 17, 17, 17, 12,
       12,  6,  0,  0,  0,  0,  0,  0,  0,  5,  5,  5,  5,  5,  4,  4,  3,
        3,  3,  3,  3,  3,  2,  9,  9, 15, 15, 15, 15, 15, 15, 16, 16,
       12, 12, 12, 12, 12, 13, 13, 14, 14, 14, 14, 14, 13, 12, 12, 17, 17,
       16, 16, 16, 16, 16, 16, 17, 17, 17, 12, 12, 12, 18, 19, 19, 19,  1,
        0,  0,  0,  0,  0,  0,  0,  0,  3,  3,  3,  3,  3,  9, 16, 12, 12,
       12, 12, 12, 12, 12,  6,  1,  1,  1,  1,  1,  1,  1,  1,  1])
1328]
[19
array([ 0,  1,  4,  4,  4,  0,  1,  1,  1,  1,  2,  9,  9, 10, 10, 10, 10,
       16, 16, 16, 16, 16, 16, 16, 23, 18, 19, 19, 19, 13, 13, 14, 14, 14,
       15, 15, 15, 15, 15, 15, 15, 16, 16, 16, 12, 12, 12, 13, 13, 12,  0,
        0,  0,  0,  0,  0,  0,  0,  3,  3,  3,  3,  3,  3,  3,  3,  4,  4,
        4,  4, 16, 16, 16, 15, 13, 13, 13, 13,  7,  7,  7,  1,  1,  1,  1,
        1,  1,  0,  5,  4,  4,  4,  4,  4,  4, 16, 16, 16, 16, 16, 16, 16,
       12, 12, 12, 13, 13, 13, 13, 12, 12, 12, 18, 18, 19, 19, 19, 19, 19,
       13,  7,  6, 11, 11, 11, 11, 11, 11, 23, 22, 22, 22, 22, 22, 22, 22,
       22, 22])
1388]
[19
array([ 0,  8,  8,  8,  7,  7,  7,  7,  6,  0,  0,  0,  0,  0,  0,  5,  4,
        4,  4,  4,  4, 22, 16, 16, 16, 16, 16, 16, 13, 13, 13, 13, 13, 13,
       13, 13, 13, 13, 12, 12, 23, 18, 19, 20, 15, 15, 15, 15, 15, 15, 16,
       16, 16, 16, 16, 16, 12, 12, 12, 12, 12, 12, 18,  0,  0,  1,  1,
        1,  1,  1,  1,  1,  1,  2,  3,  3,  3,  3,  4,  4,  4,  4,  5,
        0,  0,  4,  3,  3,  2,  8,  8,  7,  7,  7,  7,  7,  7,  1,  1,  0,
        0,  0,  5,  5,  4,  4,  4,  4,  3,  9, 16, 16, 16, 16, 16, 16, 16,
       17, 17, 17, 12, 18, 18, 18, 18, 18, 18, 19, 19, 19, 20, 20, 20,  8,
        8, 10, 11, 11, 11, 11, 11, 11, 11, 11,  8,  8,  8,  8,  8,  8,  8,
        8,  8])
1407]
[19
array([ 0,  1,  1,  2,  8,  9,  9, 10, 10, 10, 10, 10, 11, 11,  5,  5, 23,
       22, 22, 22, 22, 22, 22, 21, 15, 15, 15, 15, 15, 14, 14, 14, 14, 14,
       14, 14, 14, 13, 12, 12, 12, 12, 12, 12, 12, 12, 18, 18, 18,  0,  1,
        1,  1,  1,  1,  1,  1,  2,  3,  3,  3,  4,  4,  4,  4,  4,  4,
        3,  2,  2,  2,  2,  2,  1,  1,  1,  1,  1,  1,  1,  0,  5,  4,  4,
        4,  4, 10, 16, 16, 16, 16, 16, 12, 12, 12, 12, 13, 13, 18, 18, 22,
       22, 16, 15, 15, 15, 13, 13, 13, 13, 13, 13, 13, 13, 17, 12, 12, 19,
        1,  1,  2,  3,  4,  4,  4,  4,  4,  4,  4,  0,  0,  0,  0,  0,  0,

```

```

0, 0, 0))
2790]
[19
array([ 0,  7, 10, 10, 10, 10, 10, 10, 10, 10, 10, 10, 10, 16, 22, 22, 22,
       22, 22, 22, 22, 22, 21, 20, 14, 14, 14, 14, 14, 15, 15, 15, 15, 14,
       14, 13, 13, 13, 13, 13, 12, 12, 12, 12,  7,  1,  1,  1,  0,  0,  0,  5,
        4,  4,  4,  3,  3,  3,  3,  3,  3,  3, 21, 22, 21, 19,  1,  1,  1,  4,
        4,  4,  4,  1,  1,  1,  1,  1,  1,  1,  1,  1,  1,  1,  1,  1,  1,
        2,  3,  3,  3,  4, 10, 10, 10, 10, 10, 10, 10, 16, 16, 16, 16, 16, 16,
       16, 16, 16, 16, 12, 13, 13, 13, 13, 13, 13, 13, 13, 19, 19, 19, 19,
       19, 18, 23, 22, 22, 22, 22, 22, 19, 19, 19,  1,  1,  4,  4,  4,  4,
       10, 10, 10, 10, 10,  7,  7,  7,  7,  7,  7,  7,  7,  7,  7])
2817]
[19
array([ 0,  8,  8,  8,  8,  8,  7,  7,  7,  7,  6,  6,  0,  0,  5,  5,  4,
        4,  4,  4,  4,  3,  9, 15, 16, 16, 16, 16, 16, 17, 17, 17, 23, 23,
       23, 18, 19, 19, 19, 19, 19, 19, 19, 19, 20, 15, 15, 15, 15, 15, 14, 14,
       14, 15, 15, 15, 15, 16, 16, 16, 17, 12, 12, 12, 12, 18, 18, 19,  1,
        1,  1,  1,  1,  1,  1,  3,  3,  3,  3,  4,  4,  4,  4,  4,  4,
        3,  3,  3,  3,  3,  3,  1,  1,  1,  1,  1,  1,  1,  1,  1,  1,
        0,  4,  4,  4,  4,  4, 10, 10, 10, 16, 16, 16, 16, 16, 16, 16, 17,
       17, 17, 18, 18, 18, 19, 19, 19, 19, 19, 19, 22, 23, 18, 19, 19, 19,
       19, 19, 20,  2,  8,  8, 10, 10, 11, 11, 11, 11, 11, 11, 11, 11,  7,
        7,  7,  7,  7,  7,  7,  7,  7])
1417]
[19
array([ 0, 16,  7,  7,  7,  7,  7,  7,  7,  7,  6, 10, 10, 10, 10, 10,  4,
        4,  4,  4, 23, 23, 22, 22, 22, 22, 22, 22, 21, 21, 15, 15, 14,
       13, 13, 13, 13, 13, 13, 13, 13, 14, 14, 14, 14, 14, 14, 14, 13, 13,
       13, 17, 16, 16, 16, 16, 16, 16, 16, 16, 16, 16, 16, 16, 13, 13,
       13, 13, 13, 19, 19,  1,  1,  1,  1,  1,  1,  3,  4,  4,  4,  4,
        4,  4,  4,  4,  4,  4,  3,  1,  1,  1,  1,  1,  1,  3,  3,  9,
        9,  9, 10, 10, 10, 10, 16, 17, 17, 17, 16, 16, 16, 16, 16, 16,
       16, 17, 12, 12, 12, 18, 18, 18, 18, 18, 18, 22, 22, 22, 21, 20, 19,
       13, 13,  7,  7, 11, 11, 11, 11, 11, 11, 10, 10, 16, 15, 15, 15, 15,
       15, 15, 15, 15])
2800]
[19
array([ 0,  7,  6, 11, 11, 11,  6,  0,  0,  5,  5,  5,  4,  4,  4,  4,  4,
        4,  4,  4, 22, 22, 16, 16, 16, 16, 16, 16, 13, 13, 13, 13, 13,
       13, 13, 13, 14, 14, 14, 14, 15, 15, 15, 15, 16, 16, 16, 16, 12, 12,
       12, 12, 12, 12,  0,  0,  0,  0,  0,  1,  1,  1,  3,  3,  3,  3,  3,
        3,  4,  4,  4,  3,  3,  3,  3,  3,  3,  9,  9,  9,  9,  8,  7,  7,
        7,  7,  7,  7,  7,  7,  7,  7,  7,  7,  6, 11, 11, 11,  5,  5,  5,
        4,  4,  4,  4, 22, 22, 22, 22, 22, 22, 22, 22, 21, 20, 20, 20, 13, 13,
       13, 13, 13, 19, 18, 18, 18, 18, 18, 19, 19, 20, 20,  8,  8, 10, 11,
       11, 11, 11, 11, 11, 11,  7,  7,  7,  7,  7,  7,  7,  7,  7])
1403]

```

[19

```
array([ 0,  7,  8,  8,  7,  7,  7,  7,  6,  6,  6,  0,  0,  0,  0,  5,  5,
        4,  4,  4,  4,  4,  3, 21, 21, 15, 15, 15, 16, 16, 16, 16, 16, 17,
       17, 17, 12, 13, 13, 13, 13, 13, 13, 13, 15, 15, 15, 15, 15, 15, 15,
       15, 15, 15, 15, 15, 16, 17, 12, 12, 12, 12, 13, 13, 13, 12, 12, 12,
       12, 12,  0,  0,  0,  0,  0,  0,  0,  0,  0,  0,  4,  3,  3,  3,  3,  4,
        4,  3,  3,  3,  3, 15, 15, 15, 15, 13, 13,  7,  7,  7,  7,  7,  7,
        7,  7,  7,  7,  7, 11, 10, 10, 10, 10, 10, 10, 10, 10, 22, 22, 22,
       22, 22, 22, 22, 22, 22, 21, 14, 13, 13, 13, 13, 13, 13, 13, 15, 16,
       16, 16, 17, 23, 23, 18, 18, 19, 19, 19,  2,  8,  8, 10, 10, 10, 10,
       11, 11, 11, 11, 11,  7,  7,  7,  7,  7,  7,  7,  7,  7])
```

1414]

[19

```
array([ 0,  7,  7,  7,  7, 11, 10, 10, 10, 10, 10, 10, 22, 22, 22, 22, 22,
       22, 16, 16, 15, 15, 14, 14, 14, 14, 14, 14, 15, 16, 17, 17, 17, 17,
       17, 17, 12, 12, 12, 12, 12, 12, 19,  1,  1,  1,  1,  1,  1,  1,  3,  3,
        3,  3,  3,  3,  4,  4,  4,  4,  4,  4,  4,  4,  4,  1,  1,  1,  1,
        1,  1,  1,  1,  0,  0,  5,  4,  4,  3,  3,  3,  2,  2,  1,  0,  0,
        5,  4,  4,  4,  4, 22, 22, 16, 16, 16, 16, 16, 17, 13, 13, 13, 13,
       13, 13, 13, 13, 18, 18, 18, 19, 19, 19, 23, 18, 19, 19, 20,  8,  8,
       11, 11, 11, 11, 11, 11, 11, 11,  8,  8,  8,  8,  8,  8,  8,  8,  8])
```

2781]

[19

```
array([ 0,  1,  0,  4,  4,  4,  4,  4,  4,  4,  3,  1,  1,  1,  0,  4,  4,  4,
       22, 22, 16, 16, 16, 16, 16, 13, 13, 13, 13, 13, 14, 14, 14, 15, 15,
       16, 17, 17, 17, 12, 13, 13, 13, 13, 13, 13, 13, 13,  7,  7,  0,
        0,  0,  0,  0,  0,  4,  3,  3,  3,  3,  4,  4,  4,  4,  4, 22,
       16, 16, 15, 14, 13, 13,  7,  7,  7,  7,  7,  7,  0,  0,  0,  0,  0,
        5,  4,  4,  4,  3,  3,  4, 10, 16, 16, 16, 16, 16, 16, 16, 16, 16,
       17, 12, 12, 13, 13, 13, 19, 19, 19, 19, 19, 19, 19, 19,  1,  8,  9,
       10, 10, 10, 10, 10, 10, 10,  5,  1,  1,  1,  1,  1,  1,  1,  1,  1])
```

1384]

[19

```
array([ 0,  1,  2,  8,  7,  7,  7,  7,  7, 10, 10, 10, 10, 10, 10, 10, 10,
       16, 16, 16, 16, 16, 16, 16, 16, 22, 23, 18, 19, 19, 19, 13, 13, 14,
       14, 15, 15, 16, 16, 16, 16, 16, 16, 15, 15, 14, 13, 13, 13, 13, 13,
       13,  1,  1,  1,  0,  0,  0,  0,  4,  4,  4,  4,  4,  4,  4,  4,  4,
        4,  4,  4,  3,  3, 15, 15,  7,  6, 11, 16, 16, 17, 13, 13, 13, 13,
        7,  7,  7,  7,  7,  7,  7,  7,  7,  7,  7,  7,  7,  7,  7,  0,  4,
       10, 10, 10, 10, 10, 10, 10, 16, 22, 22, 22, 22, 22, 22, 22, 22, 21,
       19, 19, 19, 19, 19, 19, 19, 19, 19, 19, 19, 19, 21, 22, 22, 22, 23,
       23, 23, 23, 19, 19, 19,  7,  8, 10, 10, 10, 10, 10, 10, 10, 10, 10,
        7,  7,  7,  7,  7,  7,  7,  7,  7])
```

2838]

[19

```
array([ 0, 16, 13,  7,  7,  7,  8,  8,  8,  7,  7,  6,  6,  6,  0,  0,  0,
        0,  0,  0,  0,  0,  4,  4,  4,  4,  4, 16, 16, 16, 15, 15, 15, 14,
       13, 12, 12, 12, 12, 12, 12, 18, 18,  1,  1,  1,  1,  2,  3,  3, 15,
```

```

15, 15, 15, 15, 15, 16, 16, 12, 12, 12, 12, 12, 0, 0, 0, 0, 0,
0, 0, 0, 1, 1, 2, 3, 3, 3, 3, 3, 3, 3, 3, 4, 5, 0,
1, 1, 1, 1, 1, 1, 1, 1, 1, 2, 2, 3, 3, 9, 10, 10, 10,
16, 16, 16, 16, 16, 16, 17, 17, 12, 13, 13, 13, 13, 19, 19, 19, 19,
19, 19, 1, 1, 1, 1, 1, 0, 0, 4, 3, 3, 15, 15, 13, 12, 12,
12, 12, 12, 12, 12, 12, 15, 15, 15, 15, 15, 15, 15, 15, 15])
1347]
[19
array([ 0,  7,  7,  7,  7,  7,  7,  7,  7,  7,  7,  6,  6, 11,  5,  5,  4,  4,
        4,  4,  4,  4, 22, 22, 22, 22, 16, 16, 16, 15, 14, 13, 13, 13, 13,
       13, 13, 13, 13, 13, 13, 13, 13, 14, 16, 16, 16, 12, 12, 12, 12, 12,
       12,  0,  0,  0,  1,  1,  1,  1,  1,  3,  3,  3,  3,  3,  3,  3,  3,
        4,  4,  4,  4,  4,  4,  4,  4, 22, 22, 16, 15, 13, 13, 13,  1,  1,  1,
        1,  1,  1,  1,  1,  1,  4,  4,  4,  4,  4, 10, 10, 16, 16, 16, 16,
       16, 16, 17, 17, 12, 12, 13, 13, 19, 19, 19, 19, 19, 19, 20, 20, 13,
       13,  7,  1,  0,  4,  4,  4,  4,  4,  4,  4,  4,  1,  1,  1,  1,  1,
        1,  1,  1,  1])
1371]
[19
array([ 0, 22, 13,  7,  7,  7,  7,  7,  7,  7,  7,  7,  6,  0,  0,  0,  0,
        0,  0,  0,  4,  4,  4,  4,  4, 22, 16, 16, 16, 16, 16, 15, 14, 13,
       13, 13, 13, 13, 13, 13, 12, 12, 13, 15, 15, 15, 15, 15, 15, 15, 15,
       13, 13, 13, 13, 13,  6,  0,  0,  0,  0,  0,  0,  5,  4,  3,  3,  3,
        3,  3,  3,  3,  3,  3,  3,  3,  9,  9,  9, 15, 15, 15, 12, 12,  6,
        6,  6,  0,  5,  4,  4, 22, 22, 16, 16, 16, 16, 16, 13, 13, 13, 13,
       13, 19, 19, 19, 19, 19, 19, 19, 2,  8,  8, 10, 11, 11, 11, 11, 11,
       11, 11,  0,  1,  1,  1,  1,  1,  1,  1,  1,  1])
1346]
[19
array([ 0,  1,  1,  1,  1,  1,  1,  1,  0,  4,  4,  4,  4,  4,  4, 10, 16,
       16, 16, 16, 16, 17, 12, 12, 12, 18, 19, 19, 19, 19, 19, 19, 19,
       19, 19, 19, 14, 15, 16, 16, 16, 16, 16, 16, 16, 16, 16, 16, 12, 12,
       12, 12, 12, 12, 13, 19, 19,  1,  1,  1,  1,  1,  1,  1,  1,  1,
        3,  3,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  1,  1,  1,  1,  1,
        2,  3,  2,  1,  1,  1,  1,  1,  7,  7,  7,  7,  7,  7,  7, 11, 10,
       10, 10, 10, 10, 10, 10, 16, 16, 16, 16, 16, 16, 22, 23, 19, 19,
       19, 19, 19, 19, 19, 19, 19, 19, 19, 19, 22, 23, 23, 23, 19, 19,
       20,  8,  8, 11, 11, 11, 11, 11, 11, 11, 11, 11,  7,  7,  7,  7,  7,
        7,  7,  7,  7])
2846]
[19
array([ 0,  1,  2,  3,  3,  9, 10, 10, 10, 10, 10, 10, 16, 16, 16, 16, 16,
       16, 16, 16, 16, 17, 12, 13, 13, 13, 13, 13, 13, 13, 13, 13,
       13, 14, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15, 13, 13, 12, 12,
       12, 12, 12,  0,  0,  0,  0,  0,  0,  1,  1,  1,  3,  3,  3,  3,  3,
        3,  3,  3,  4,  4,  4, 22, 22, 20, 19,  1,  1,  1,  1,  1,  1,  1,
        1,  1,  1,  1,  1,  0,  4,  4,  4,  4,  4,  4,  4,  4, 10, 10,
       16, 16, 16, 16, 16, 16, 16, 16, 16, 16, 17, 12, 13, 13, 13, 13,

```

```

19, 19, 19, 19, 19, 19, 19, 21, 22, 22, 19, 19, 1, 1, 4, 4, 10,
10, 10, 10, 10, 10, 7, 7, 7, 7, 7, 7, 7, 7, 7])
1391]
[19
array([ 0, 1, 1, 7, 8, 8, 8, 8, 7, 7, 11, 10, 10, 4, 4, 4, 22,
22, 22, 22, 22, 22, 21, 19, 19, 19, 19, 13, 13, 14, 15, 15, 15,
15, 15, 15, 15, 14, 13, 12, 12, 12, 12, 12, 12, 0, 0, 0, 1, 1,
1, 1, 1, 3, 3, 3, 3, 3, 3, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4,
4, 4, 4, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,
1, 1, 1, 1, 1, 1, 3, 4, 4, 4, 10, 10, 16, 16, 16, 16, 16,
16, 17, 12, 12, 12, 12, 19, 19, 19, 19, 19, 19, 19, 19, 19, 19,
19, 19, 23, 22, 22, 22, 22, 22, 19, 19, 19, 7, 7, 11, 10, 10, 10,
10, 10, 10, 10, 10, 7, 7, 7, 7, 7, 7, 7, 7, 7])
2852]
[19
array([ 0, 7, 7, 7, 6, 6, 7, 6, 0, 0, 0, 5, 4, 4, 4, 4, 4,
22, 16, 16, 16, 16, 16, 15, 14, 13, 13, 13, 13, 13, 13, 12, 12,
12, 12, 12, 17, 16, 15, 15, 16, 12, 12, 13, 13, 19, 19, 19, 1, 1,
1, 1, 1, 1, 1, 2, 3, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4,
4, 4, 4, 16, 16, 15, 15, 13, 12, 12, 1, 1, 1, 1, 1, 1, 1, 1,
1, 3, 3, 9, 9, 9, 10, 10, 16, 16, 17, 17, 12, 18, 18, 0, 0,
0, 4, 22, 22, 22, 15, 15, 16, 16, 16, 16, 13, 13, 13, 13, 13, 13,
13, 19, 19, 18, 22, 22, 22, 22, 22, 22, 22, 22, 19, 19, 19, 1, 1,
4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 7, 7, 7, 7, 7, 7, 7, 7, 7,
7])
2794]
[19
array([ 0, 7, 9, 9, 8, 7, 7, 6, 6, 6, 0, 0, 0, 0, 5, 4, 4,
4, 4, 22, 22, 16, 16, 16, 16, 15, 13, 13, 13, 13, 13, 13, 13,
14, 14, 15, 15, 15, 15, 15, 15, 16, 16, 16, 17, 12, 12, 12, 12, 18,
18, 0, 0, 1, 1, 1, 1, 1, 2, 3, 3, 3, 3, 3, 3, 4, 4, 4,
3, 3, 3, 3, 3, 15, 15, 15, 12, 6, 0, 0, 0, 1, 1, 1, 1,
1, 7, 7, 7, 7, 7, 7, 7, 7, 7, 7, 6, 0, 0, 5, 5, 4,
4, 4, 4, 3, 9, 16, 16, 16, 16, 16, 16, 16, 17, 17, 12, 13, 13,
19, 19, 19, 19, 19, 19, 19, 19, 21, 22, 22, 22, 22, 22, 21, 20, 20,
20, 7, 7, 11, 11, 10, 10, 10, 10, 10, 10, 10, 8, 8, 8, 8, 8,
8, 8, 8, 8])
1405]
[19
array([ 0, 7, 7, 7, 7, 6, 11, 11, 11, 11, 4, 4, 4, 4, 22, 22, 22,
22, 22, 22, 19, 19, 19, 19, 19, 19, 19, 20, 21, 21, 21, 15, 15,
14, 13, 13, 13, 13, 14, 15, 15, 15, 15, 15, 16, 16, 16, 16, 17,
16, 16, 16, 16, 16, 17, 17, 18, 19, 19, 19, 19, 1, 1, 1, 1,
1, 2, 2, 2, 2, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 3,
9, 9, 10, 11, 0, 0, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,
4, 4, 4, 4, 4, 10, 10, 16, 16, 16, 16, 16, 16, 16, 16, 17, 12,
12, 19, 19, 19, 19, 19, 19, 1, 1, 3, 3, 21, 21, 22, 16, 15, 14,
13, 13, 13, 7, 7, 10, 10, 10, 10, 10, 4, 10, 16, 15, 15, 15, 15,

```



```

        15, 15, 15, 15, 15])
2797]
[19
array([ 0,  1,  4,  4,  4, 10, 10, 10, 16, 16, 16, 16, 16, 16, 17, 17, 12,
       13, 19, 19, 19, 19, 19, 20, 21, 15, 15, 15, 15, 15, 15, 14, 13, 13,
       13, 13, 13, 13,  7,  6,  0,  0,  0,  0,  0,  0,  0,  0,  1,  3,  4,
        4,  4,  3,  3,  3,  4,  4,  4,  3,  1,  1,  1,  1,  1,  1,  1,  1,
        1,  1,  1,  0,  0,  0,  5,  4,  4,  4,  4,  4, 10, 16, 16, 16, 16,
       16, 16, 17, 12, 12, 13, 13, 13, 13, 19, 19, 19, 19, 19, 19, 20, 21, 21,
       21, 19, 19, 19, 13, 13, 13, 13, 13, 15, 16, 16, 16, 16, 16, 16, 13, 13,
       13,  7,  1,  5,  4,  4,  4,  4,  4,  4,  4,  4,  1,  1,  1,  1,  1,
        1,  1,  1,  1])
2828]]

```

## 2 Character Recognition HMM

### 2.1 HMM Learn

- hmmlearn Tutorial
  - <https://hmmlearn.readthedocs.io/en/latest/tutorial.html>
- MultinomialHMM API Reference
  - <https://hmmlearn.readthedocs.io/en/latest/api.html#multinomialhmm>

```

[6]: from hmmlearn import hmm
import time

models = np.empty([num_keys], dtype=object)
idx = np.zeros(num_keys + 1, dtype=int)
for i in range(num_keys):
    models[i] = hmm.MultinomialHMM(n_components=num_features, verbose=False,
    ↪n_iter=1)

for i in range(train_data.shape[0]):
    idx[train_data[i][0]+1] = i+1;

# multinomial HMM learn
for key in range(num_keys):
    start_time = time.time()
    trainRange = range(idx[key], idx[key+1])
    print('Training', keys[key], 'model w.', idx[key+1]-idx[key], 'examples',
    ↪end=' ')

    trainX = np.concatenate([train_data[i][1].reshape(-1, 1) for i in
    ↪trainRange])
    lengths = [len(train_data[i][1]) for i in trainRange]

```

```
models[key].fit(trainX, lengths)
print("(elapsed time: {}s)".format(time.time() - start_time))
```

```
Training ['a'] model w. 152 examples (elapsed time: 3.0301613807678223s).
Training ['b'] model w. 127 examples (elapsed time: 2.4677369594573975s).
Training ['c'] model w. 125 examples (elapsed time: 1.5339748859405518s).
Training ['d'] model w. 143 examples (elapsed time: 2.569286346435547s).
Training ['e'] model w. 166 examples (elapsed time: 2.651658058166504s).
Training ['g'] model w. 127 examples (elapsed time: 2.311516284942627s).
Training ['h'] model w. 115 examples (elapsed time: 1.9165465831756592s).
Training ['l'] model w. 159 examples (elapsed time: 1.662139892578125s).
Training ['m'] model w. 120 examples (elapsed time: 2.5493650436401367s).
Training ['n'] model w. 114 examples (elapsed time: 1.9243998527526855s).
Training ['o'] model w. 128 examples (elapsed time: 2.1565144062042236s).
Training ['p'] model w. 117 examples (elapsed time: 2.1823959350585938s).
Training ['q'] model w. 117 examples (elapsed time: 2.486503839492798s).
Training ['r'] model w. 103 examples (elapsed time: 1.805945634841919s).
Training ['s'] model w. 119 examples (elapsed time: 2.202939510345459s).
Training ['u'] model w. 123 examples (elapsed time: 2.5348267555236816s).
Training ['v'] model w. 133 examples (elapsed time: 2.330547571182251s).
Training ['w'] model w. 109 examples (elapsed time: 1.9894249439239502s).
Training ['y'] model w. 125 examples (elapsed time: 2.2205615043640137s).
Training ['z'] model w. 150 examples (elapsed time: 3.272611141204834s).
```

```
[7]: testSize = test_data.shape[0]
wrongCases = 0

print('Wrong Cases')
for i in range(testSize):
    testX = np.concatenate([test_data[i][1].reshape(-1, 1)])

    maxScore = models[0].score(testX)
    maxKey = 0

    for key in range(num_keys):
        score = models[key].score(testX)
        if maxScore < score:
            maxScore = score
            maxKey = key

    print(keys[test_data[i][0]], keys[maxKey], maxScore, test_data[i][0] ==
↪maxKey)

    if not test_data[i][0] == maxKey:
        wrongCases += 1
        disp1 = mixouts[test_data[i][2]][:, :2]
        disp2 = mixouts[train_data[idx[maxKey]][2]][:, :2]
```

```

plt.subplot('121')
plot_disp(displ, displ.shape[0])

plt.subplot('122')
plot_disp(displ2, displ2.shape[0])
plt.show()

print('(Wrong, Total)', (wrongCases, testSize))
print('Accuracy: {}'.format((1 - wrongCases/testSize) * 100))

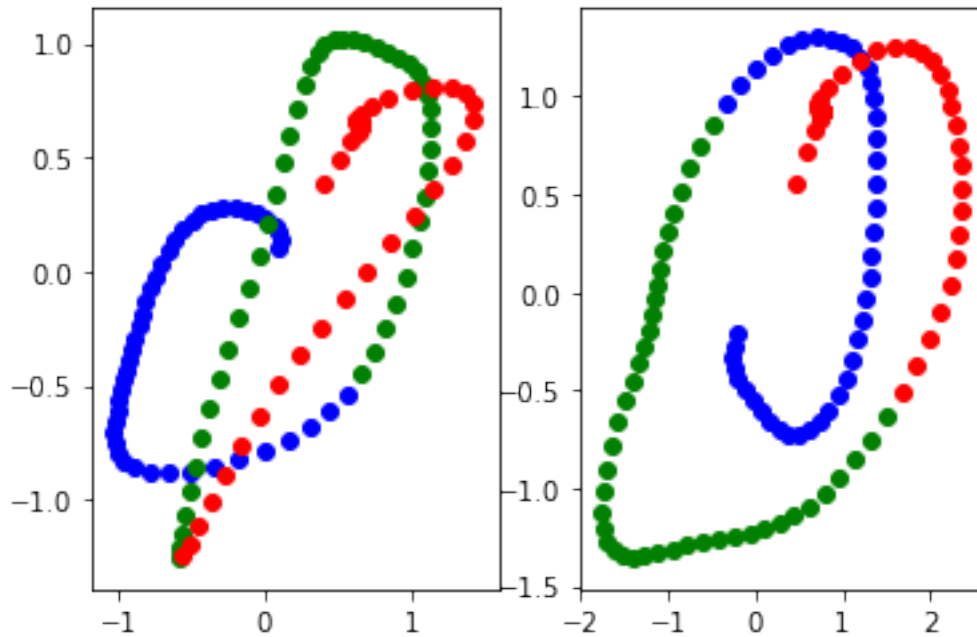
```

Wrong Cases

```

['a'] ['a'] -369.9831909872439 True
['a'] ['a'] -340.875432927826 True
['a'] ['e'] -395.4954447097437 False
['a'] ['e'] -395.4954447097437

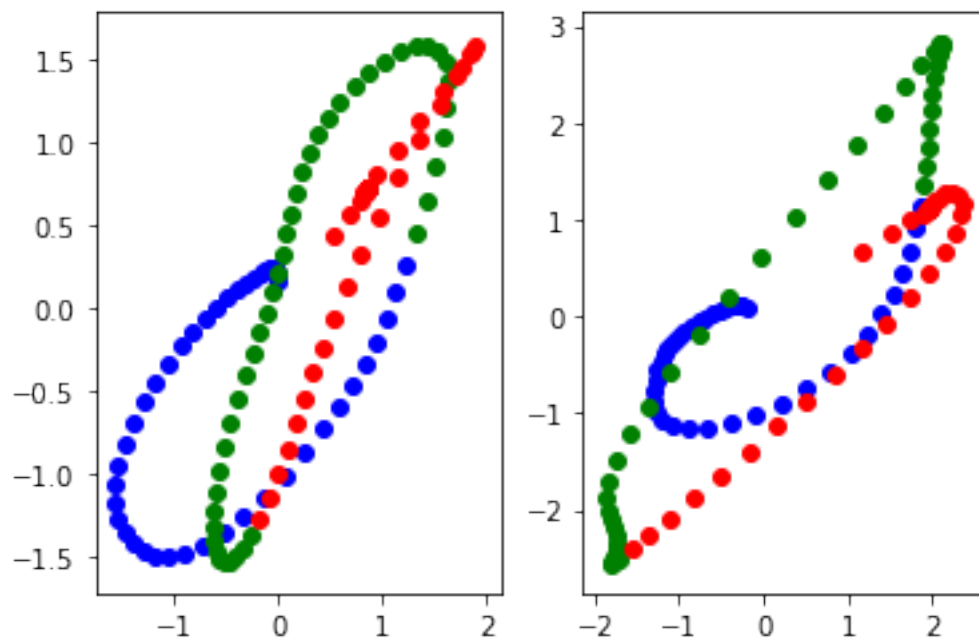
```



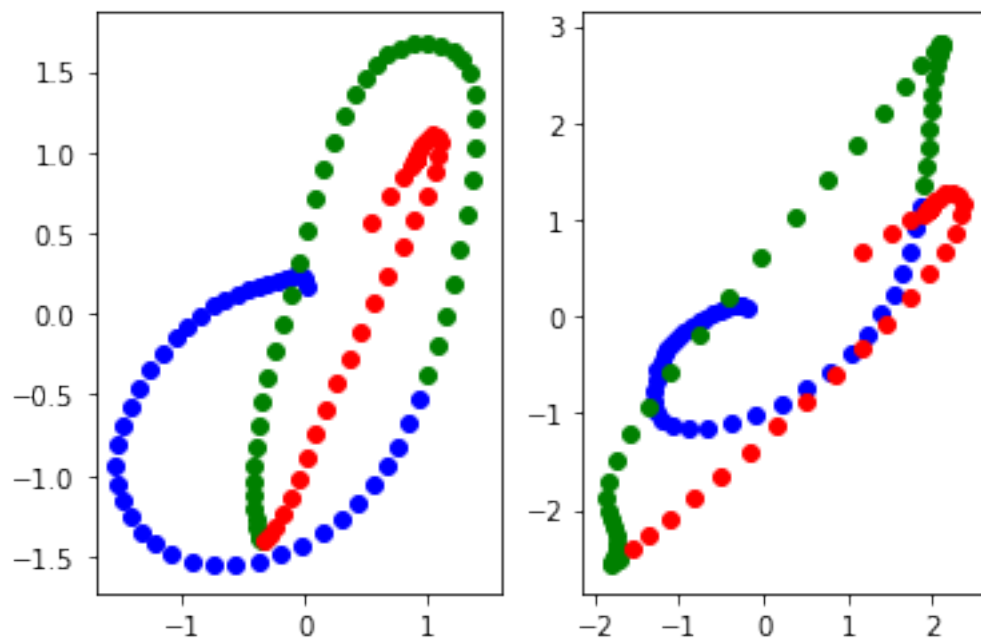
```

['a'] ['a'] -350.38173854087205 True
['a'] ['a'] -362.9314320720084 True
['a'] ['a'] -346.893958162919 True
['a'] ['a'] -316.95682156180663 True
['a'] ['a'] -400.5218420665217 True
['a'] ['a'] -341.7084909401679 True
['a'] ['d'] -328.3264401980213 False
['a'] ['d'] -328.3264401980213

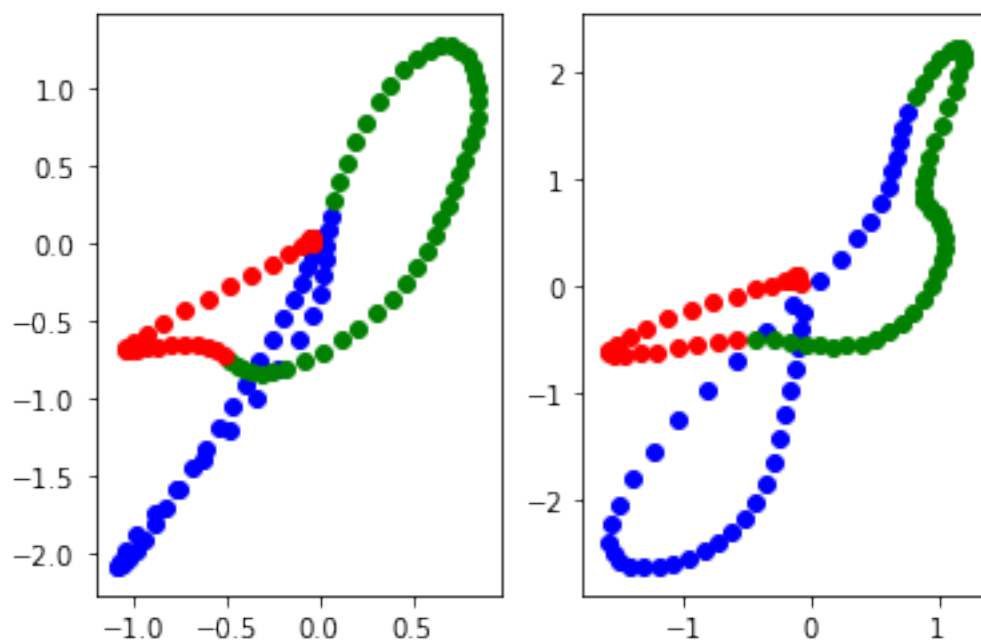
```



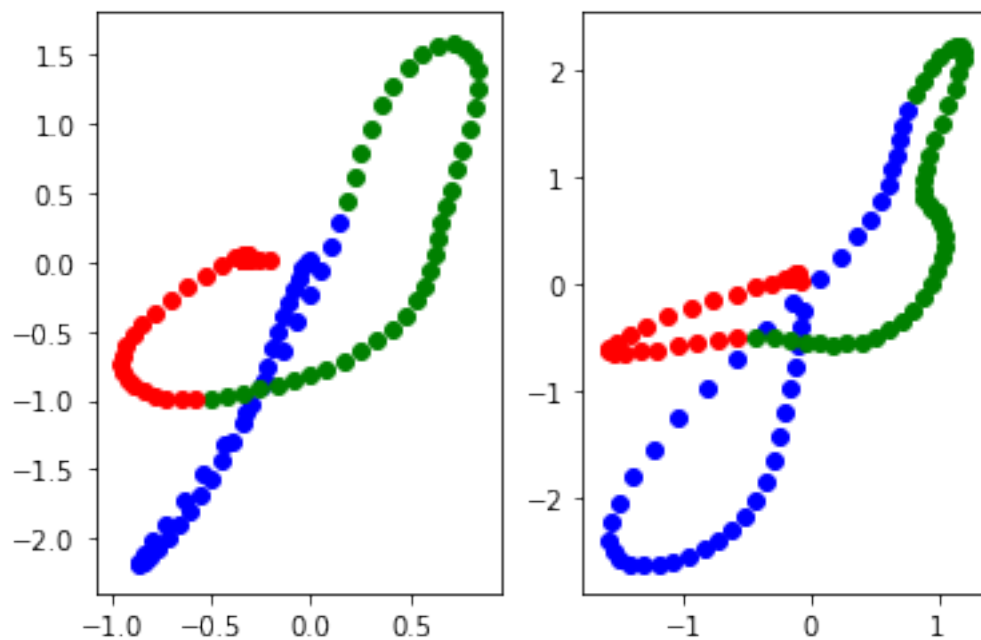
```
['a'] ['a'] -370.6998700712117 True
['a'] ['a'] -378.47867275214736 True
['a'] ['a'] -382.7623581762596 True
['a'] ['a'] -309.5425186025552 True
['a'] ['a'] -293.2976698263832 True
['a'] ['a'] -408.6489966714197 True
['a'] ['a'] -315.364518901708 True
['a'] ['a'] -379.2786470882245 True
['a'] ['d'] -334.7136319942661 False
['a'] ['d'] -334.7136319942661
```



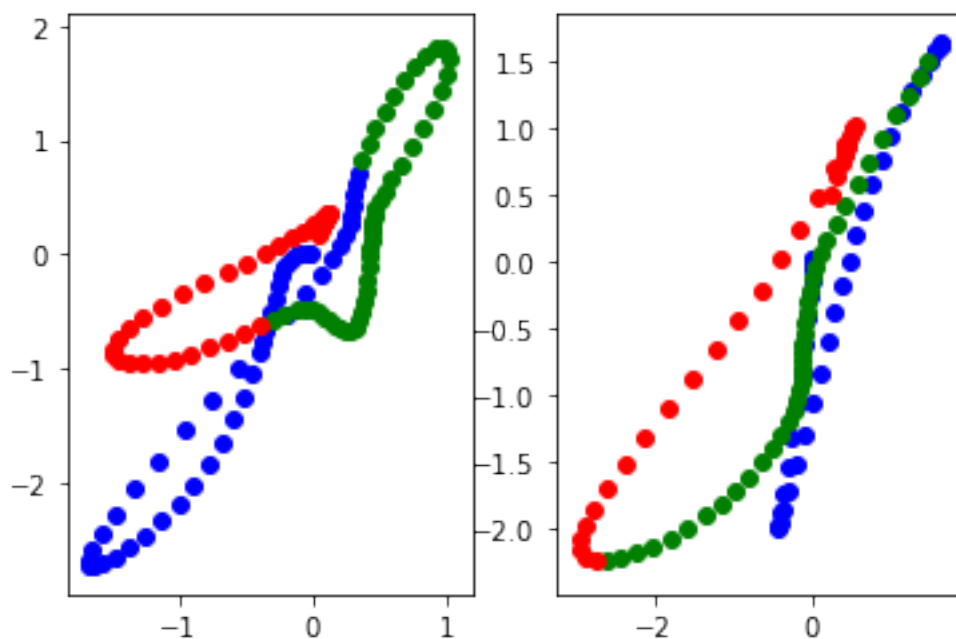
```
['b'] ['p'] -361.9956586518528 False
['b'] ['p'] -361.9956586518528
```



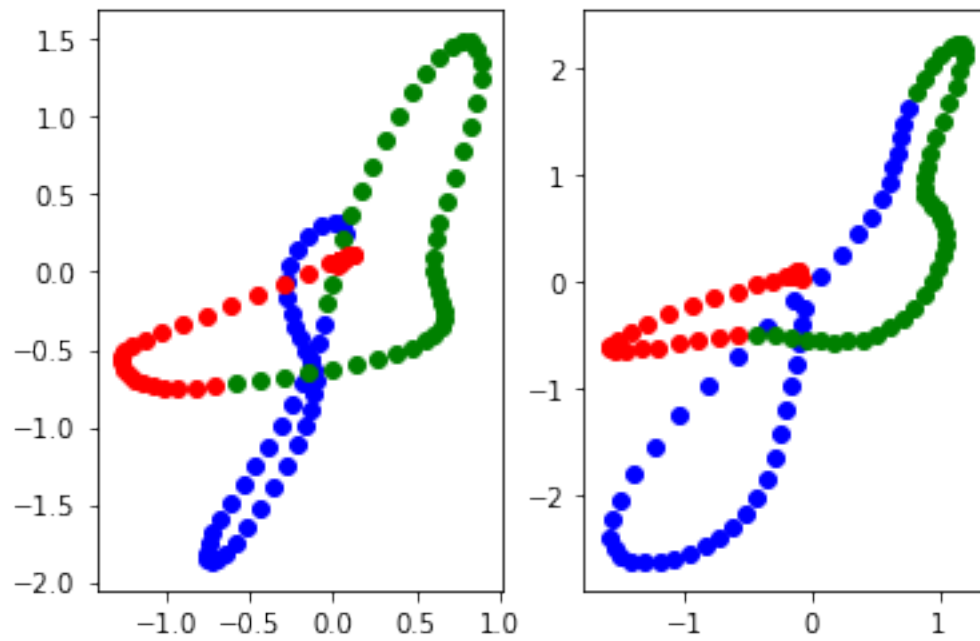
```
['b'] ['p'] -317.4227215013658 False
['b'] ['p'] -317.4227215013658
```



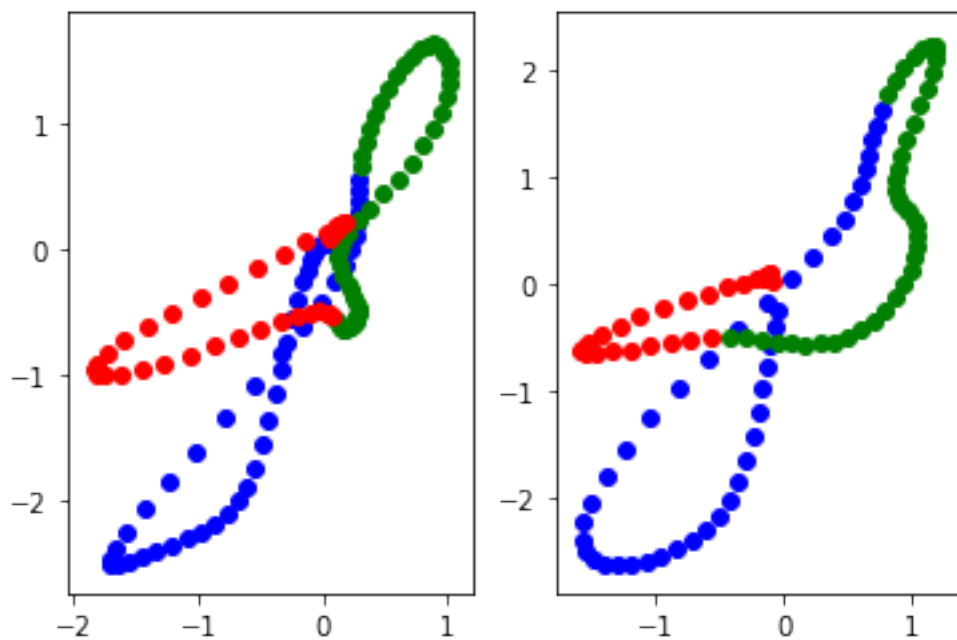
```
['b'] ['b'] -343.6835504935919 True
['b'] ['b'] -342.12102705361946 True
['b'] ['b'] -382.2775465780583 True
['b'] ['b'] -345.91512290586377 True
['b'] ['y'] -368.1915693200781 False
['b'] ['y'] -368.1915693200781
```



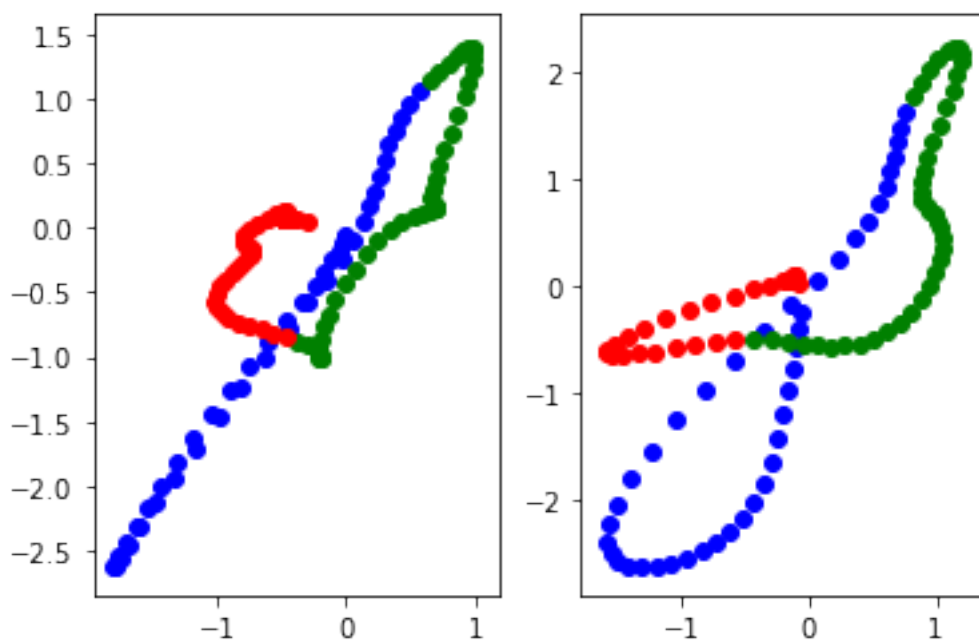
```
['b'] ['b'] -397.33883266556705 True
['b'] ['p'] -377.17441224877126 False
['b'] ['p'] -377.17441224877126
```



```
['b'] ['p'] -413.0869671370082 False
['b'] ['p'] -413.0869671370082
```



```
['b'] ['b'] -370.58388705805925 True
['b'] ['b'] -344.4863433974634 True
['b'] ['p'] -413.22918011240023 False
['b'] ['p'] -413.22918011240023
```

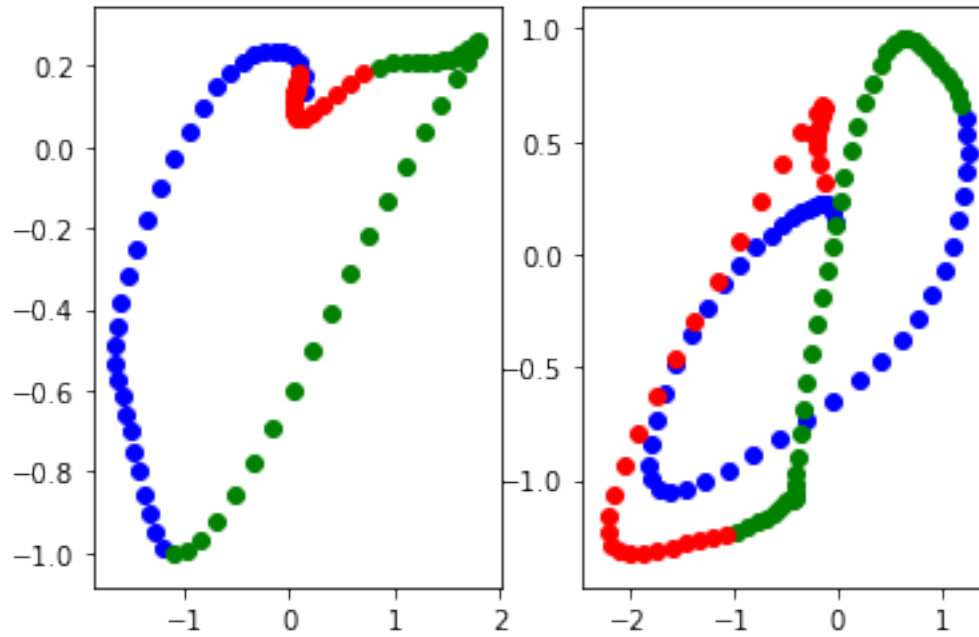




```

['b'] ['b'] -400.6922667022846 True
['c'] ['c'] -239.89451808837032 True
['c'] ['c'] -203.6983879867814 True
['c'] ['c'] -230.03362809690753 True
['c'] ['g'] -273.68609193727104 False
['c'] ['g'] -273.68609193727104

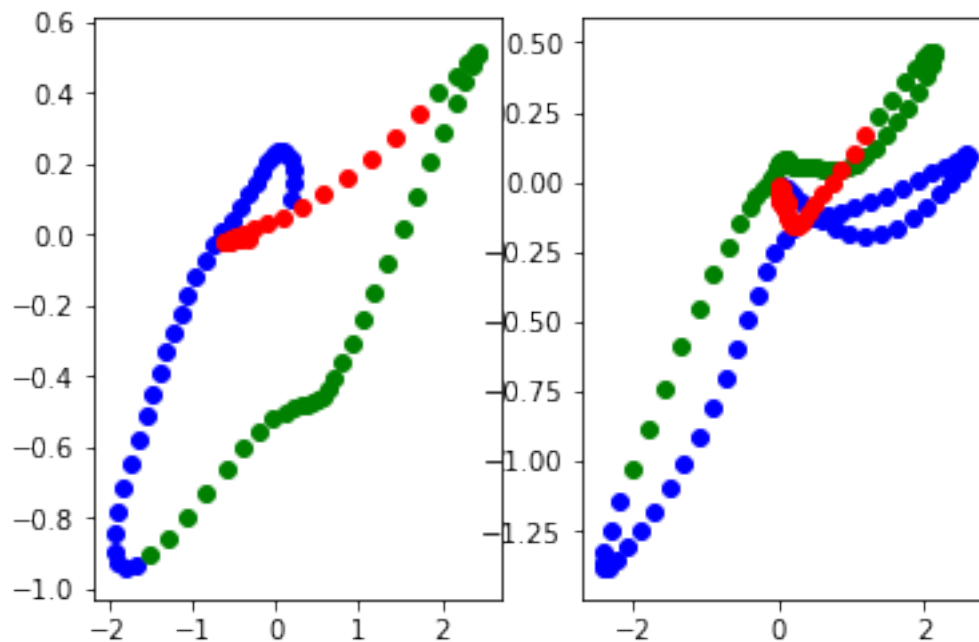
```



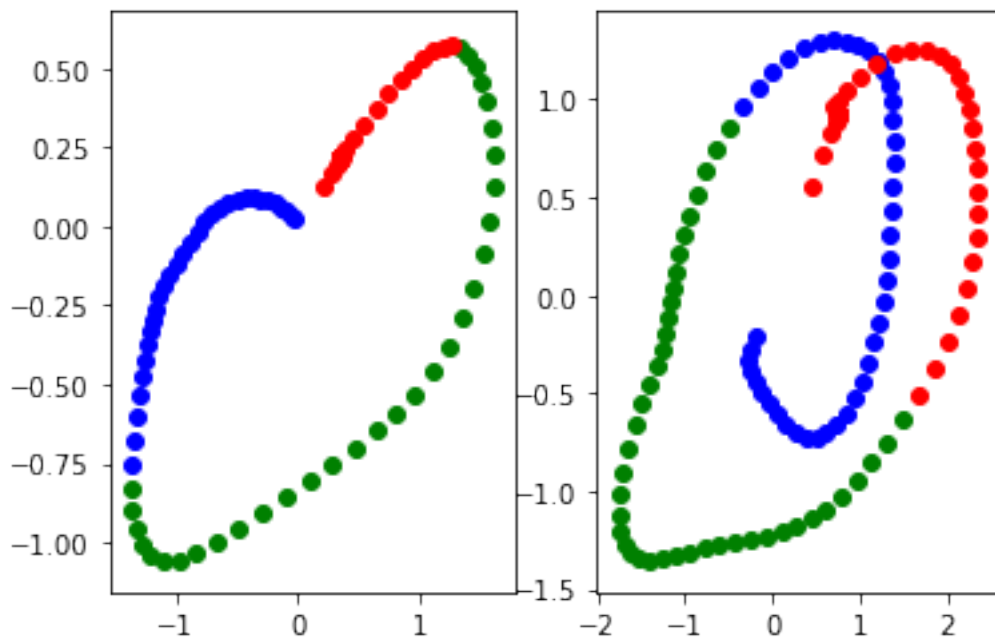
```

['c'] ['c'] -218.38043797227033 True
['c'] ['c'] -252.55669827817593 True
['c'] ['c'] -213.93673471413 True
['c'] ['c'] -246.25691748177098 True
['c'] ['c'] -251.6491442564118 True
['c'] ['c'] -194.52097511120778 True
['c'] ['z'] -284.333965792065 False
['c'] ['z'] -284.333965792065

```

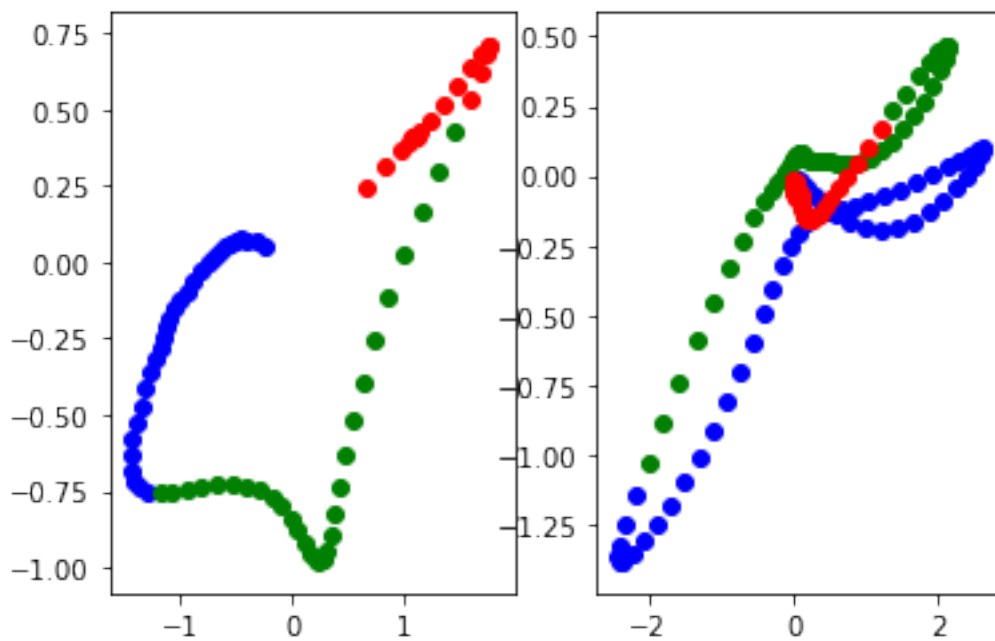


```
['c'] ['e'] -229.19616417963545 False
['c'] ['e'] -229.19616417963545
```



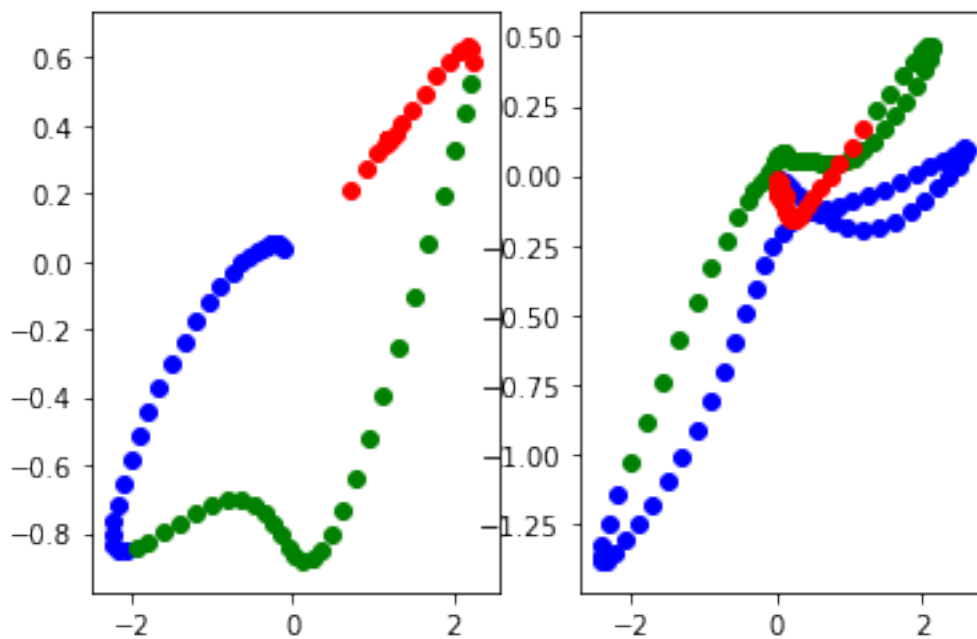
```
['c'] ['c'] -202.2435662939607 True
['c'] ['z'] -263.7784737509625 False
```

['c'] ['z'] -263.7784737509625

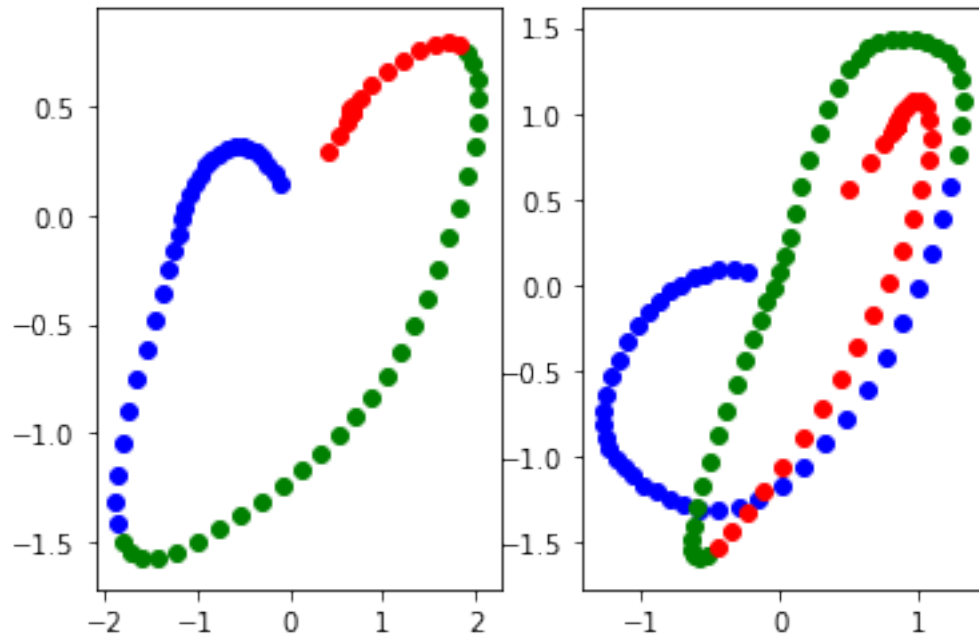


['c'] ['z'] -248.05338039929808 False

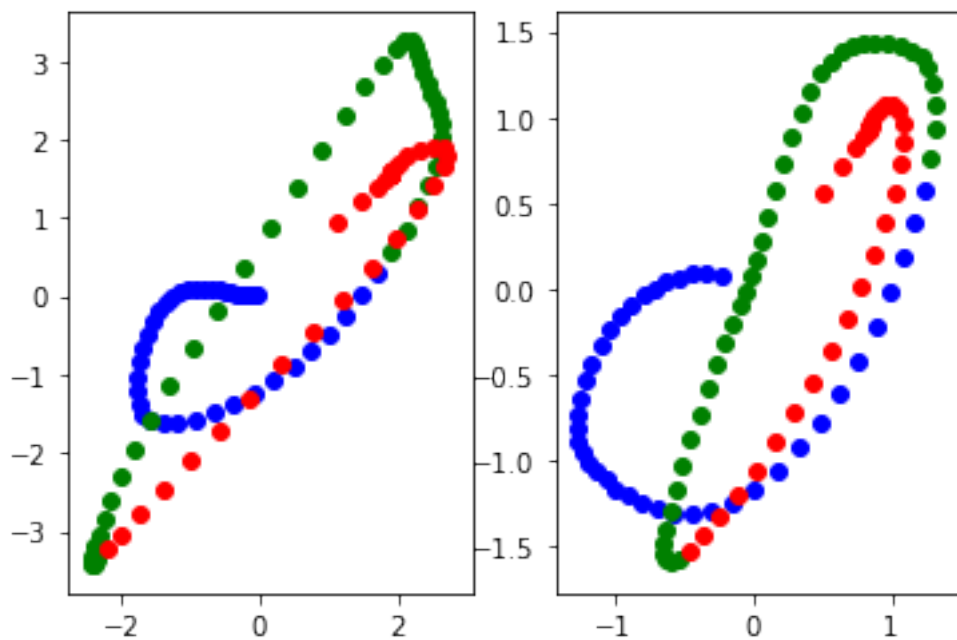
['c'] ['z'] -248.05338039929808



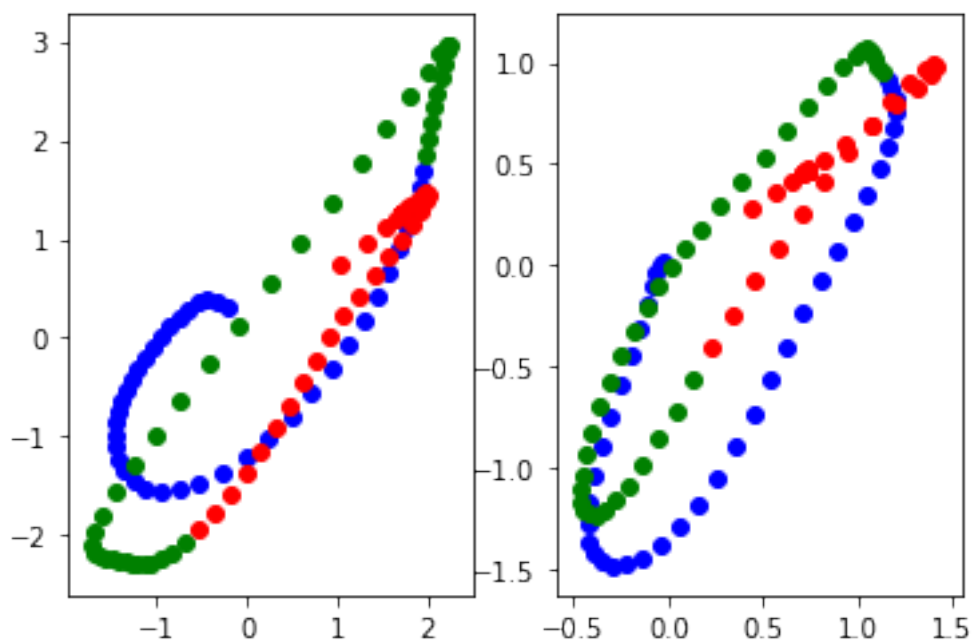
```
['c'] ['a'] -210.0936914395542 False
['c'] ['a'] -210.0936914395542
```



```
['c'] ['c'] -203.93402035904688 True
['d'] ['d'] -326.6928400414922 True
['d'] ['d'] -294.137906551189 True
['d'] ['d'] -265.18477357235696 True
['d'] ['a'] -335.54508953459157 False
['d'] ['a'] -335.54508953459157
```

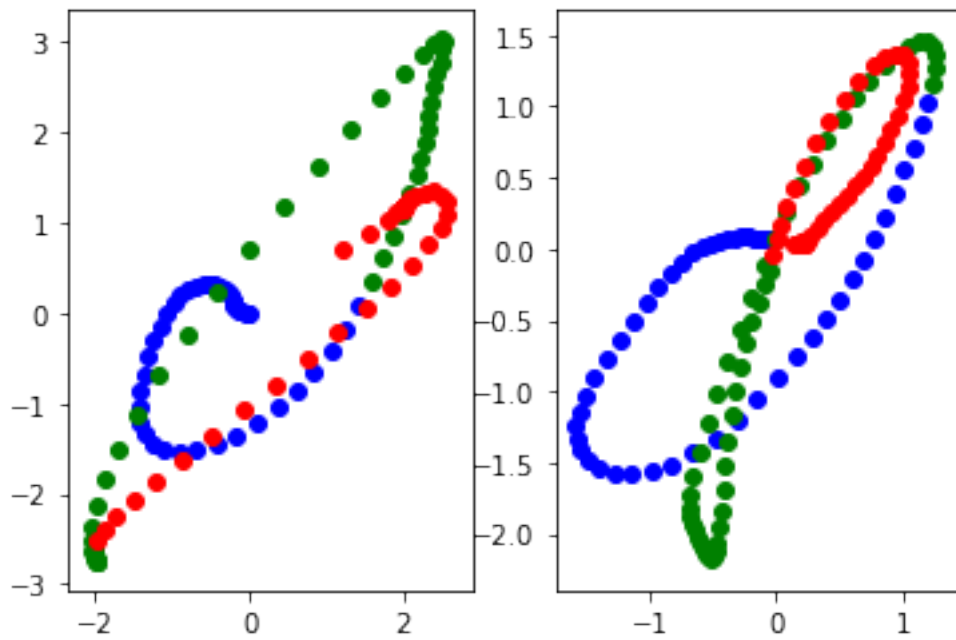


```
['d'] ['d'] -327.11390964516494 True
['d'] ['u'] -322.4147531735552 False
['d'] ['u'] -322.4147531735552
```

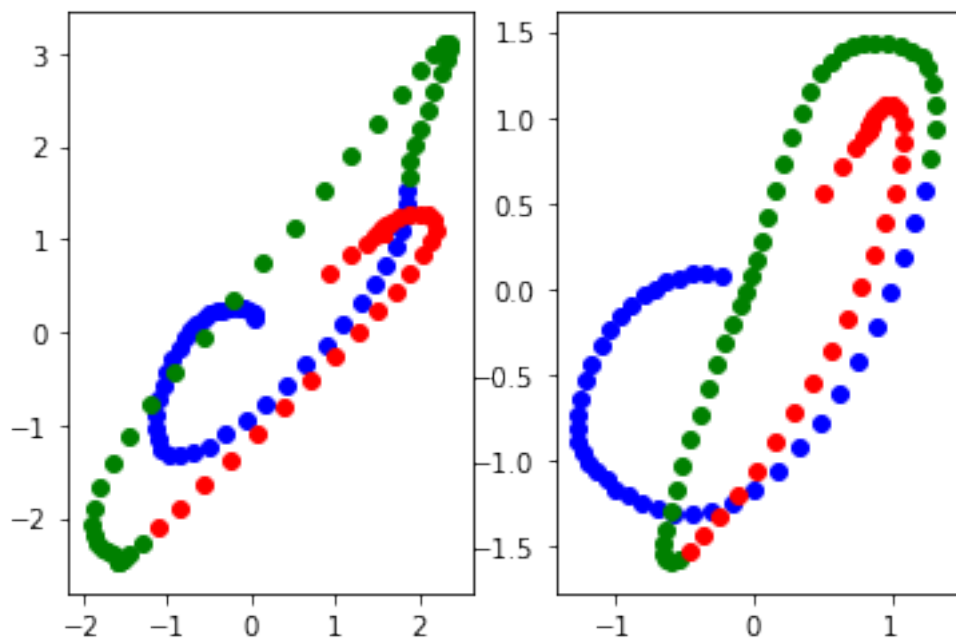


```
['d'] ['d'] -264.1477003076292 True
```

```
['d'] ['d'] -297.74220187183937 True
['d'] ['q'] -367.1972001953631 False
['d'] ['q'] -367.1972001953631
```



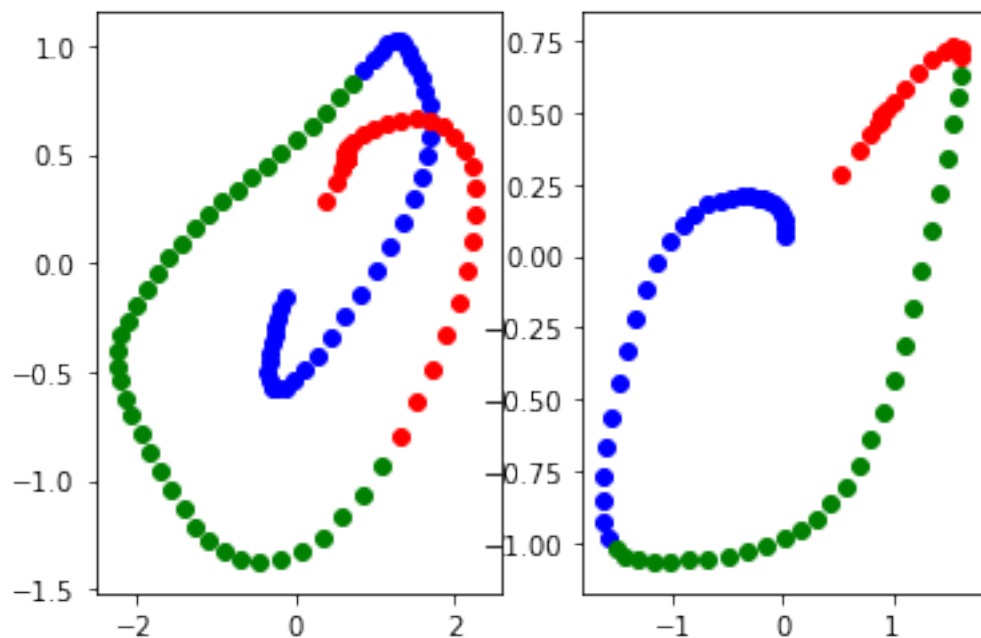
```
['d'] ['d'] -285.7503012561471 True
['d'] ['d'] -329.7846691554509 True
['d'] ['a'] -323.60851555612703 False
['d'] ['a'] -323.60851555612703
```



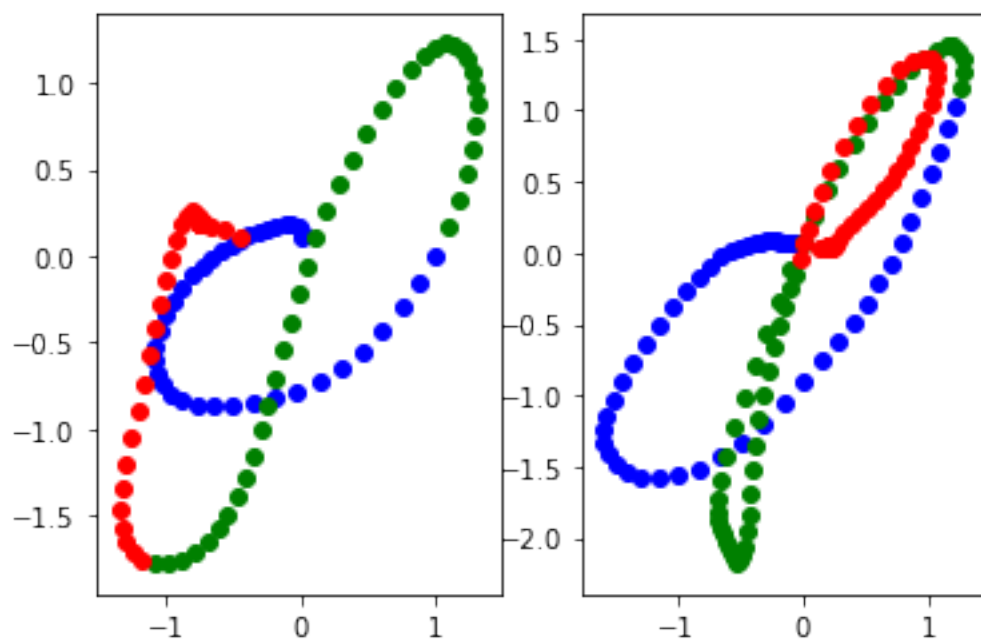
```

['d'] ['d'] -329.29985087230716 True
['d'] ['d'] -280.47434859189127 True
['e'] ['e'] -285.8846908199264 True
['e'] ['e'] -284.4246513372349 True
['e'] ['e'] -311.3664430887198 True
['e'] ['e'] -304.0900657026425 True
['e'] ['e'] -290.9649799895752 True
['e'] ['e'] -304.72795321074483 True
['e'] ['e'] -286.5494630084147 True
['e'] ['e'] -270.90421287246846 True
['e'] ['e'] -305.2157817786663 True
['e'] ['e'] -261.50057728450577 True
['e'] ['e'] -310.32591911001634 True
['e'] ['e'] -269.22483102792165 True
['e'] ['e'] -302.99573153490275 True
['e'] ['e'] -370.53681462544665 True
['e'] ['e'] -314.9461064565661 True
['e'] ['e'] -356.1399693173842 True
['e'] ['e'] -326.1038460725444 True
['e'] ['e'] -325.5430934135531 True
['e'] ['c'] -324.6455075942164 False
['e'] ['c'] -324.6455075942164

```



```
['e'] ['e'] -267.13825666291154 True
['g'] ['g'] -392.08559271867375 True
['g'] ['g'] -400.1131535473265 True
['g'] ['q'] -359.63530020074614 False
['g'] ['q'] -359.63530020074614
```

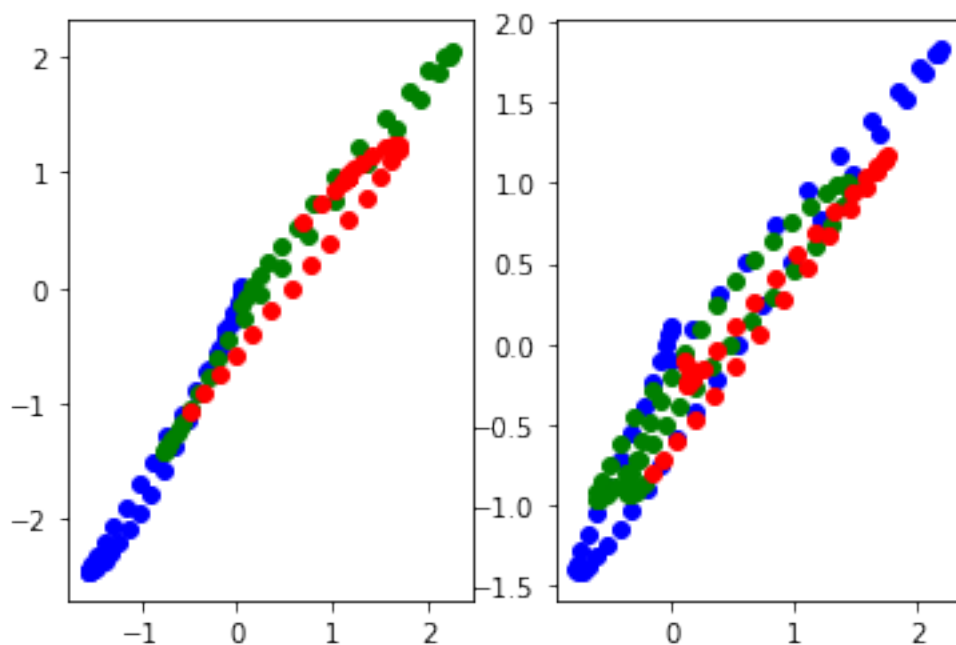




```

['g'] ['g'] -389.63894146248 True
['g'] ['g'] -379.0657394921734 True
['g'] ['g'] -365.53326671981455 True
['g'] ['g'] -356.12596946559347 True
['g'] ['g'] -342.1546653724865 True
['g'] ['g'] -358.0640539198067 True
['g'] ['g'] -409.5199007294092 True
['g'] ['g'] -419.7825128964303 True
['h'] ['m'] -253.4134232897515 False
['h'] ['m'] -253.4134232897515

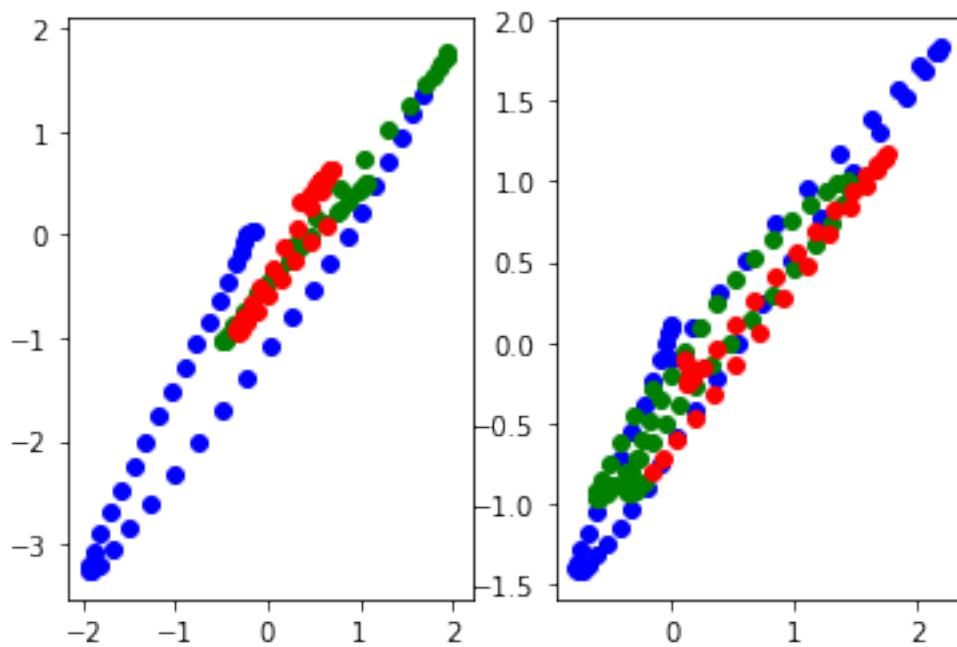
```



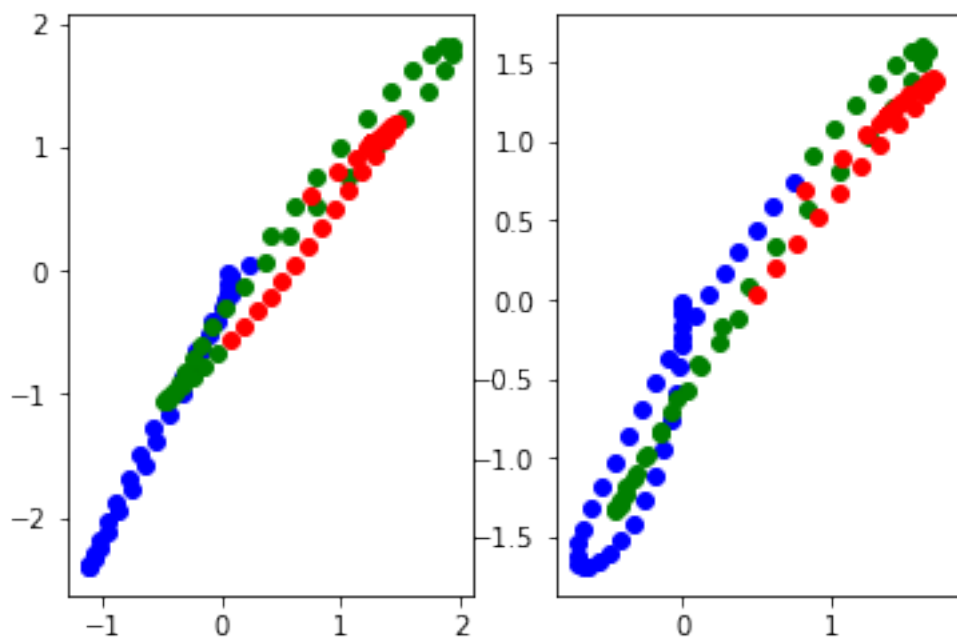
```

['h'] ['h'] -258.04572803883985 True
['h'] ['h'] -229.11161828411267 True
['h'] ['h'] -305.95829069478157 True
['h'] ['m'] -240.4013792164933 False
['h'] ['m'] -240.4013792164933

```

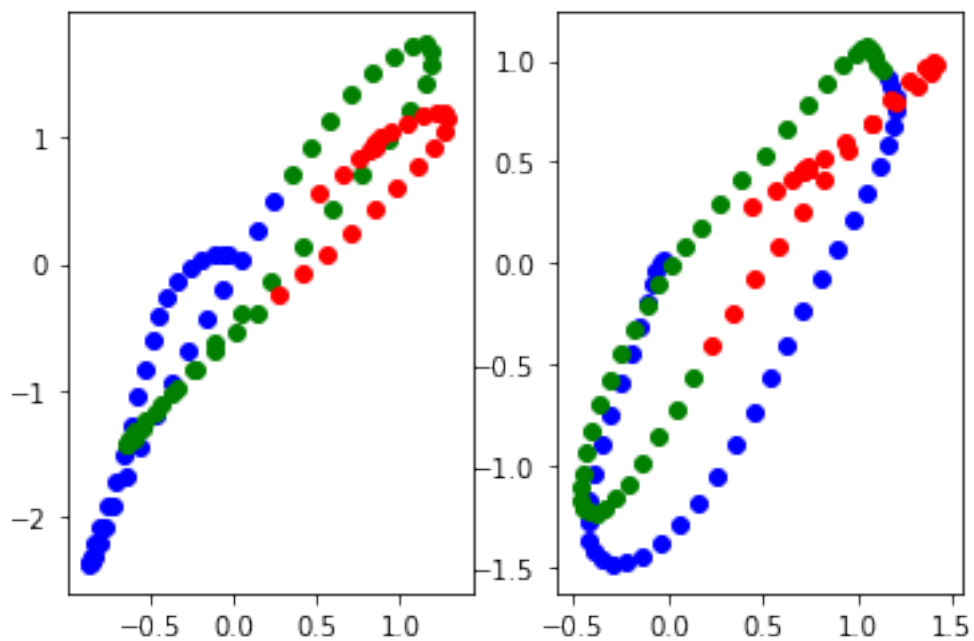


```
['h'] ['h'] -222.19695207101734 True
['h'] ['n'] -224.78579275438625 False
['h'] ['n'] -224.78579275438625
```

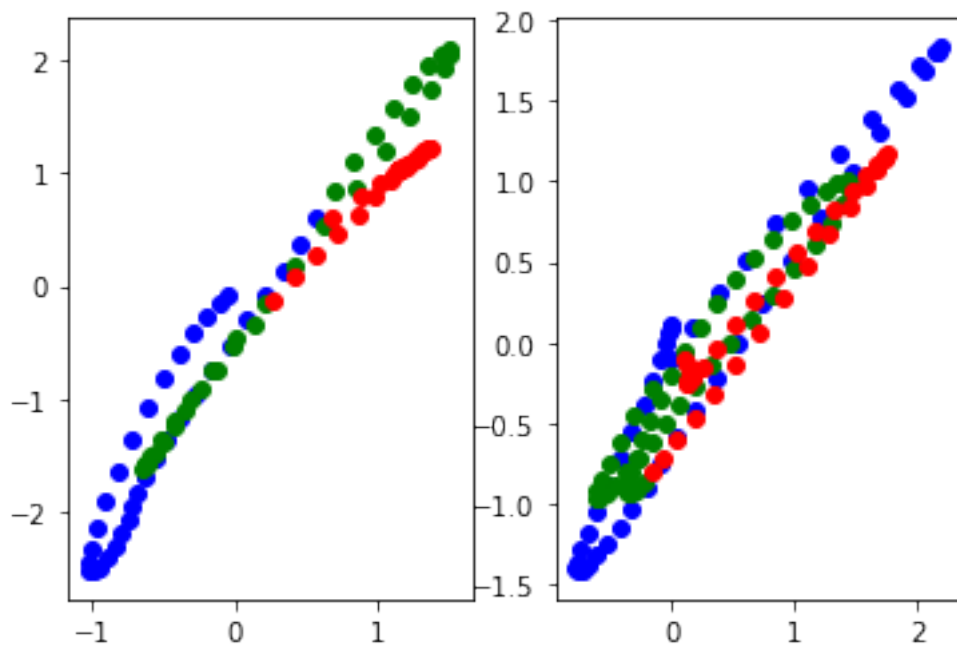


```
['h'] ['u'] -261.559311035692 False
```

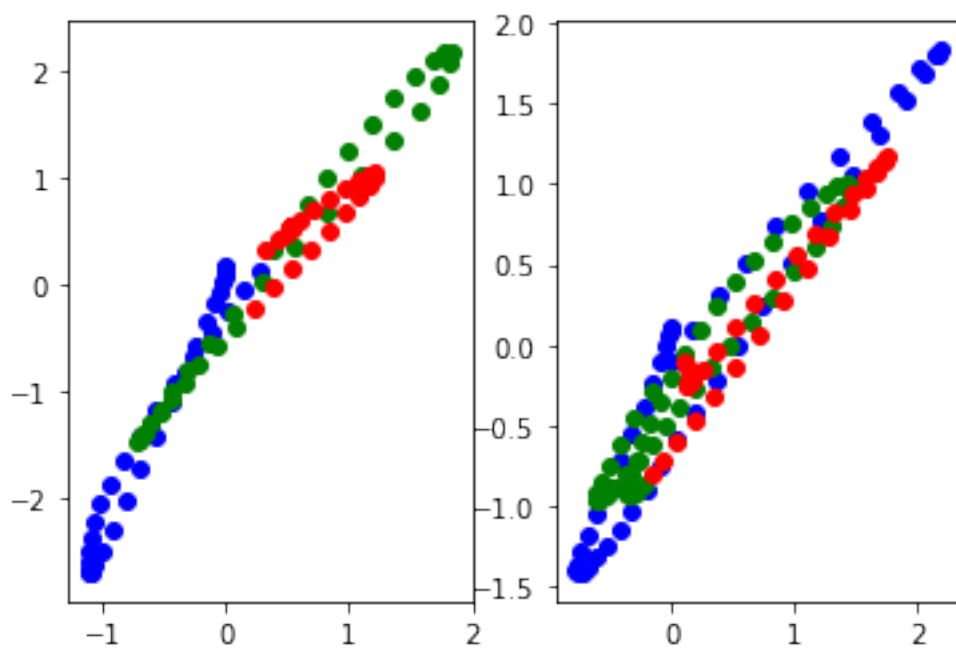
['h'] ['u'] -261.559311035692



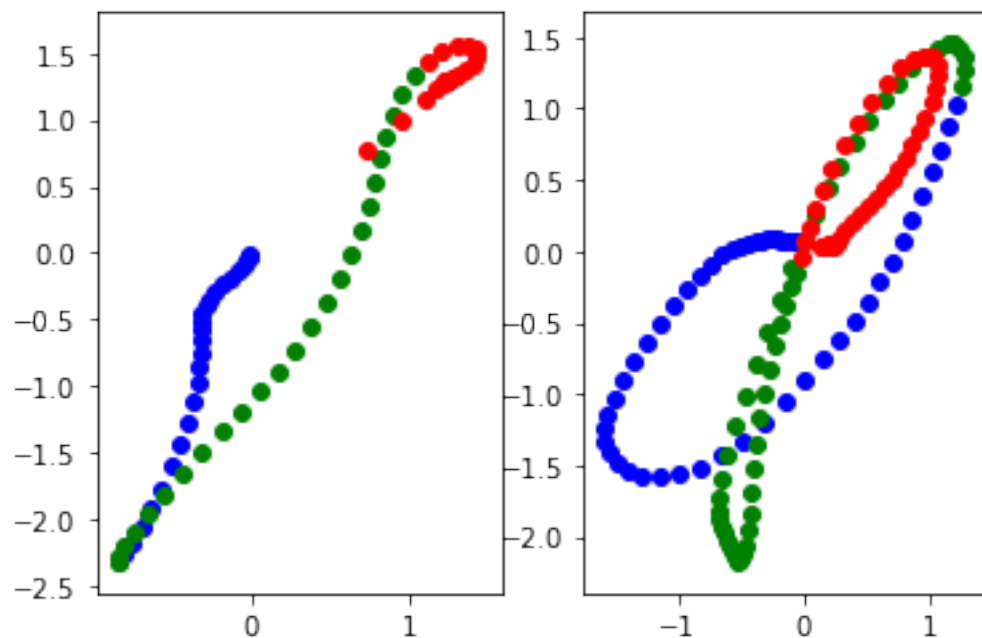
['h'] ['h'] -256.6779127407097 True  
['h'] ['m'] -207.66798114985932 False  
['h'] ['m'] -207.66798114985932



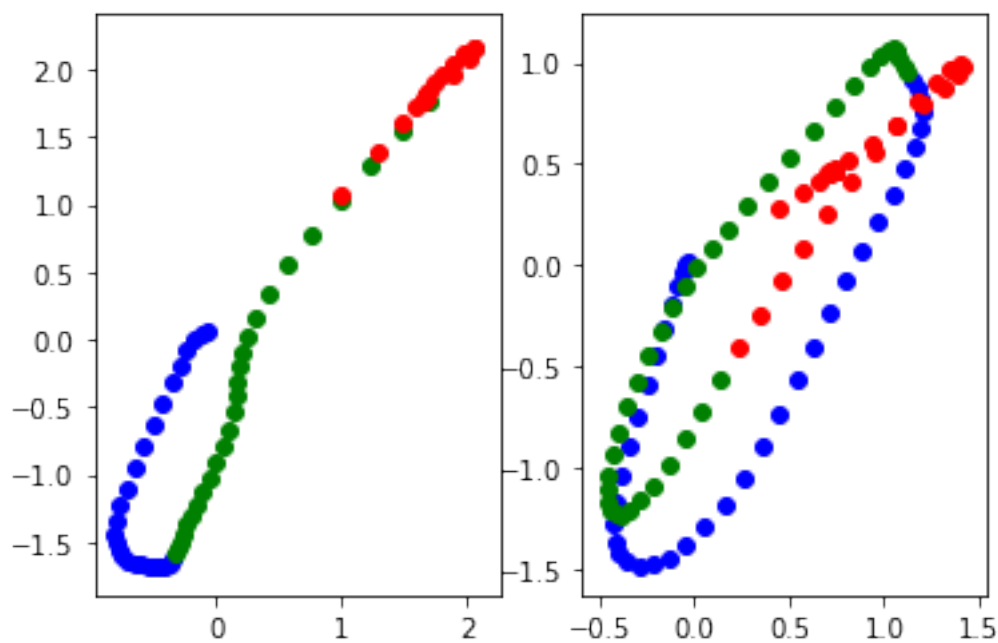
```
['h'] ['m'] -220.4876119756092 False
['h'] ['m'] -220.4876119756092
```



```
['h'] ['h'] -218.42573305670808 True
['l'] ['q'] -211.54101271814045 False
['l'] ['q'] -211.54101271814045
```



```
['l'] ['u'] -196.5925828910494 False
['l'] ['u'] -196.5925828910494
```

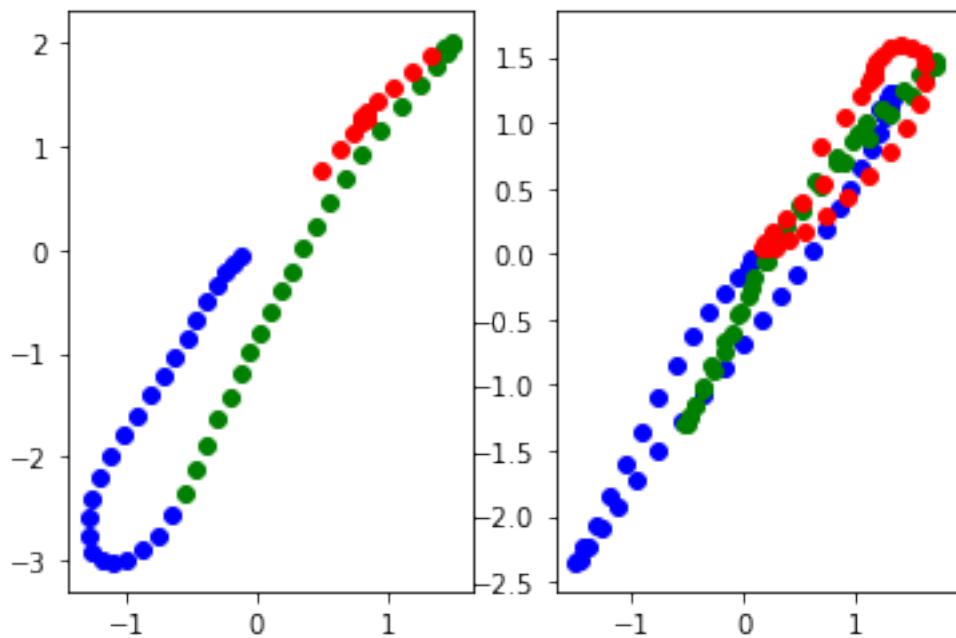


```
['l'] ['l'] -157.25281809799682 True
['l'] ['l'] -182.95944404277182 True
```

```

['l'] ['l'] -181.35519811049818 True
['l'] ['l'] -172.83345354672772 True
['l'] ['w'] -158.65303980596377 False
['l'] ['w'] -158.65303980596377

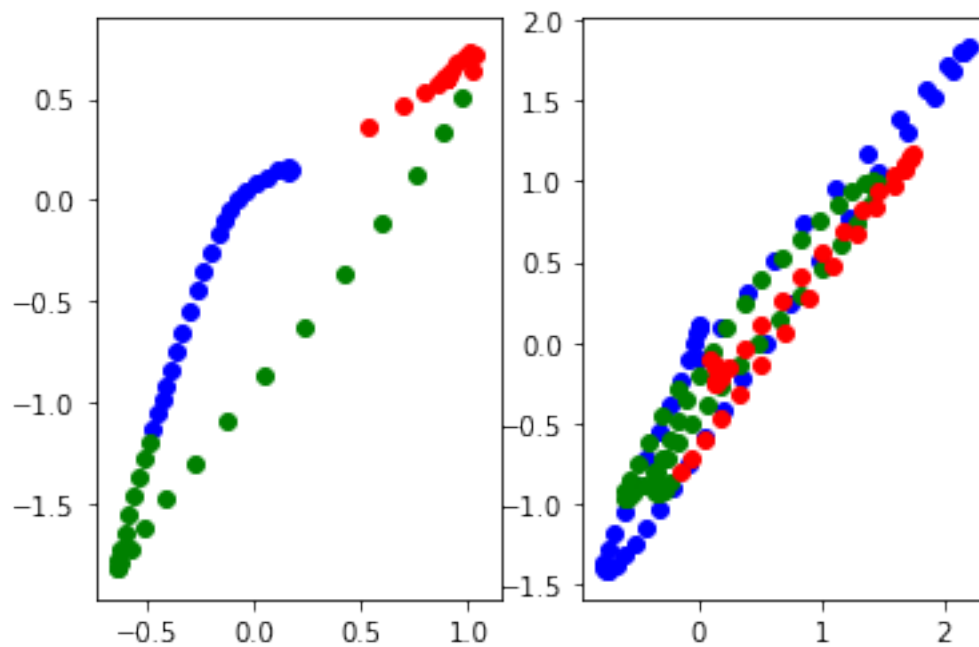
```



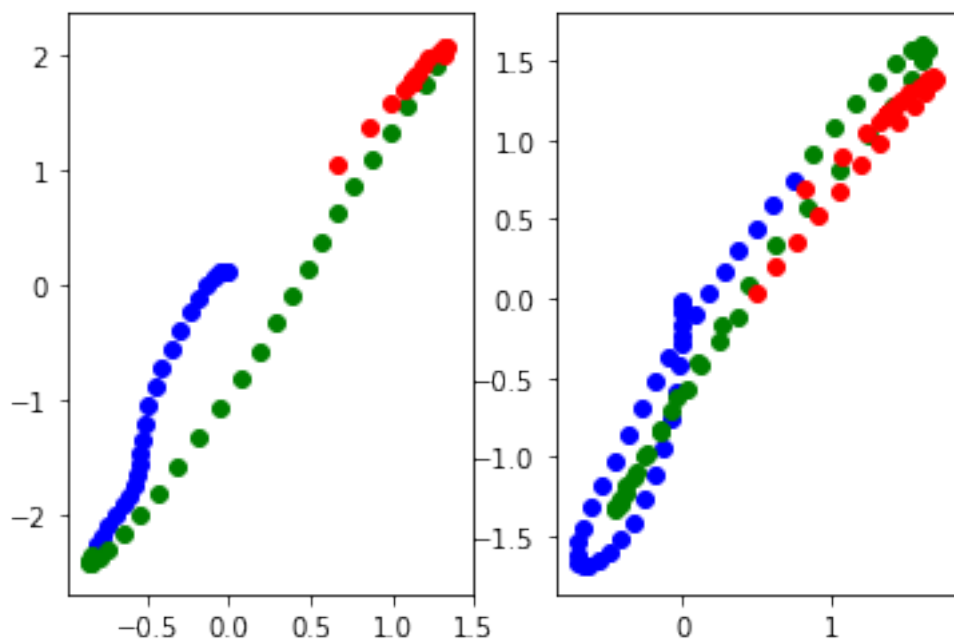
```

['l'] ['l'] -183.03879593847208 True
['l'] ['m'] -133.28082543054822 False
['l'] ['m'] -133.28082543054822

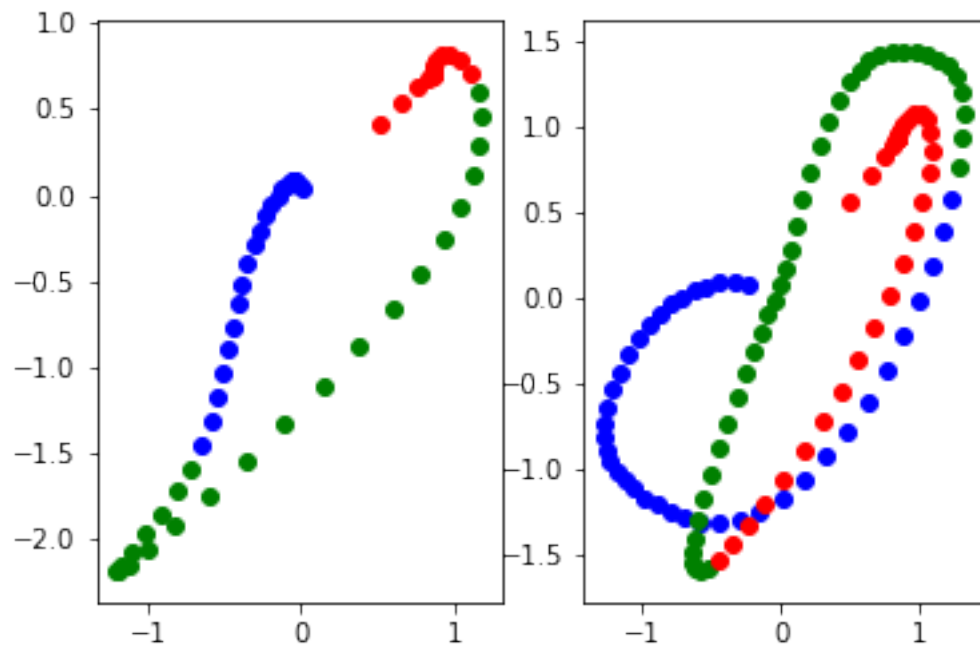
```



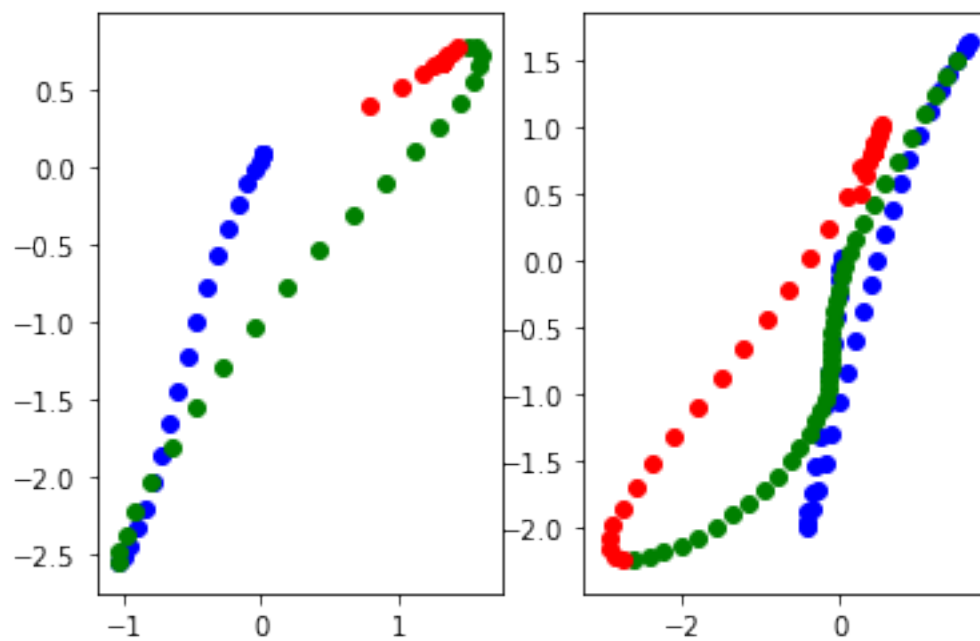
```
['1'] ['n'] -176.12359773911214 False
['1'] ['n'] -176.12359773911214
```



```
['1'] ['a'] -186.45057636722976 False
['1'] ['a'] -186.45057636722976
```



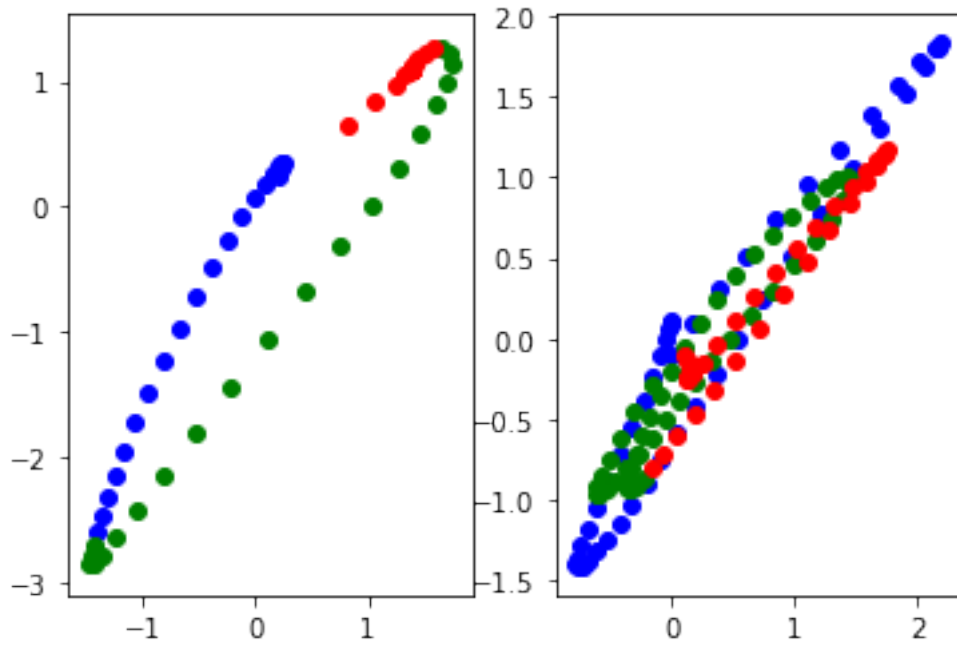
```
['l'] ['l'] -194.21237914124399 True
['l'] ['y'] -158.07479915110682 False
['l'] ['y'] -158.07479915110682
```



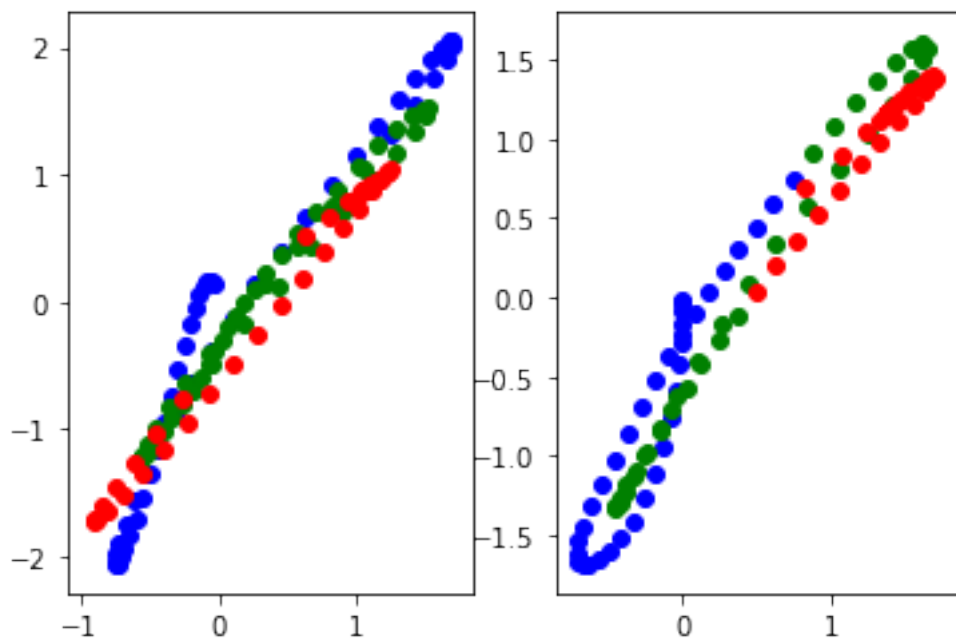
```
['l'] ['m'] -130.30329688987592 False
```



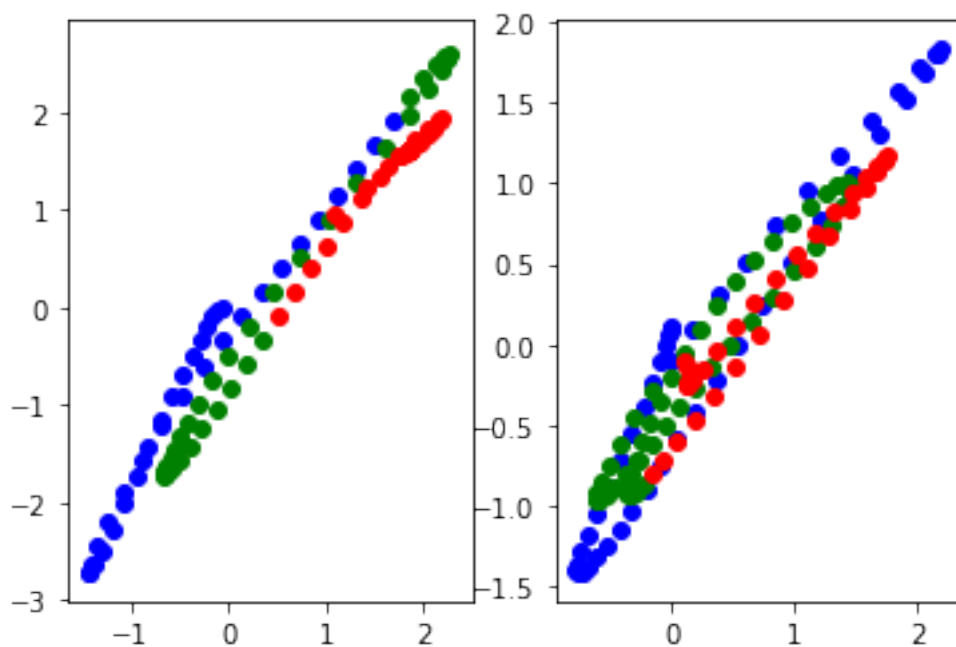
```
['l'] ['m'] -130.30329688987592
```



```
['l'] ['l'] -175.53644262714857 True
['m'] ['m'] -318.56662204437094 True
['m'] ['m'] -349.2159458483283 True
['m'] ['m'] -262.41951789715773 True
['m'] ['n'] -284.4792867723202 False
['m'] ['n'] -284.4792867723202
```



```
['m'] ['m'] -289.32342341743913 True
['n'] ['m'] -206.23502231243904 False
['n'] ['m'] -206.23502231243904
```

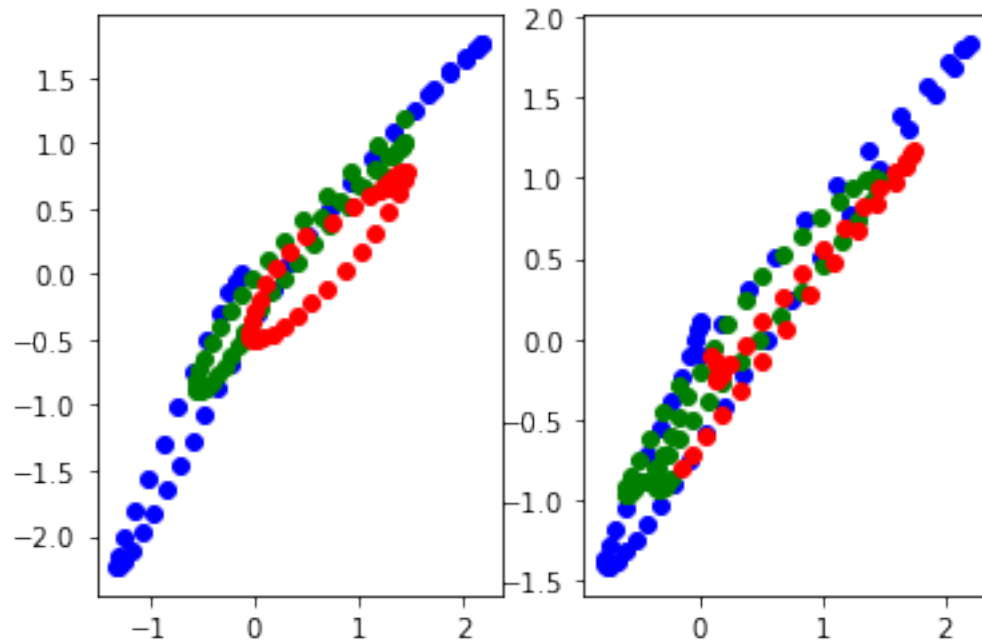


```
['n'] ['n'] -222.87120647472707 True
```

```

['n'] ['n'] -216.9164426239116 True
['n'] ['n'] -255.03277490820435 True
['n'] ['n'] -211.11845317390657 True
['n'] ['m'] -318.2515448300057 False
['n'] ['m'] -318.2515448300057

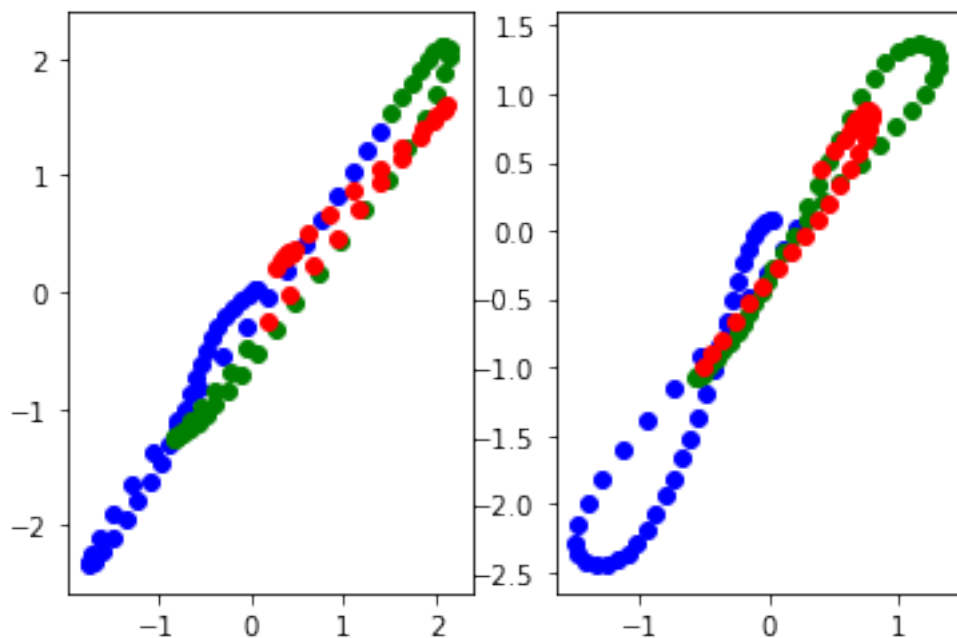
```



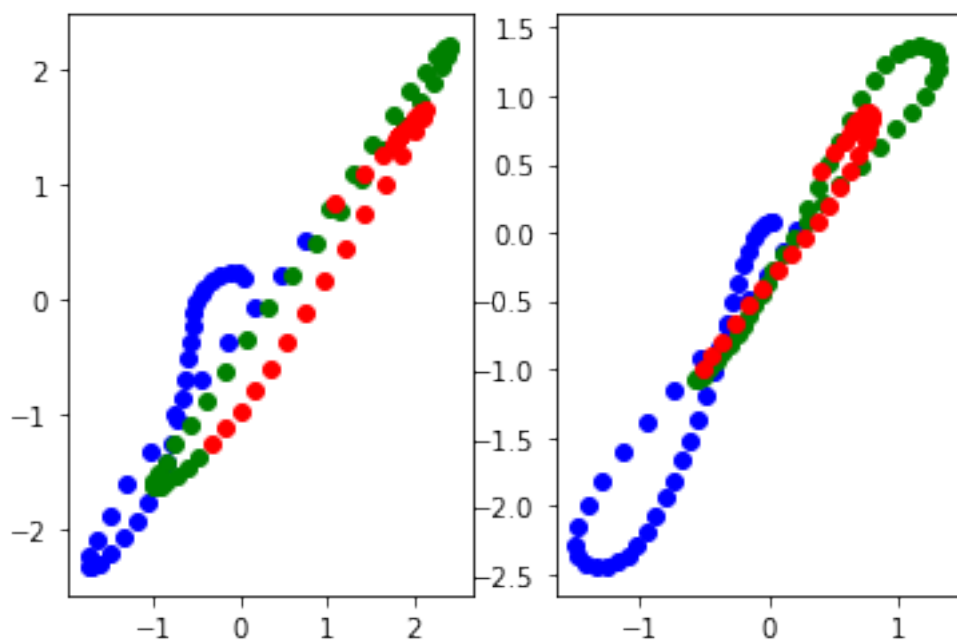
```

['n'] ['n'] -265.60480351928175 True
['n'] ['h'] -253.246057688851 False
['n'] ['h'] -253.246057688851

```

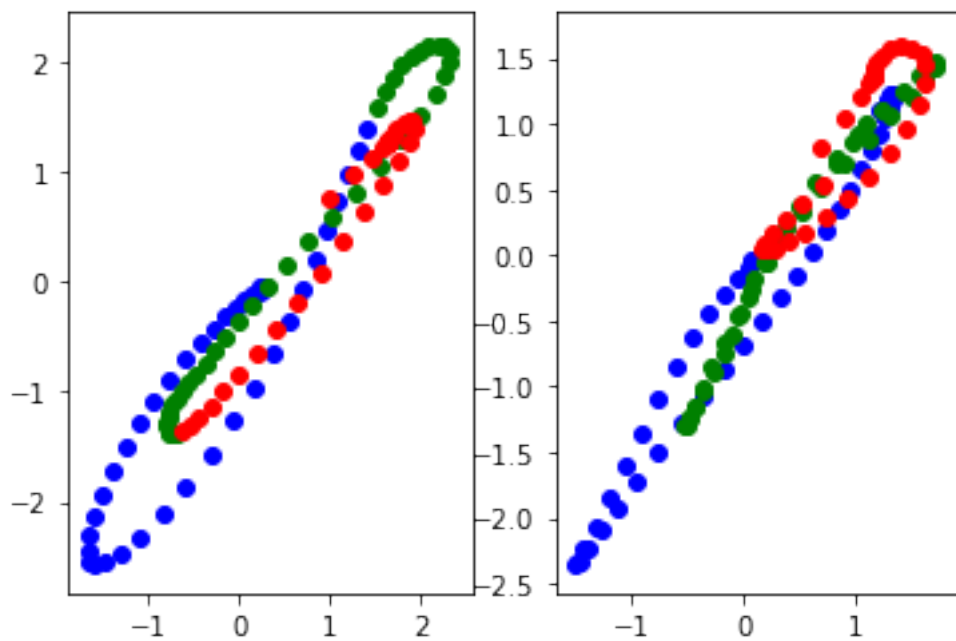


```
['n'] ['n'] -299.9616407927536 True
['n'] ['h'] -238.80575210034797 False
['n'] ['h'] -238.80575210034797
```



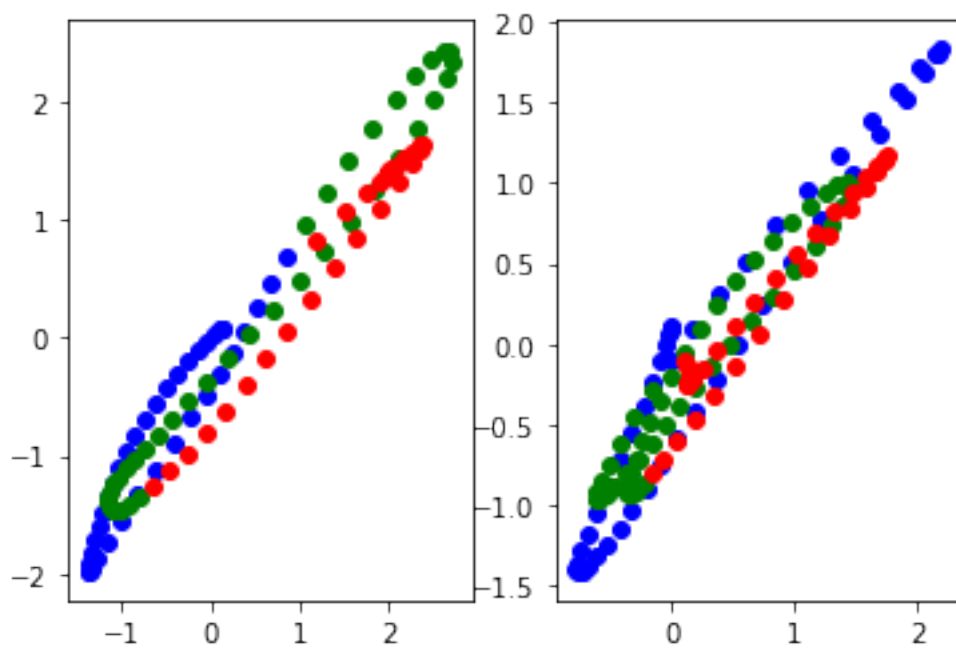
```
['n'] ['w'] -287.6818439924156 False
```

['n'] ['w'] -287.6818439924156



['n'] ['m'] -253.8766919016143 False

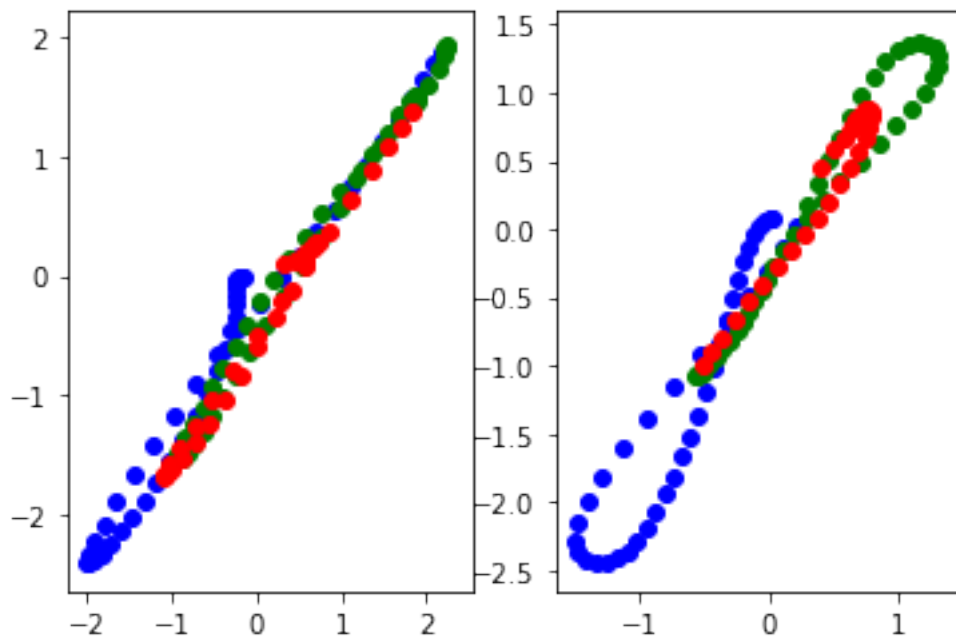
['n'] ['m'] -253.8766919016143



```

['n'] ['n'] -301.7422984635943 True
['n'] ['n'] -248.83417804198794 True
['n'] ['h'] -327.3999596378898 False
['n'] ['h'] -327.3999596378898

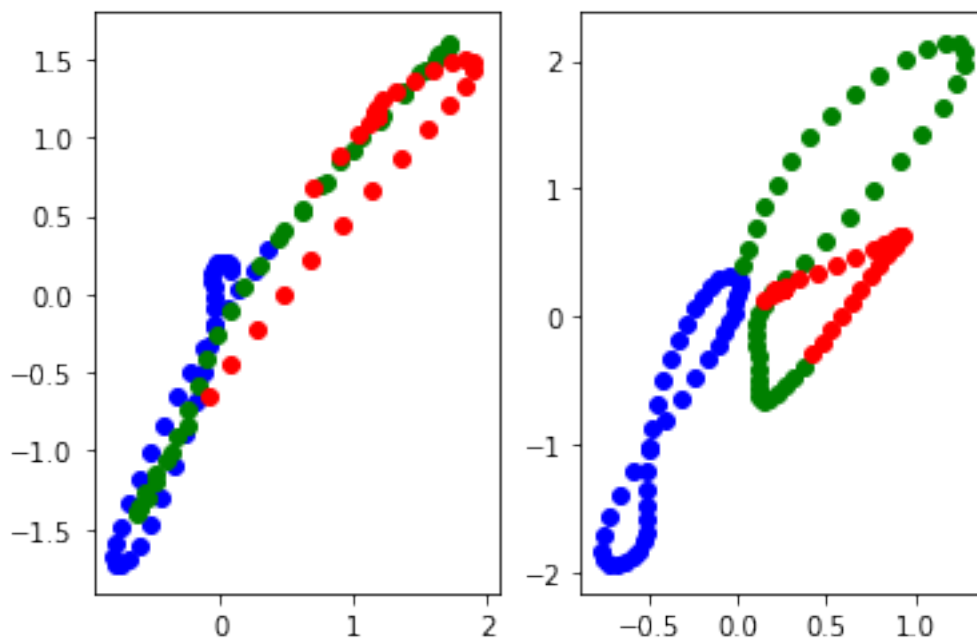
```



```

['n'] ['r'] -308.2577777819559 False
['n'] ['r'] -308.2577777819559

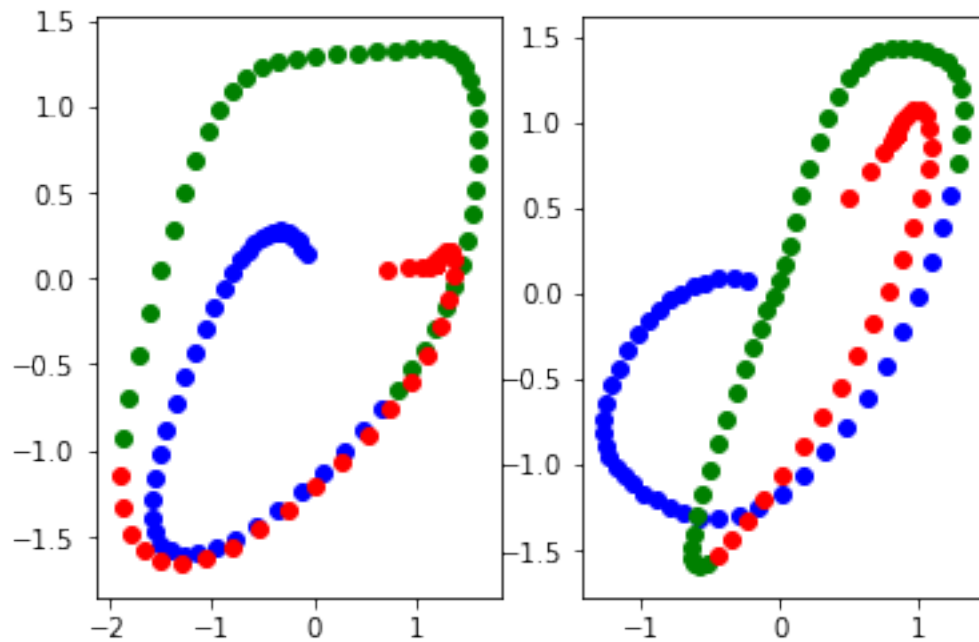
```



```

['o'] ['o'] -320.66842370775856 True
['o'] ['o'] -335.2611638385688 True
['o'] ['a'] -325.6672255750644 False
['o'] ['a'] -325.6672255750644

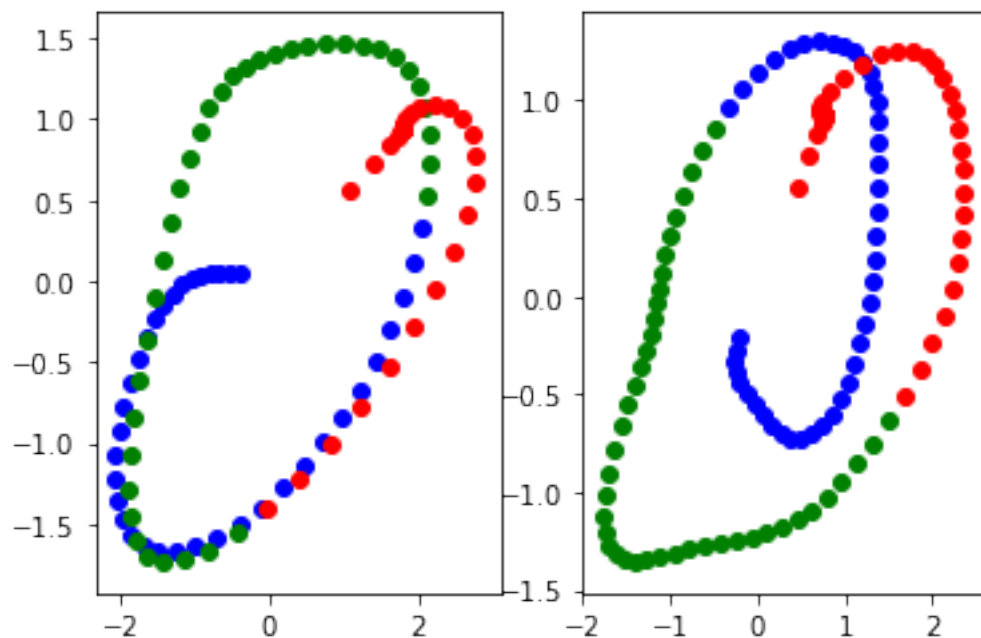
```



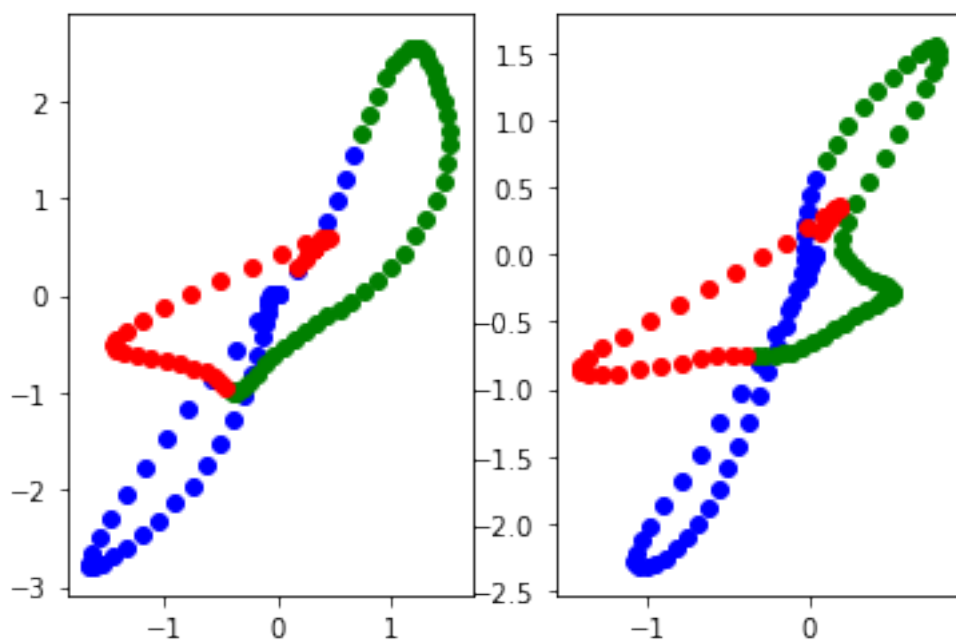
```

['o'] ['o'] -257.4860446981601 True
['o'] ['o'] -310.04884838168033 True
['o'] ['o'] -279.10967624828754 True
['o'] ['o'] -272.3034791305367 True
['o'] ['o'] -303.1487790541845 True
['o'] ['o'] -325.33260670993 True
['o'] ['o'] -341.5466179701159 True
['o'] ['o'] -273.19603284966183 True
['o'] ['o'] -349.63006054178123 True
['o'] ['e'] -299.77343136648636 False
['o'] ['e'] -299.77343136648636

```



```
['p'] ['p'] -346.0008120153714 True
['p'] ['p'] -353.87248322837814 True
['p'] ['b'] -364.6799115187759 False
['p'] ['b'] -364.6799115187759
```

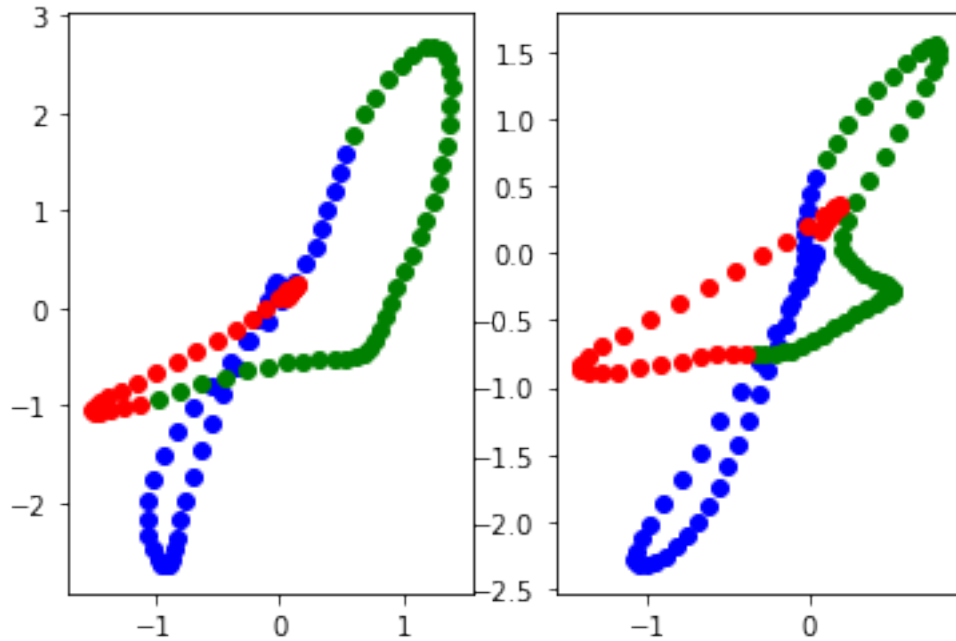




```

['p'] ['p'] -407.7560944600435 True
['p'] ['p'] -372.21000392574103 True
['p'] ['b'] -325.33649653824403 False
['p'] ['b'] -325.33649653824403

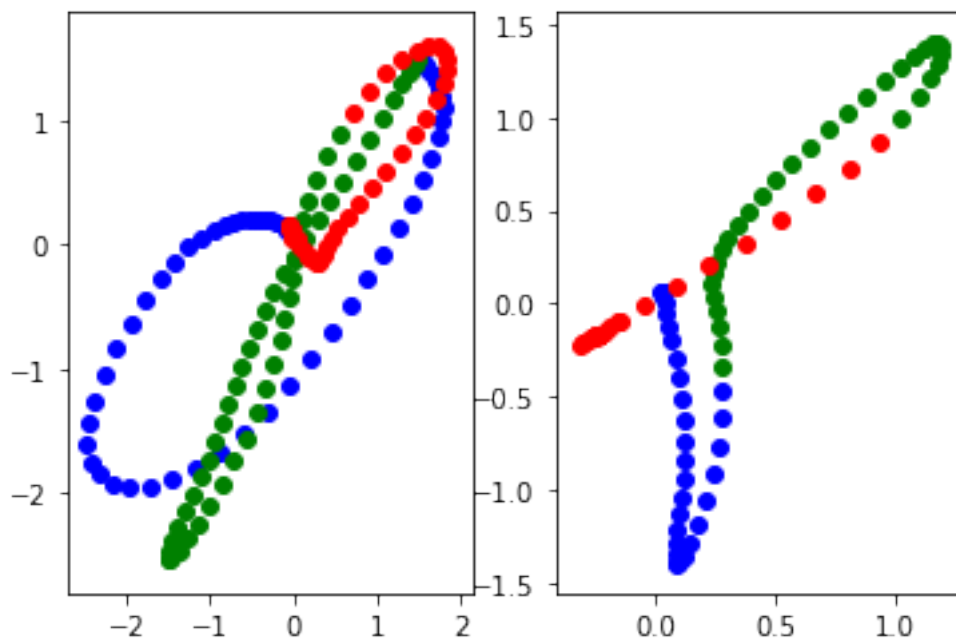
```



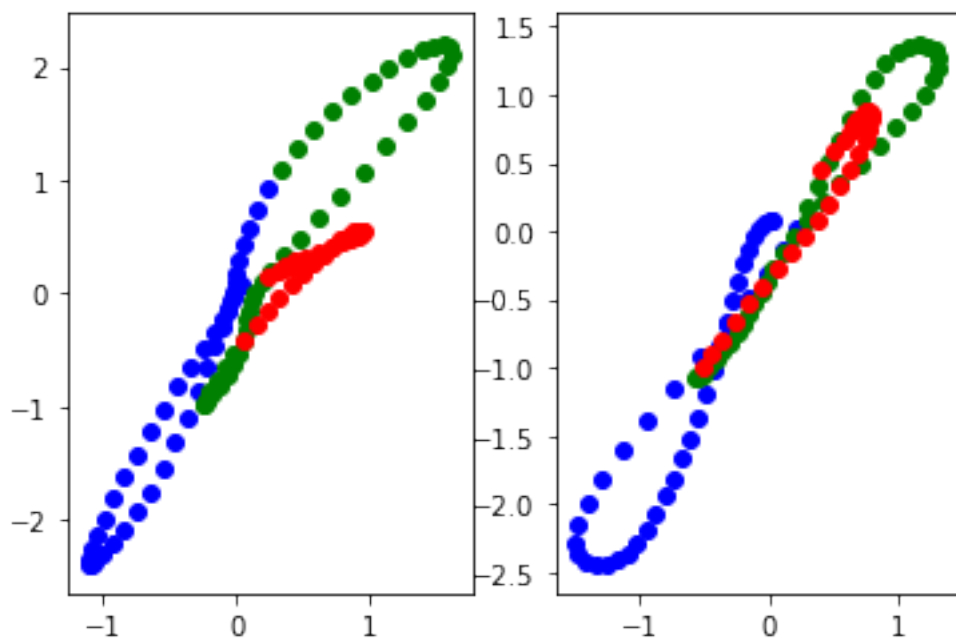
```

['p'] ['p'] -333.2939830991483 True
['p'] ['p'] -363.96200684225005 True
['p'] ['p'] -357.1345251598072 True
['p'] ['p'] -386.13675719134335 True
['p'] ['p'] -400.9679689078924 True
['p'] ['p'] -350.47387356923525 True
['p'] ['p'] -348.9508990219256 True
['p'] ['p'] -362.66392895362395 True
['q'] ['q'] -469.98008286527386 True
['q'] ['q'] -474.59545012848497 True
['q'] ['v'] -502.62284983277107 False
['q'] ['v'] -502.62284983277107

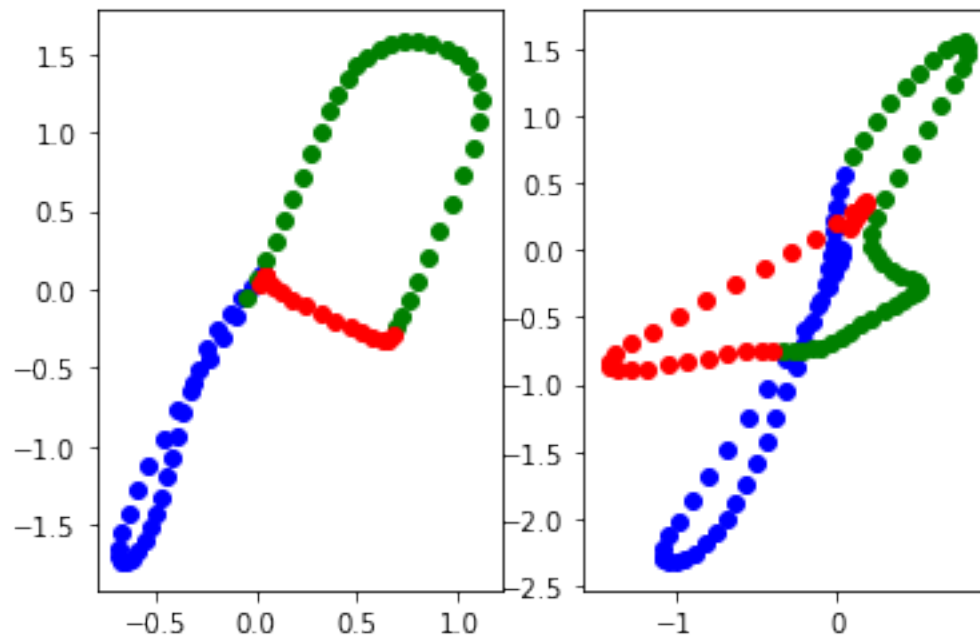
```



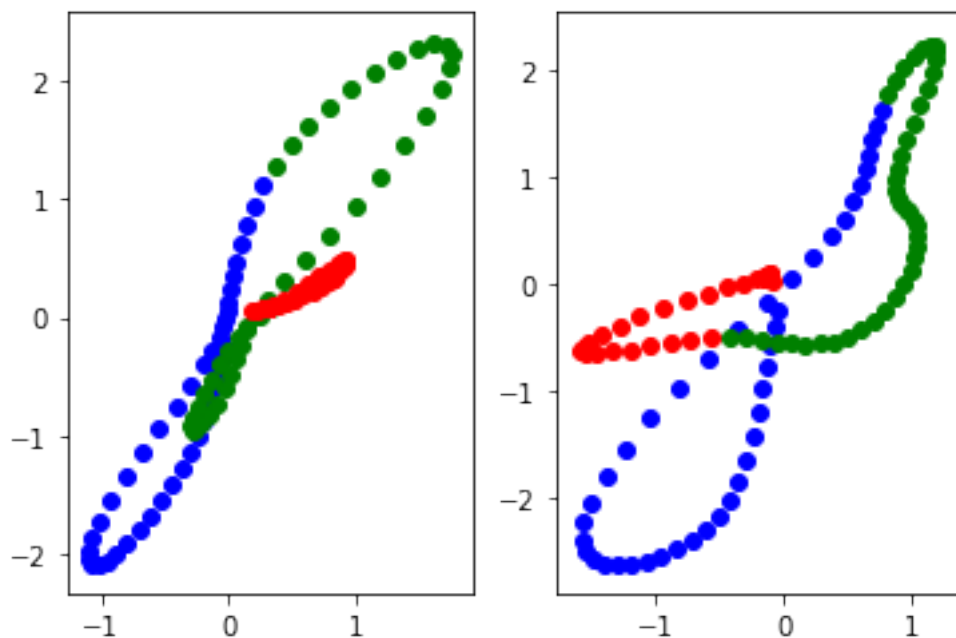
```
['q'] ['q'] -469.70123570909266 True
['q'] ['q'] -415.01815732265266 True
['q'] ['q'] -460.27439438412995 True
['q'] ['q'] -426.0664771491163 True
['r'] ['r'] -290.17382938844617 True
['r'] ['h'] -315.16045433979025 False
['r'] ['h'] -315.16045433979025
```



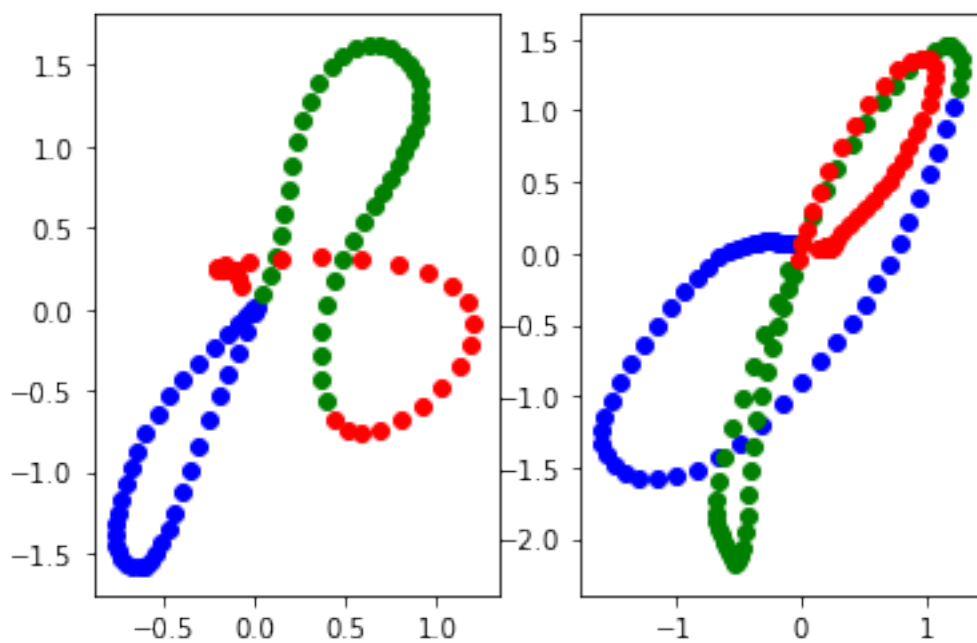
```
['r'] ['r'] -256.58526566266465 True
['r'] ['b'] -292.74780321023087 False
['r'] ['b'] -292.74780321023087
```



```
['r'] ['p'] -341.25367010501526 False
['r'] ['p'] -341.25367010501526
```

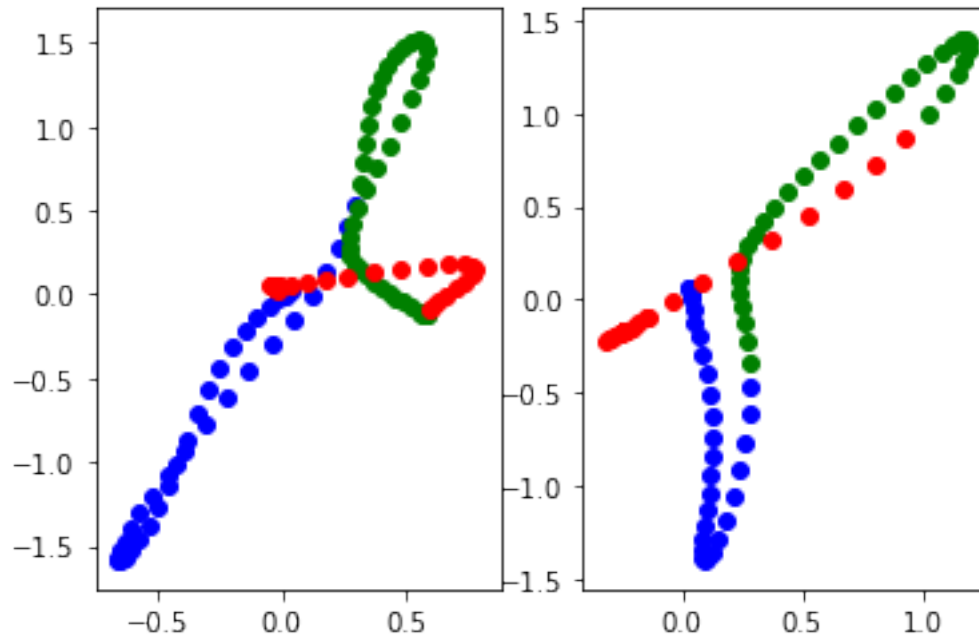


```
['r'] ['q'] -364.79879080941606 False
['r'] ['q'] -364.79879080941606
```

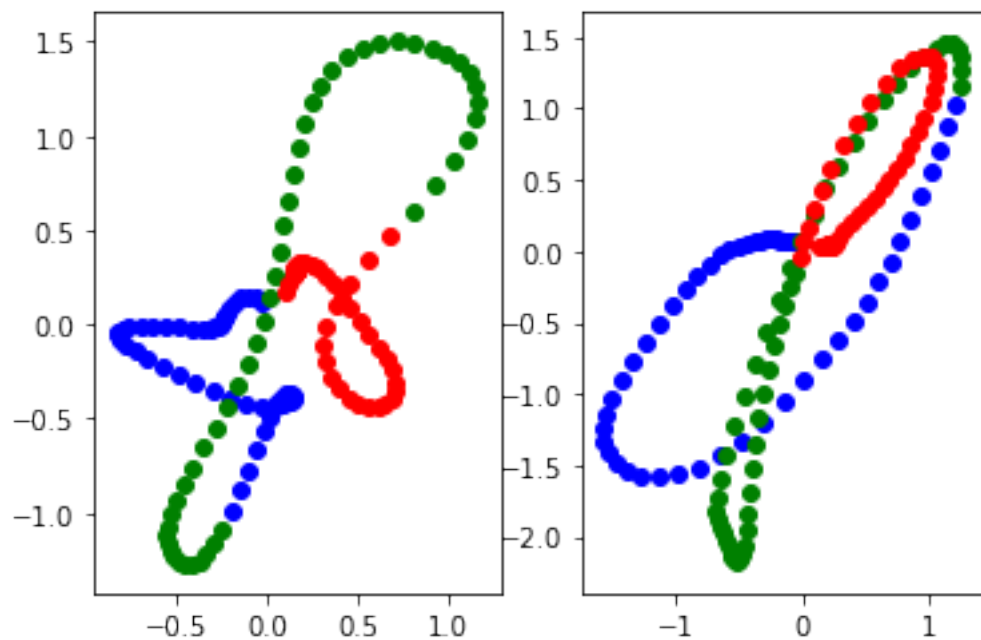


```
['r'] ['r'] -370.7781104688722 True
['r'] ['r'] -423.845183310746 True
```

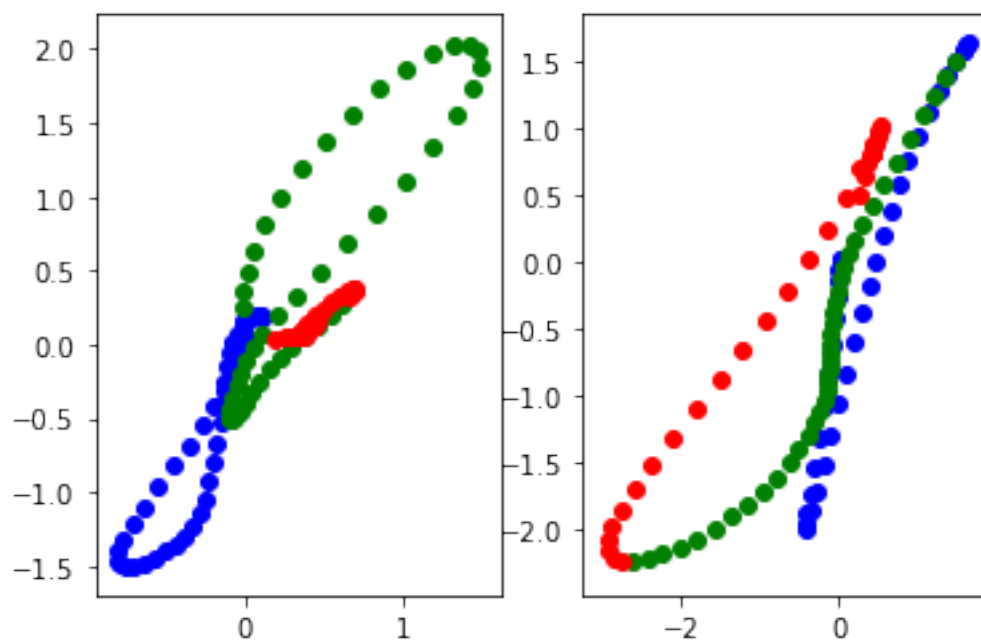
```
['r'] ['v'] -374.3322160200758 False
['r'] ['v'] -374.3322160200758
```



```
['r'] ['r'] -386.18994688573764 True
['r'] ['r'] -304.2714695798293 True
['r'] ['r'] -340.5309840621634 True
['r'] ['r'] -359.2774606374217 True
['r'] ['r'] -364.6894343214738 True
['r'] ['q'] -488.7348900245349 False
['r'] ['q'] -488.7348900245349
```



```
['r'] ['y'] -373.21843415932335 False
['r'] ['y'] -373.21843415932335
```

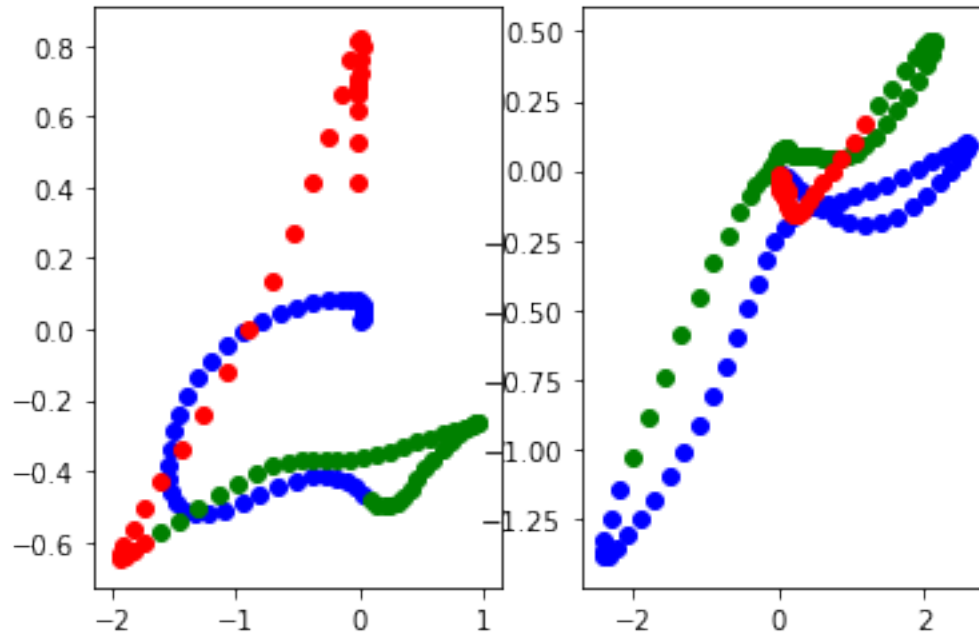


```
['s'] ['s'] -394.87102591605833 True
['s'] ['s'] -371.4091326461854 True
```

```

['s'] ['s'] -347.5926301736581 True
['s'] ['s'] -375.35372919489055 True
['s'] ['s'] -398.25133424844665 True
['s'] ['s'] -342.4233617931297 True
['s'] ['s'] -366.0266938781191 True
['s'] ['s'] -366.4312968708521 True
['s'] ['s'] -403.8793007733103 True
['s'] ['s'] -339.47275993152743 True
['s'] ['s'] -342.0942107770392 True
['s'] ['z'] -353.3583407410359 False
['s'] ['z'] -353.3583407410359

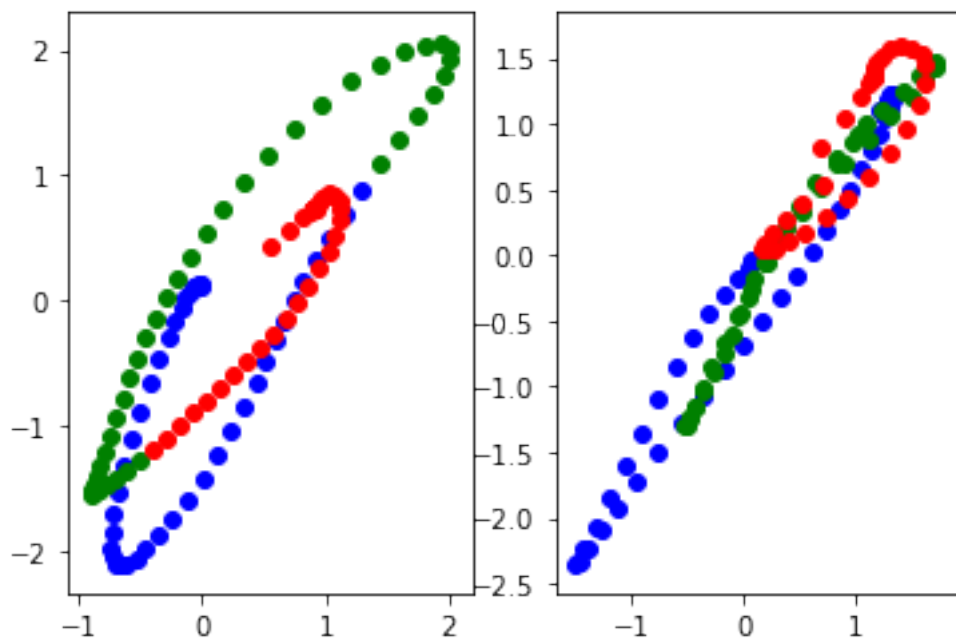
```



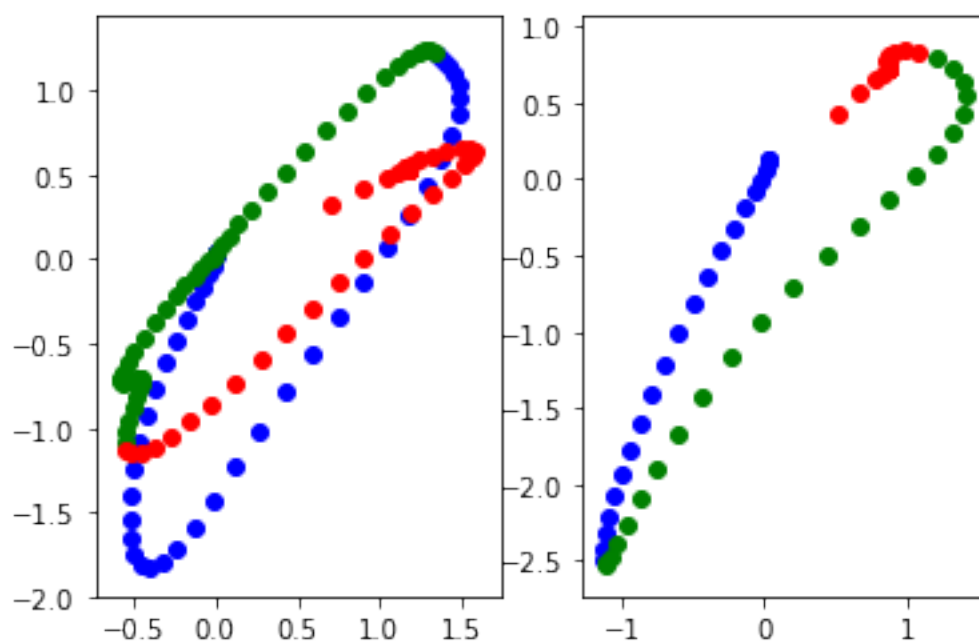
```

['s'] ['s'] -314.39217273142793 True
['s'] ['s'] -325.8114061278084 True
['u'] ['u'] -303.1620652902461 True
['u'] ['w'] -289.8136128959697 False
['u'] ['w'] -289.8136128959697

```



```
['u'] ['u'] -330.36405433026164 True
['u'] ['u'] -329.19522166475537 True
['u'] ['u'] -283.9407976623946 True
['u'] ['u'] -319.913835692215 True
['u'] ['l'] -345.6744702479209 False
['u'] ['l'] -345.6744702479209
```

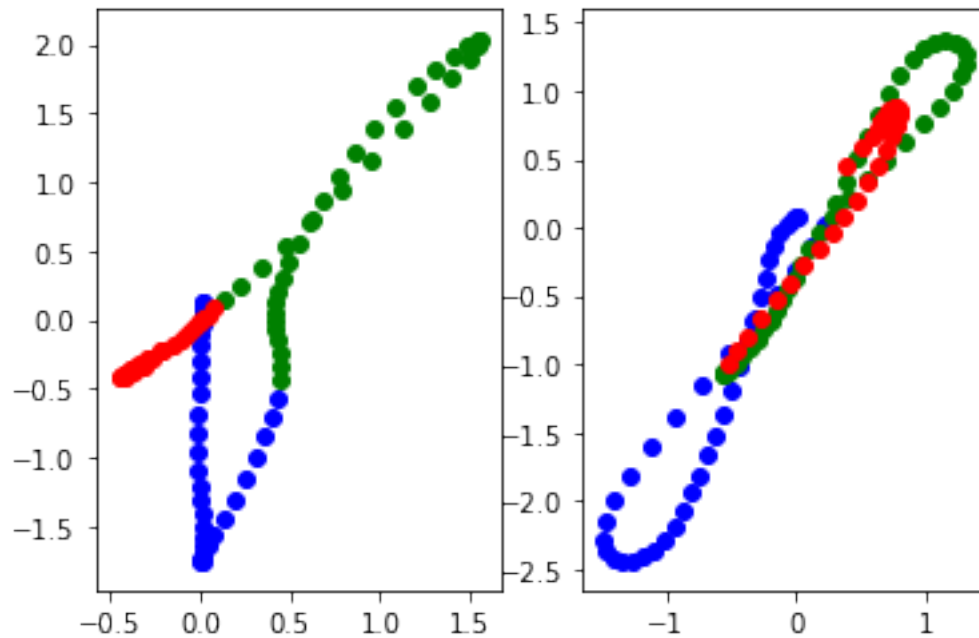




```

['u'] ['u'] -300.8720189412251 True
['v'] ['v'] -266.59621600766377 True
['v'] ['v'] -320.1766060616735 True
['v'] ['v'] -353.43773151798524 True
['v'] ['v'] -256.5365466610032 True
['v'] ['v'] -280.7308151345432 True
['v'] ['v'] -259.44369081959377 True
['v'] ['v'] -257.9139451381554 True
['v'] ['v'] -295.3767033983362 True
['v'] ['v'] -292.00992588863426 True
['v'] ['v'] -329.1290267964614 True
['v'] ['v'] -248.98644090511917 True
['v'] ['h'] -269.4434261938544 False
['v'] ['h'] -269.4434261938544

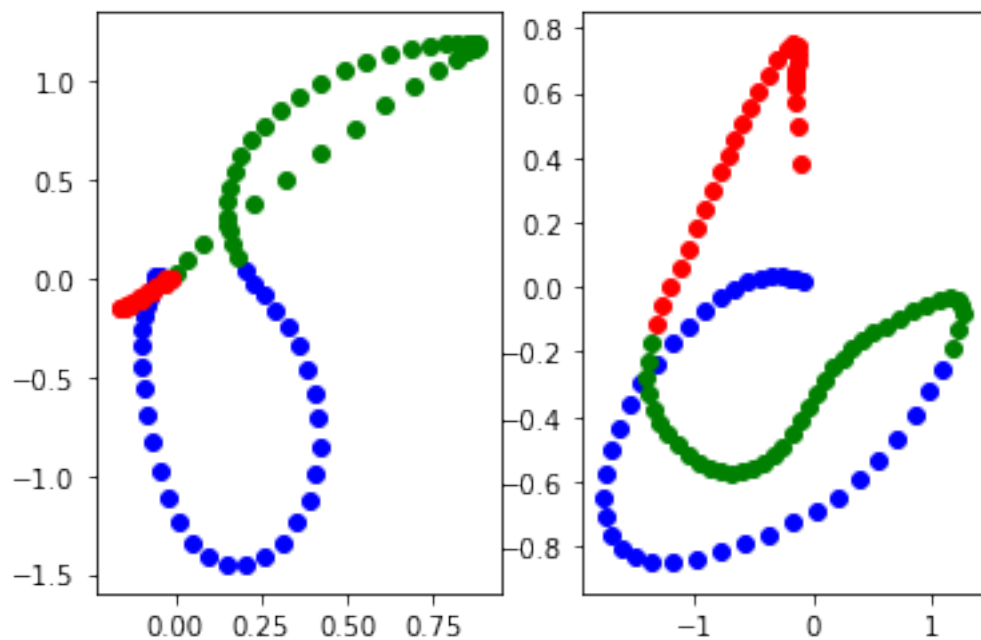
```



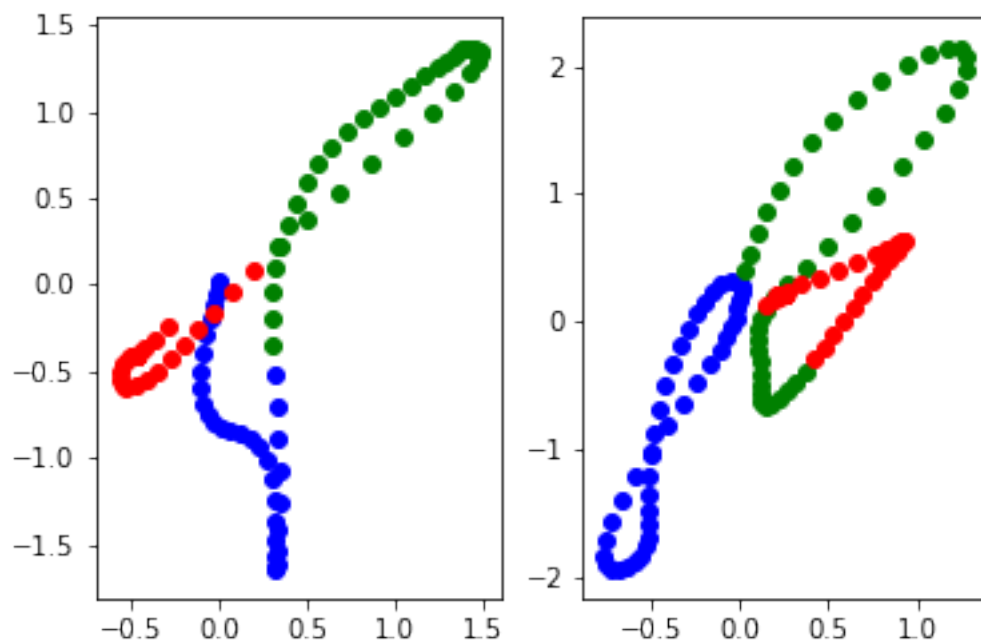
```

['v'] ['v'] -379.3528103001345 True
['v'] ['v'] -339.5404159333989 True
['v'] ['v'] -289.21593224899436 True
['v'] ['s'] -357.4622396625958 False
['v'] ['s'] -357.4622396625958

```

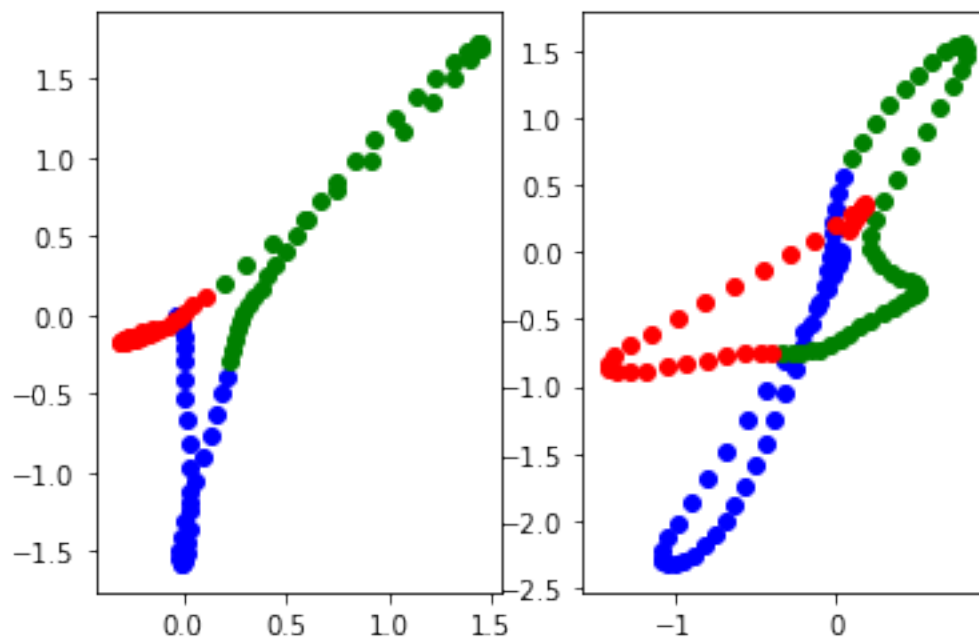


```
['v'] ['r'] -304.44961692648326 False
['v'] ['r'] -304.44961692648326
```

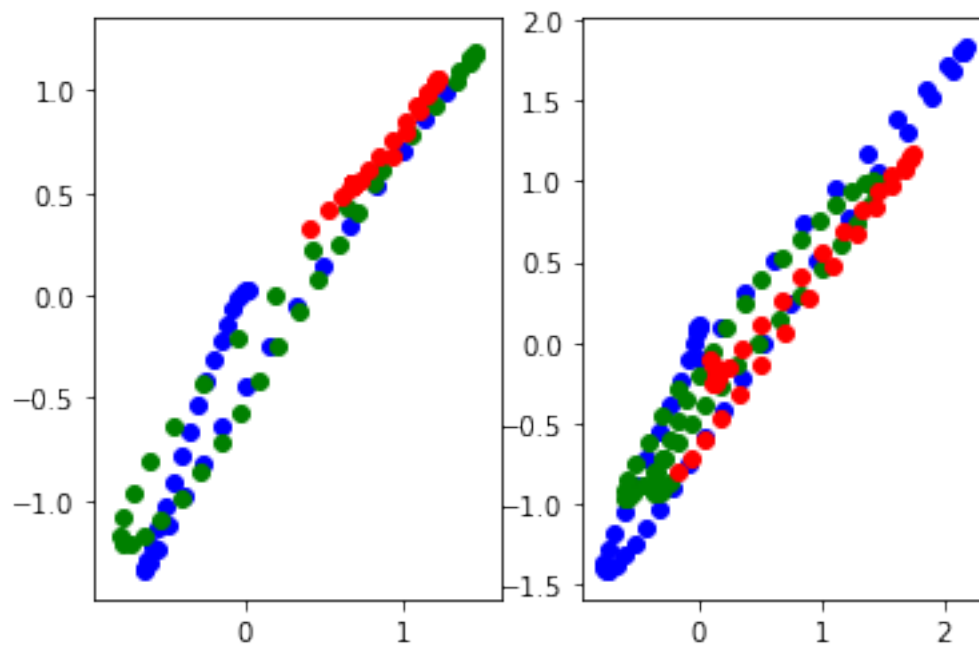


```
['v'] ['v'] -286.9719895923413 True
['v'] ['v'] -299.2968752400396 True
```

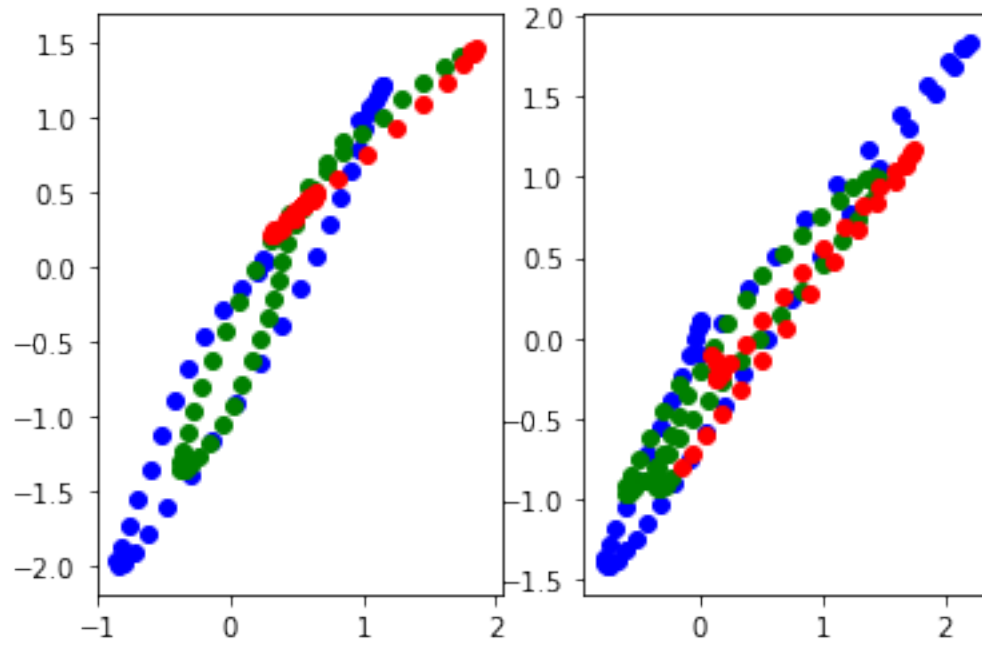
```
['v'] ['v'] -308.5208202178749 True
['v'] ['b'] -293.0919711450334 False
['v'] ['b'] -293.0919711450334
```



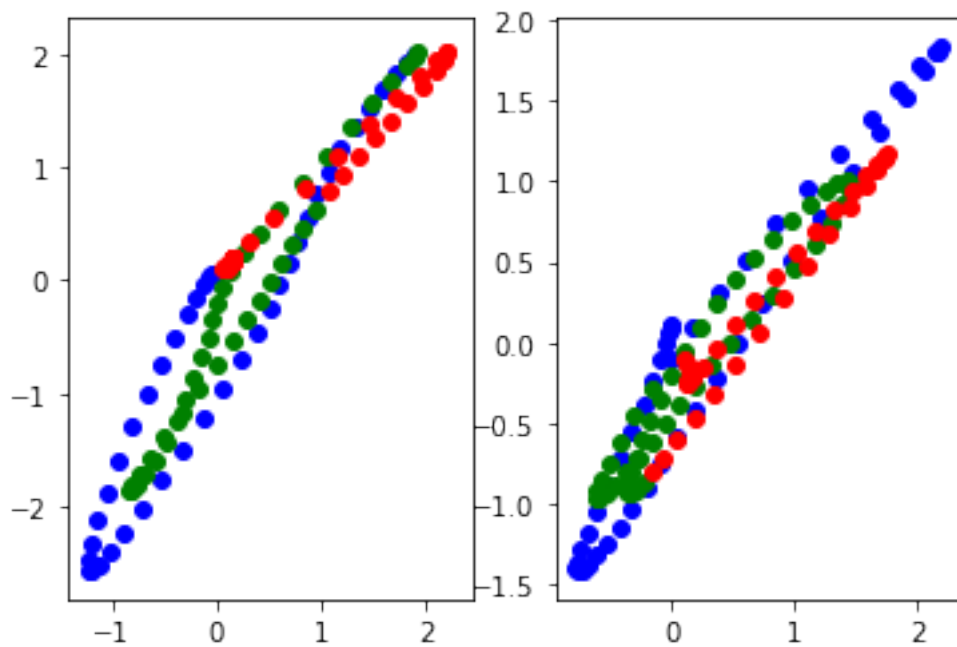
```
['v'] ['v'] -302.5970657539786 True
['w'] ['m'] -207.88411456113755 False
['w'] ['m'] -207.88411456113755
```



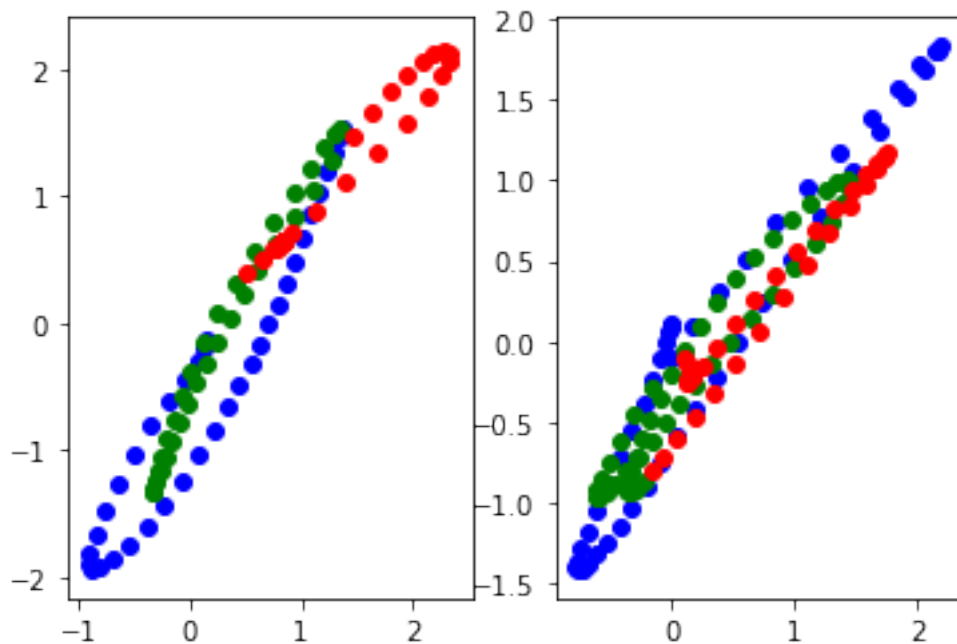
```
['w'] ['m'] -262.33296755267946 False  
['w'] ['m'] -262.33296755267946
```



```
['w'] ['m'] -261.6907841162294 False  
['w'] ['m'] -261.6907841162294
```

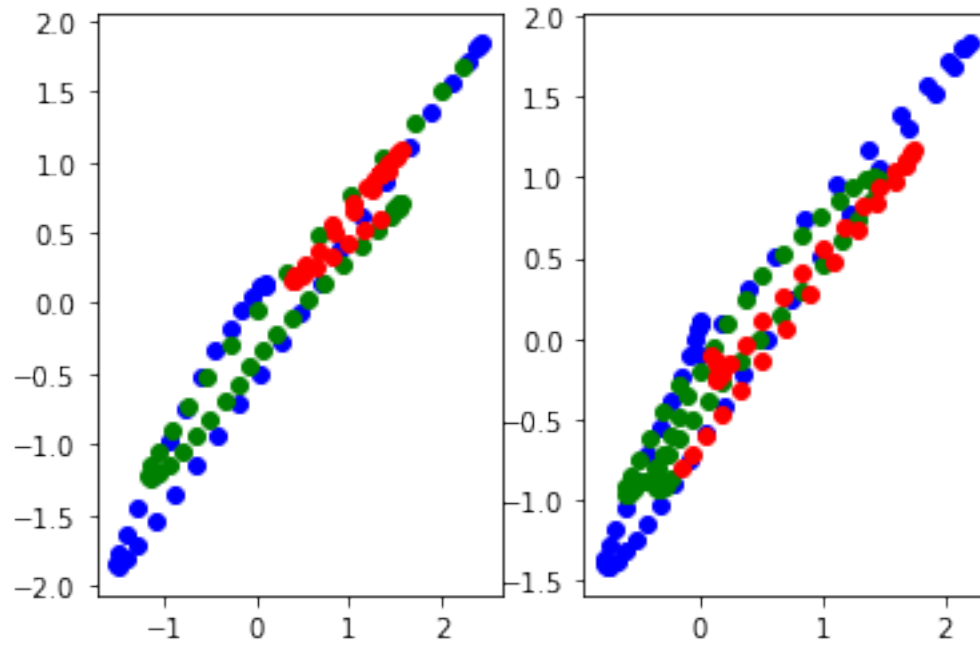


```
['w'] ['m'] -232.56599229676138 False
['w'] ['m'] -232.56599229676138
```

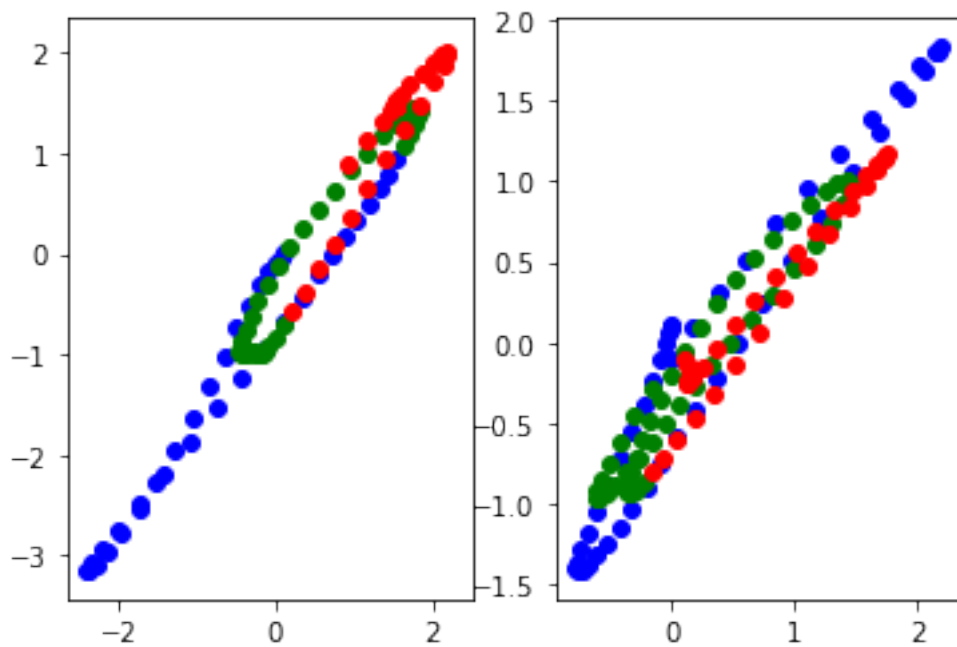


```
['w'] ['m'] -241.4946017743027 False
```

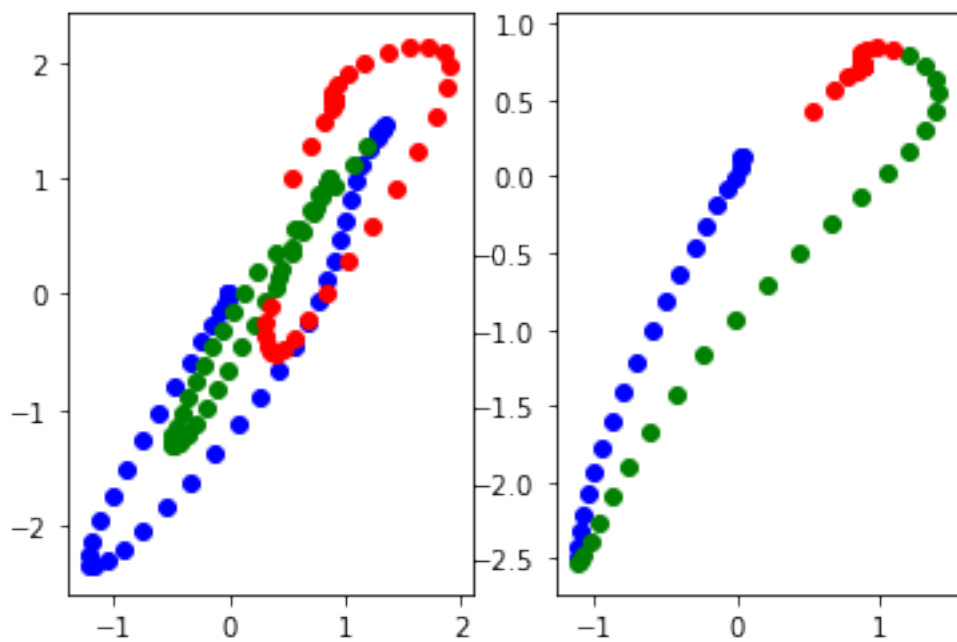
['w'] ['m'] -241.4946017743027



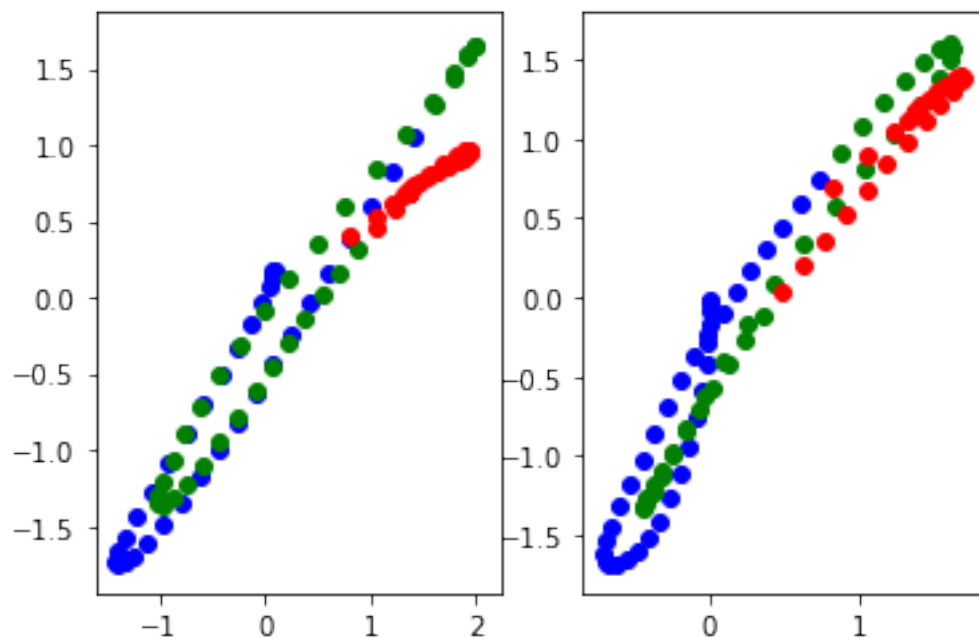
['w'] ['w'] -252.67710092845377 True  
['w'] ['w'] -251.15498419736187 True  
['w'] ['w'] -256.32890994033033 True  
['w'] ['w'] -283.5827632750598 True  
['w'] ['m'] -240.6249795242122 False  
['w'] ['m'] -240.6249795242122



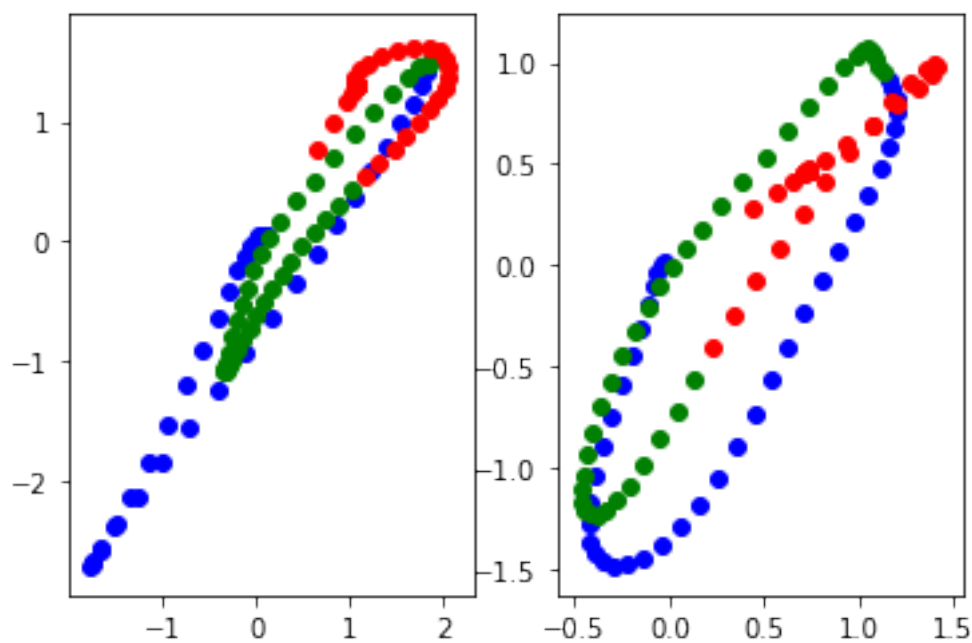
```
['w'] ['1'] -312.47927553342356 False
['w'] ['1'] -312.47927553342356
```



```
['w'] ['n'] -263.0845526526136 False
['w'] ['n'] -263.0845526526136
```

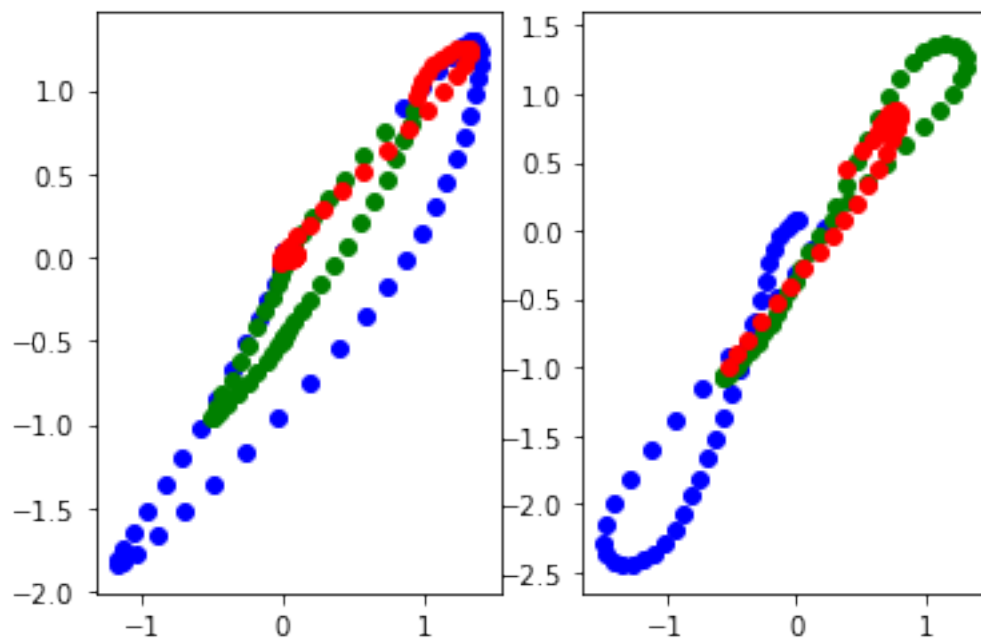


```
['w'] ['u'] -285.36177691802845 False
['w'] ['u'] -285.36177691802845
```

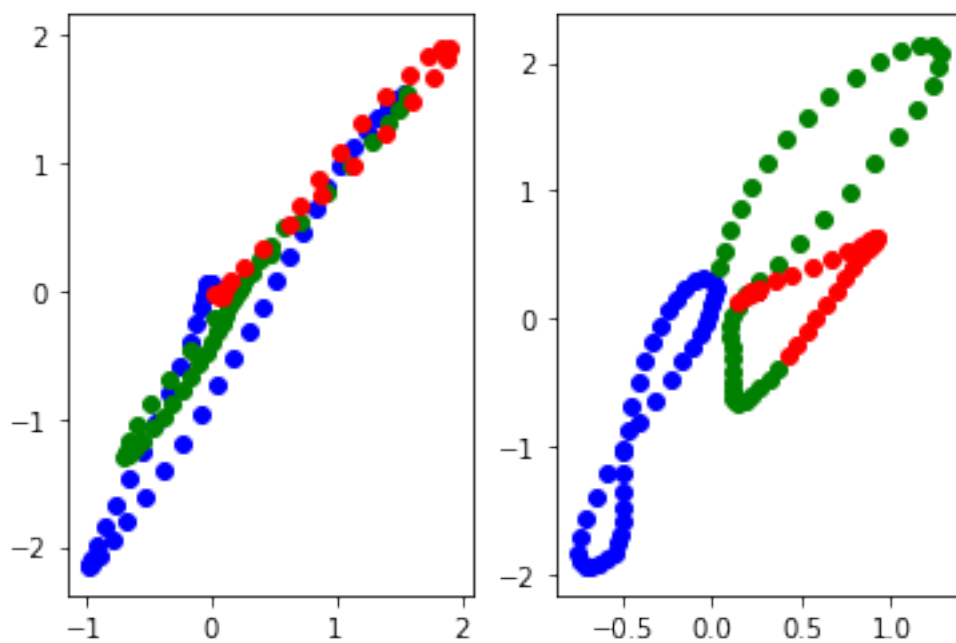


```
['w'] ['h'] -368.6009104912174 False
['w'] ['h'] -368.6009104912174
```



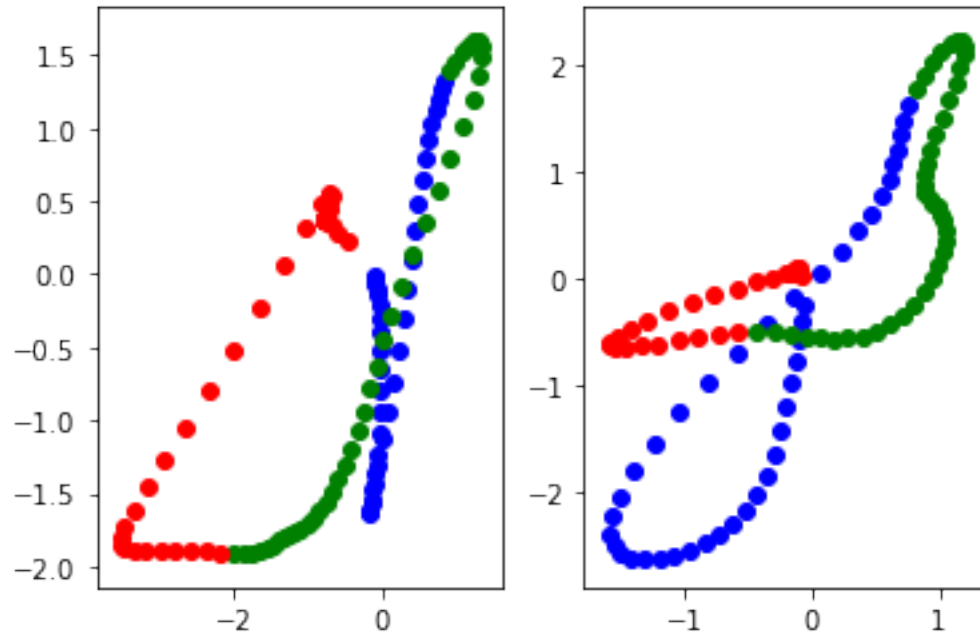


```
['w'] ['r'] -340.86896078658356 False
['w'] ['r'] -340.86896078658356
```

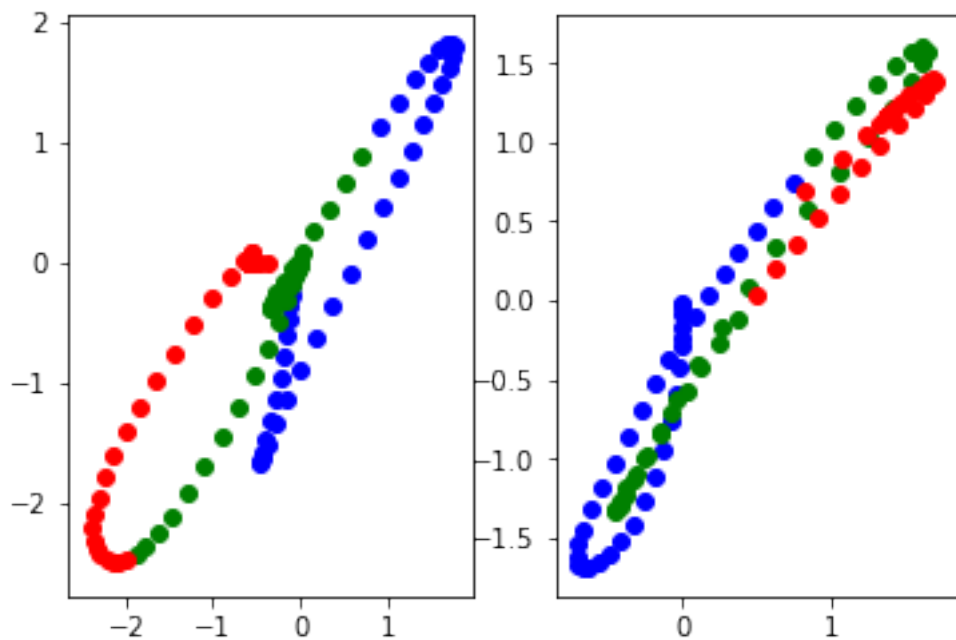


```
['w'] ['w'] -427.9503274308039 True
['y'] ['y'] -272.0841751641589 True
```

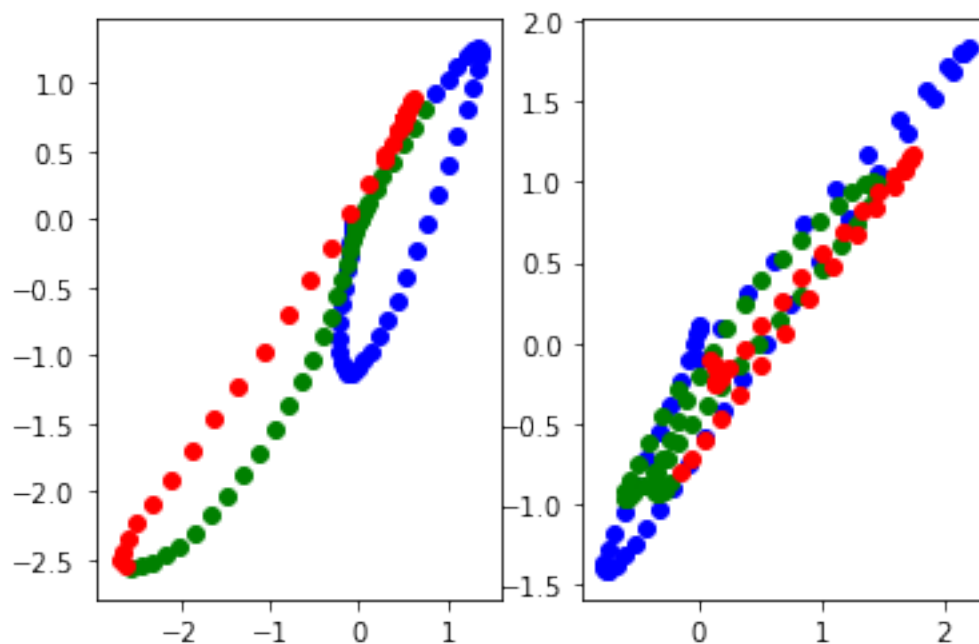
```
['y'] ['y'] -300.7845885106664 True
['y'] ['y'] -319.70321242152016 True
['y'] ['p'] -344.8192009183978 False
['y'] ['p'] -344.8192009183978
```



```
['y'] ['y'] -322.4454085625724 True
['y'] ['n'] -266.6859730874762 False
['y'] ['n'] -266.6859730874762
```

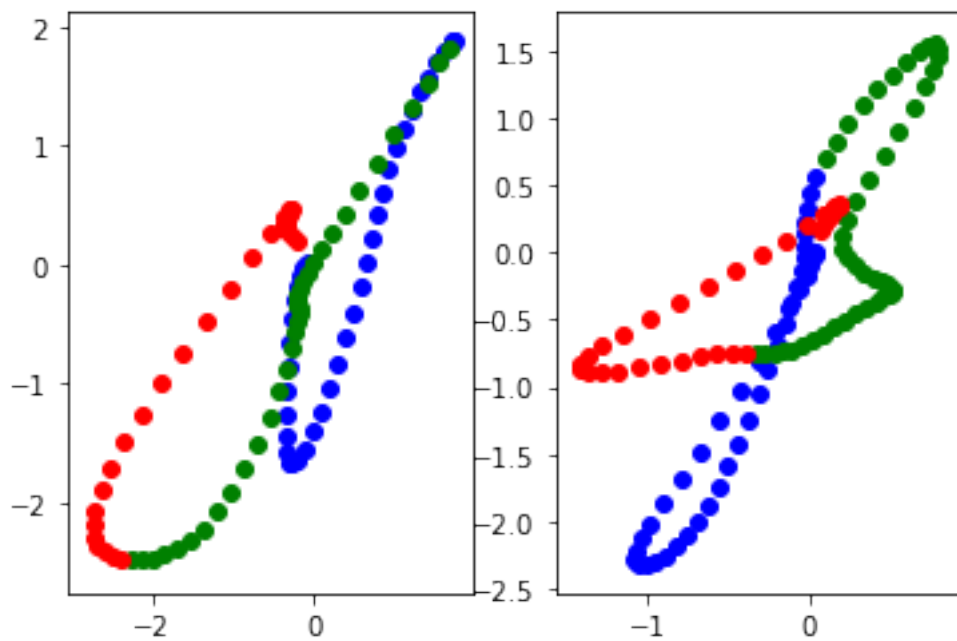


```
['y'] ['m'] -270.4539842022528 False
['y'] ['m'] -270.4539842022528
```

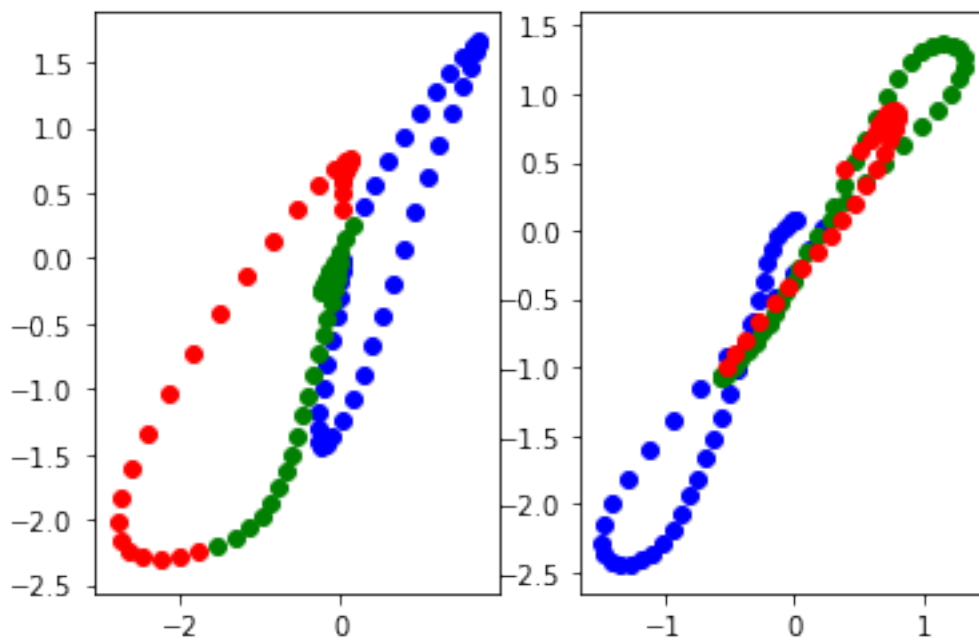


```
['y'] ['b'] -315.5595642205855 False
```

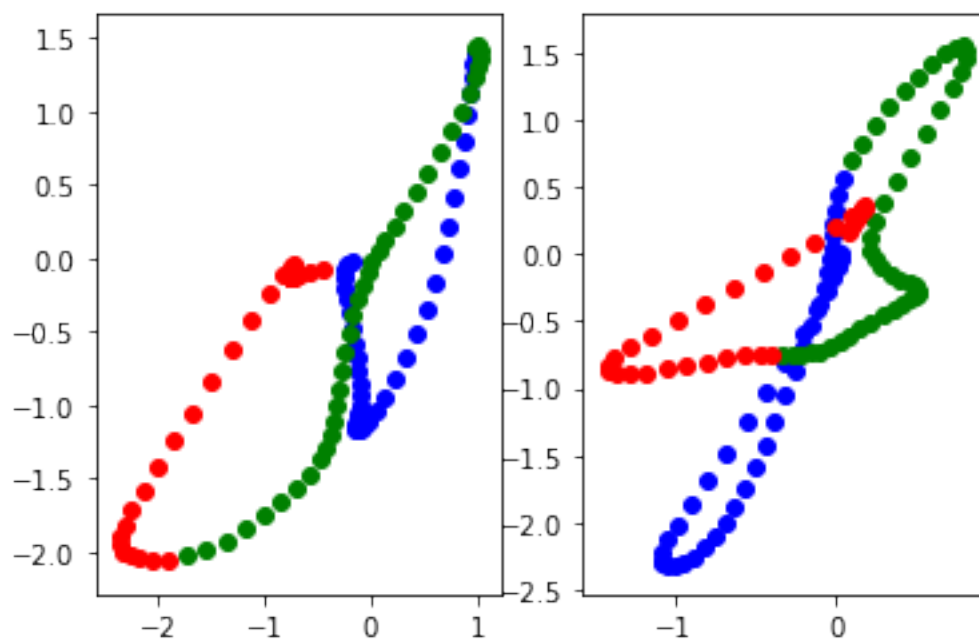
['y'] ['b'] -315.5595642205855



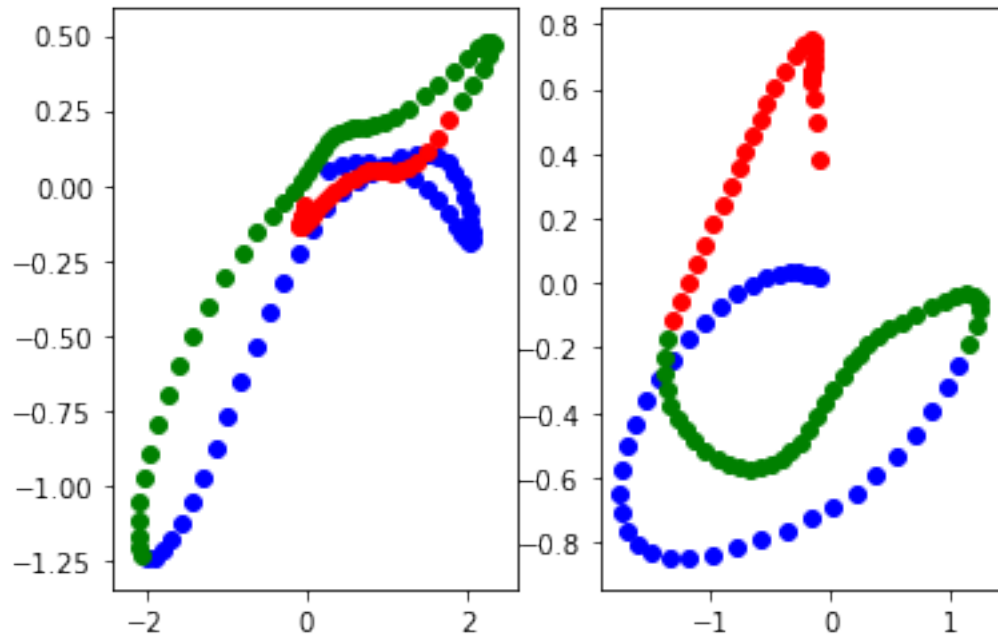
['y'] ['y'] -305.0703160201257 True  
['y'] ['h'] -284.45526664720467 False  
['y'] ['h'] -284.45526664720467



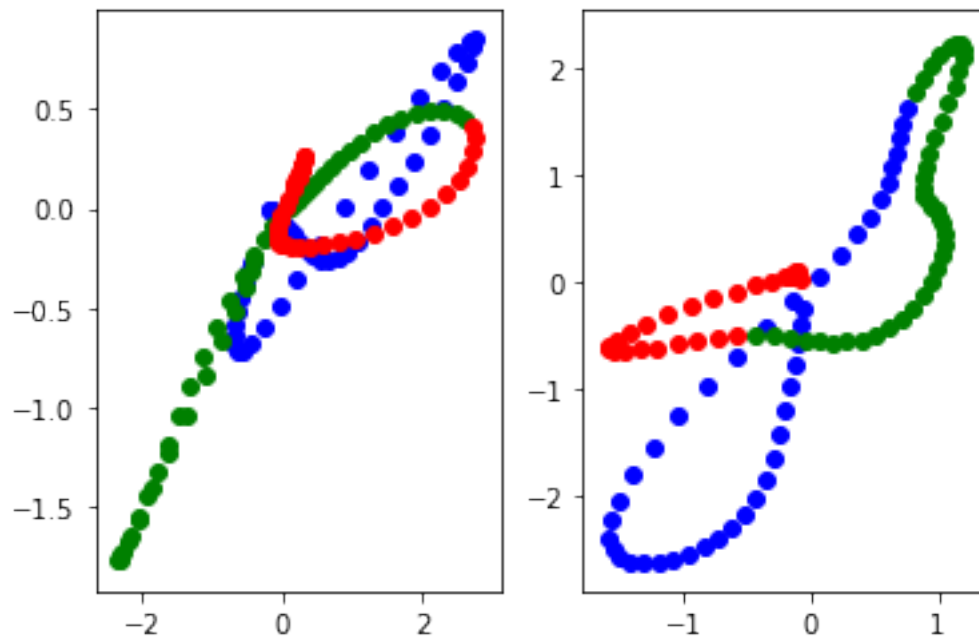
```
['y'] ['y'] -233.71796618027855 True
['y'] ['b'] -327.0494877554577 False
['y'] ['b'] -327.0494877554577
```



```
['z'] ['z'] -395.58875083785904 True
['z'] ['z'] -470.04070293427003 True
['z'] ['s'] -412.1075299969442 False
['z'] ['s'] -412.1075299969442
```



```
['z'] ['z'] -421.62507936098683 True
['z'] ['z'] -482.03914683854026 True
['z'] ['z'] -456.7292416943623 True
['z'] ['z'] -467.88283978963034 True
['z'] ['z'] -502.39100934849057 True
['z'] ['z'] -410.74169493234496 True
['z'] ['z'] -371.4023994274074 True
['z'] ['z'] -458.95331513572813 True
['z'] ['p'] -409.2003867842454 False
['z'] ['p'] -409.2003867842454
```



```
['z'] ['z'] -373.7356818550305 True
['z'] ['z'] -383.4966091680567 True
['z'] ['z'] -432.4676580672184 True
['z'] ['z'] -408.5168931980977 True
['z'] ['z'] -413.2657001756291 True
['z'] ['z'] -424.6817960382378 True
['z'] ['z'] -476.50399868979827 True
['z'] ['z'] -456.7412272197892 True
['z'] ['z'] -382.53582802545776 True
(Wrong, Total) (82, 286)
Accuracy: 71.32867132867133%
```

[ ]: