In [2]:

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import random
import datetime
from collections import deque, defaultdict
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import tensorflow as tf
from tensorflow.keras.models import Sequential
from tensorflow.keras.layers import Dense, Conv2D, Flatten, Dropout
from tensorflow.keras.optimizers import Adam
from lightgbm import LGBMClassifier, plot_importance
class Simulator:
         def __init__(self):
                  self.sample_submission = pd.read_csv('module/sample_submission.csv')
                  self.max_count = pd.read_csv('module/max_count.csv')
                  self.stock = pd.read_csv('module/stock.csv')
                  self.order = pd.read_csv('module/order.csv')
                  cut = \{f'BLK_{i}': 506 \text{ if } i \le 2 \text{ else } 400 \text{ for } i \text{ in } range(1,5) \}
                  ratio = {}
                  ratio['BLK_1'] = \{\}
                  ratio['BLK_1'][4] = 0.851
                  ratio['BLK_1'][5] = 0.851
                  ratio['BLK_1'][6] = 0.851
                  ratio['BLK_2'] = \{\}
                  ratio['BLK_2'][4] = 0.901
                  ratio['BLK_2'][5] = 0.901
                   ratio['BLK_2'][6] = 0.901
                  ratio['BLK_3'] = \{\}
                   ratio['BLK_3'][4] = 0.710
                   ratio['BLK_3'][5] = 0.742
                   ratio['BLK_3'][6] = 0.759
                  ratio['BLK_4'] = \{\}
                   ratio['BLK_4'][4] = 0.700
                   ratio['BLK_4'][5] = 0.732
                  ratio['BLK_4'][6] = 0.749
                  self.cut = cut
                  self.ratio = ratio
                  order_dic = { }
                  order = self.order
                   for time, BLK_1, BLK_2, BLK_3, BLK_4 in zip(order['time'],order['BLK_1'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['BLK_2'],order['B
                            order_count_time = str(pd.to_datetime(time) + pd.Timedelta(hours=18))
                            order_dic[order_count_time] = {}
                            order_dic[order_count_time][1] = BLK_1
                            order_dic[order_count_time][2] = BLK_2
                            order_dic[order_count_time][3] = BLK_3
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order_dic[order_count_time][4] = BLK_4
             self.order_dic = order_dic
def make_init(self):
             PRT_dic = {time : {i : 0 for i in range(1,5)} for time in self.sample_submission['time']}
             MOL_dic = {time : {i : 0 for i in range(1,5)} for time in self.sample_submission['time']}
             BLK_dic = {time : {i : 0 for i in range(1,5)} for time in self.sample_submission['time']}
              ## 4/1일 00:00:00에 기초재고를 추가
              for i in range(1,5):
                          PRT_dic['2020-04-01 00:00:00'][i] = int(self.stock[f'PRT_{i}'])
                          MOL_dic['2020-04-01\ 00:00:00'][i] = int(self.stock[f'MOL_{i}'])
                          BLK_dic['2020-04-01\ 00:00:00'][i] = int(self.stock[f'BLK_{i}'])
             self.PRT_dic = PRT_dic
             self.MOL\_dic = MOL\_dic
             self.BLK_dic = BLK_dic
def cal prt mol(self.machine name):
             df = self.df
              # PRT 개수와 MOL 개수 구하기
             process_list = []
              for time, event, mol in zip(self.sample_submission['time'],df[f'Event_{machine_name}'],df[f
                           # check한 몰의 개수만큼 PRT로
                           try:
                                       val = int(event[-1])
                           except:
                                        pass
                           if event == 'PROCESS':
                                        process_list.append((time,mol,val))
                          self.PRT_dic[time][val] += -mol
              for p_start, p_end in zip(process_list[:-48],process_list[48:]):
                          p_start_time, p_start_mol, p_start_number = p_start
                          p_end_time, p_end_mol, p_end_number = p_end
                          self.MOL_dic[p_end_time][p_start_number] += p_start_mol * 0.975
def cal_blk(self):
             PRT_dic = self.PRT_dic
             MOL\_dic = self.MOL\_dic
             BLK_dic = self.BLK_dic
             order_dic = self.order_dic
             ratio = self.ratio
             cut = self.cut
             PRT_stock_dic = {time : {i : 0 for i in range(1,5)} for time in self.sample_submission['timestate of time in self.sample_submission['timestate of timestate of ti
             MOL_stock_dic = {time : {i : 0 for i in range(1,5)} for time in self.sample_submission['timestock_dic = {time : {i : 0 for i in range(1,5)} for time in self.sample_submission['timestock_dic = {time : {i : 0 for i in range(1,5)} for time in self.sample_submission['timestock_dic = {time : {i : 0 for i in range(1,5)} for time in self.sample_submission['timestock_dic = {time : {i : 0 for i in range(1,5)} for time in self.sample_submission['timestock_dic = {time : {i : 0 for i in range(1,5)} for timestock_dic = {time : {i : 0 for i in range(1,5)} for timestock_dic = {time : {i : 0 for i in range(1,5)} for timestock_dic = {time : {i : 0 for i in range(1,5)} for timestock_dic = {time : {i : 0 for i in range(1,5)} for timestock_dic = {time : {i : 0 for i in range(1,5)} for timestock_dic = {time : {i : 0 for i i in range(1,5)} for timestock_dic = {time : {i : 0 for i i in range(1,5)} for timestock_dic = {time : {i : 0 for i i in range(1,5)} for timestock_dic = {time : {i : 0 for i i in range(1,5)} for timestock_dic = {time : {i : 0 for i :
             BLK_stock_dic = {time : {i : 0 for i in range(1,5)} for time in self.sample_submission['timestate in self.sample_submission['timestate in self.sample_submission['timestate in self.sample_submission]
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blk_diffs = []
   previous_time = [self.sample_submission['time'][0]] + list(self.sample_submission['time'])
    for time, previous in zip(self.sample submission['time'], previous_time[:-1]):
       month = int(time[6])
        for i in range(1,5):
            if str(time) == '2020-04-01 00:00:00':
                PRT_stock_dic[time][i] = PRT_dic[time][i]
                MOL_stock_dic[time][i] = MOL_dic[time][i]
                BLK_stock_dic[time][i] = BLK_dic[time][i]
            else:
                PRT_stock_dic[time][i] = PRT_stock_dic[previous][i] + PRT_dic[time][i]
                MOL_stock_dic[time][i] = MOL_stock_dic[previous][i] + MOL_dic[time][i]
                BLK_stock_dic[time][i] = BLK_stock_dic[previous][i] + BLK_dic[time][i]
                if int(time[11:13]) == 18:
                    val = order dic[time][i]
                    if val > 0:
                        mol_number = i
                        mol = MOL_stock_dic[time][i]
                        MOL_stock_dic[time][i] = 0
                        blk_gen = int(mol*ratio[f'BLK_{i}'][month]*cut[f'BLK_{i}'])
                        blk_stock = BLK_stock_dic[time][i] + blk_gen
                        blk_diff = blk_stock - val
                        BLK_stock_dic[time][i] = blk_diff
                        blk_diffs.append(blk_diff)
    self.PRT_stock_dic = PRT_stock_dic
    self.MOL_stock_dic = MOL_stock_dic
    self.BLK_stock_dic = BLK_stock_dic
   self.blk_diffs = blk_diffs
def F(self, x, a): return 1 - x/a if x < a else 0
def cal_change_stop_time(self):
   df = self.df
    change_type = { 'A': '', 'B': ''}
    change_num = 0
    change_time = 0
    stop_num = 0
    stop\_time = 0
    previous_event = {'A':'', 'B':''}
    for row in df.iterrows():
        for machine in ['A', 'B']:
            if 'CHANGE' in row[1][f'Event_{machine}']:
                change_time += 1
                if change_type[machine] != row[1][f'Event_{machine}'][-2:]:
                    change_num += 1
                    change_type[machine] = row[1][f'Event_{machine}'][-2:]
            if 'STOP' == row[1][f'Event_{machine}']:
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stop_time += 1
                if previous_event[machine] != 'STOP':
                     stop_num += 1
            previous_event[machine] = row[1][f'Event_{machine}']
    return change_time, change_num, stop_time, stop_num
def cal_score(self):
    p = 0
    q = 0
    for item in self.blk_diffs:
        if item < 0:
            p = p + abs(item)
        if item > 0:
            q = q + abs(item)
    N = sum([sum(self.order[f'BLK_{i}]) for i in range(1,5)])
    M = len(self.df) * 2
    c, c_n, s, s_n = self.cal_change_stop_time()
    self.score = 50*self.F(p, 10*N)+20*self.F(q, 10*N)+W
            20*self.F(c, M)/(1+0.1*c_n) + 10*self.F(s, M)/(1+0.1*s_n)
    self.p = p
    self.q = q
    self.N = N
    self.M = M
    self.c = c
    self.c_n = c_n
    self.s = s
    self.s_n = s_n
    return self.score
def make_stock_df(self):
    PRT_{I} = \{i : [] \text{ for } i \text{ in } range(1,5)\}
    MOL_I = \{i : [] \text{ for } i \text{ in } range(1.5)\}
    BLK_1 = \{i : [] \text{ for } i \text{ in } range(1,5)\}
    for time in self.sample_submission['time']:
        for i in range(1,5):
            PRT_I[i].append(self.PRT_stock_dic[time][i])
            MOL_I[i].append(self.MOL_stock_dic[time][i])
            BLK_I[i].append(self.BLK_stock_dic[time][i])
    df_stock = pd.DataFrame(index = self.sample_submission['time'])
    for i in range(1,5):
        df_stock[f'PRT_{i}'] = PRT_I[i]
    for i in range(1.5):
        df_stock[f'MOL_{i}] = MOL_{i}
    for i in range(1,5):
        df_stock[f'BLK_{i}'] = BLK_{i}
    self.df_stock = df_stock
def get_score(self,df):
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self.df = df
       self.make_init()
       self.cal_prt_mol('A')
       self.cal_prt_mol('B')
       self.cal_blk()
       self.cal_score()
       self.make_stock_df()
       return self.score, self.df_stock
submission_ini = pd.read_csv('module/sample_submission.csv')
order_ini = pd.read_csv('module/order.csv')
order = order_ini.copy()
for i in range(35):
   order.loc[91+i,:] = ['0000-00-00', 0, 0, 0, 0]
class Env:
   def __init__(self):
        # Event 종류
       self.mask = np.zeros([5], np.bool) # 가능한 이벤트 검사용 마스크
       self.event_map = {0:'CHECK_1', 1:'CHECK_2', 2:'CHECK_3', 3:'CHECK_4', 4:'PROCESS'}
       self.simulator = Simulator()
       self.sample_submission = pd.read_csv('module/sample_submission.csv')
        self.max_count = pd.read_csv('module/max_count.csv')
        self.stock = pd.read_csv('module/stock.csv')
        self.order = pd.read_csv('module/order.csv')
       cut = np.zeros(4) # b/k_type
       cut[0] = 506
       cut[1] = 506
       cut[2] = 400
       cut[3] = 400
       ratio = np.zeros((3, 4)) # month, b/k_type
        ratio[0][0] = 0.851
        ratio[1][0] = 0.851
        ratio[2][0] = 0.851
        ratio[0][1] = 0.901
        ratio[1][1] = 0.901
        ratio[2][1] = 0.901
        ratio[0][2] = 0.710
        ratio[1][2] = 0.742
        ratio[2][2] = 0.759
        ratio[0][3] = 0.700
        ratio[1][3] = 0.732
        ratio[2][3] = 0.749
       self.cut = cut
       self.ratio = ratio
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self.order = self.order.values[:, 1:]
   self.reset()
def done(self):
   return self.s >= self.s_max
def state(self):
    inputs = np.array(order.loc[self.s//24:(self.s//24+30), 'BLK_1':'BLK_4']).reshape(-1)
    inputs = np.append(inputs, self.s%24)
    return inputs
def states(self):
   all_states = np.zeros((self.submission.shape[0] + 1, 125))
    for i in range(self.submission.shape[0] + 1):
       all_states[i][0:124] = np.array(order.loc[i//24:(i//24+30), 'BLK_1':'BLK_4']).reshape(-
       all_states[i][124] = i % 24
    return all_states
def reset(self):
   self.mask = np.zeros([5], np.bool)
   self.simulator = Simulator()
    self.submission = submission_ini.copy()
    self.submission.loc[:, 'PRT_1':'PRT_4'] = 0
    self.s = 0
    self.s_max = self.submission.shape[0]
   self.check\_time = 28
   self.process = 0
    self.process\_mode = 0
    self.process_time = 0
   self.last_score = 30
   self.global_process_time = 0
   self.PRT_stock = np.zeros(4)
   self.MOL\_stock = np.zeros(4)
    self.BLK\_stock = np.zeros(4)
    for i in range(4):
       self.PRT_stock[i] = int(self.stock[f'PRT_{i + 1}'])
       self.MOL\_stock[i] = int(self.stock[f'MOL\_{i + 1}'])
       self.BLK_stock[i] = int(self.stock[f'BLK_{i + 1}'])
    self.process_A = np.zeros((self.submission.shape[0], 4))
    self.process_B = np.zeros((self.submission.shape[0], 4))
   self.update_mask()
def step(self, actions):
   day = self.s // 24
    if day <= 30:
       month = 0
    elif day <= 61:
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month = 1
else:
    month = 2
action1, action2 = actions
out1 = self.event_map[action1]
out2 = action2 / 2
if out1 == 'CHECK_1':
    if self.process == 1:
        self.process = 0
        self.check\_time = 28
    self.check_time -= 1
    self.process\_mode = 0
    if self.check_time == 0:
        self.process = 1
        self.process_time = 0
elif out1 == 'CHECK_2':
    if self.process == 1:
        self.process = 0
        self.check time = 28
    self.check_time -= 1
    self.process\_mode = 1
    if self.check_time == 0:
        self.process = 1
        self.process_time = 0
elif out1 == 'CHECK 3':
    if self.process == 1:
        self.process = 0
        self.check\_time = 28
    self.check_time -= 1
    self.process\_mode = 2
    if self.check_time == 0:
        self.process = 1
        self.process_time = 0
elif out1 == 'CHECK_4':
    if self.process == 1:
        self.process = 0
        self.check_time = 28
    self.check_time -= 1
    self.process_mode = 3
    if self.check_time == 0:
        self.process = 1
        self.process_time = 0
elif out1 == 'PROCESS':
    self.process_time += 1
    self.global_process_time += 1
    if self.global_process_time >= 48:
        for i in range(4):
            self.MOL_stock[i] += self.process_A[self.global_process_time - 48][i] * 0.975
            self.MOL_stock[i] += self.process_B[self.global_process_time - 48][i] * 0.975
    if self.process_time == 140:
        self.process = 0
        self.check\_time = 28
self.submission.loc[self.s, 'Event_A'] = out1
if self.submission.loc[self.s, 'Event_A'] == 'PROCESS' and self.s >= 24*23:
    self.submission.loc[self.s, 'MOL_A'] = out2
    self.process_A[self.global_process_time][self.process_mode] += out2
    self.process_B[self.global_process_time][self.process_mode] += out2
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else:
           self.submission.loc[self.s, 'MOL_A'] = 0
       self.submission.loc[self.s, 'Event_B'] = self.submission.loc[self.s, 'Event_A']
       self.submission.loc[self.s, 'MOL_B'] = self.submission.loc[self.s, 'MOL_A']
       self.update_mask()
       self.s += 1
        if self.s % 24 == 18:
           blk_diff = 0
           for i in range(4):
                if self.order[day][i] != 0:
                   self.BLK_stock[i] += int(self.MOL_stock[i] * self.cut[i] * self.ratio[month][i]
                   self.MOL\_stock[i] = 0
                   self.BLK_stock[i] -= self.order[day][i]
                    if self.BLK_stock[i] < 0:</pre>
                       blk_diff += abs(self.BLK_stock[i]) * 5
                   elif self.BLK_stock[i] > 0:
                       blk_diff += abs(self.BLK_stock[i]) * 2
           if blk_diff != 0:
               blk_diff = 500000
           reward = -(blk_diff / 50000000)
           # print(f"{month+4}/{(day % 30)+1}", self.s, self.s_max)
            # print("MOL_STOCK", self.MOL_stock)
           # print("BLK_STOCK", self.BLK_stock)
           # print("blk_diff: ", blk_diff)
           # print(reward)
           # print()
       else:
           reward = 0
       return reward
   def get_score(self):
       score, stock = self.simulator.get_score(self.submission)
       return score
   def update_mask(self):
       self.mask[:] = False
        if self.process == 0:
           if self.check_time == 28:
               self.mask[:4] = True
           if self.check_time < 28:</pre>
               self.mask[self.process_mode] = True
        if self.process == 1:
           self.mask[4] = True
           if self.process_time > 98:
               self.mask[:4] = True
#모델 변수 설정
input_length = 125
                                       # 입력 데이터 길이
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```
# Event (CHECK_1~4, PROCESS)
output_length_1 = 5
output_length_2 = 12
                                       # MOL(0~5.5, step:0.5)
alpha = 0.01
alpha_decay = 0.01
dropout = 0.3
#모델 생성
model1 = Sequential()
model1.add(Dense(50, input_dim=input_length, activation='relu'))
# mode | 1.add(Dropout(dropout))
model1.add(Dense(50, activation='relu'))
# model1.add(Dropout(dropout))
model1.add(Dense(50, activation='relu'))
# model1.add(Dropout(dropout))
model1.add(Dense(output_length_1, activation='linear'))
model1.compile(loss='mse', optimizer=Adam(|r=a|pha, decay=a|pha_decay))
mode12 = Sequential()
model2.add(Dense(50, input_dim=input_length, activation='relu'))
# mode | 2. add(Dropout (dropout))
model2.add(Dense(50, activation='relu'))
# mode | 2. add(Dropout (dropout))
model2.add(Dense(50, activation='relu'))
# mode 12. add(Dropout(dropout))
model2.add(Dense(output_length_2, activation='linear'))
model2.compile(loss='mse', optimizer=Adam(lr=alpha, decay=alpha_decay))
# 학습 변수 설정
EPOCHS = 500
CHECK EPOCH = 1
THRESHOLD = 90
batch\_size = 2000
memory_size = 50000
gamma = 0.98
epsilon = 1
epsilon_min = 0.001
epsilon_decay = 0.95
memory = deque(maxlen=memory_size)
score_history = []
scores = deque(maxlen=CHECK_EPOCH)
avg scores = []
#%% start train
for e in tf.range(EPOCHS):
    env = Env()
    if e % CHECK_EPOCH == 0:
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```
print()
   print(f'epoch {e} start, epsilon: ', epsilon, ' time: ', datetime.datetime.now())
done = False
i = 0
# before_time = datetime.datetime.now()
states = env.states()
predicts1 = model1.predict(states)
predicts2 = model2.predict(states)
reward_sum = 0
action_dict = defaultdict(int)
out1_dict = defaultdict(int)
mask_dict = defaultdict(int)
while not done:
    # if i % 500 == 0:
         print(i, 'STEP! ', datetime.datetime.now())
          print('TIME: ', datetime.datetime.now() - before_time)
          print('Epsilon: ', epsilon1)
          before_time = datetime.datetime.now()
    # action 선택
    if np.random.random() <= epsilon:</pre>
       out1 = np.random.rand(output_length_1)
    else:
       out1 = predicts1[i]
    if np.random.random() <= epsilon:</pre>
       out2 = np.random.rand(output_length_2)
    else:
       out2 = predicts2[i]
   env.update_mask()
   action1 = np.argmax(out1 * env.mask)
    action2 = np.argmax(out2)
    # print(action1)
    action_dict[action1] += 1
    out1_dict[np.argmax(out1)] += 1
   mask_dict[tuple(env.mask)] += 1
    reward = env.step((action1, action2))
    reward_sum += reward
   done = env.done()
    # memory에 저장
    memory.append((states[i][np.newaxis, :], (action1, action2), reward, states[i + 1][np.newaxi
    i += 1
epsilon = max(epsilon_min, epsilon_decay * epsilon)
score = env.get_score()
s = env.simulator
```

```
print('부족분 점수: ', 50 * s.F(s.p, 10*s.N))
print('추가분 점수: ', 20 * s.F(s.q, 10*s.N))
    print('기타 점수: ', 20*s.F(s.c, s.M)/(1+0.1*s.c_n) + 10*s.F(s.s, s.M)/(1 + 0.1*s.s_n))
    scores.append(score)
    mean_score = np.average(scores)
    avg_scores.append(mean_score)
    score_history.append([e, score])
    # early-stop 확인 / 현재 상태
    if mean_score >= THRESHOLD and e >= CHECK_EPOCH:
        print(f'Ran {e + 1} times. Solved afer {e-CHECK_EPOCH} trials!')
        break
    if e % CHECK EPOCH == 0:
        print(f'[Episode {e + 1}] - Mean score over last {CHECK_EPOCH} times:{mean_score}')
    # replay
    x_batch1, y_batch1 = [], []
    x_batch2, y_batch2 = [], []
    minibatch = random.sample(memory, min(len(memory), batch_size))
    state = minibatch[0][0]
    states = np.empty((batch_size, state.shape[1]))
    next_states = np.empty((batch_size, state.shape[1]))
    for i, (state, actions, reward, next_state, done) in enumerate(minibatch):
        states[i] = np.squeeze(state)
        next_states[i] = np.squeeze(next_state)
    y_targets1 = model1.predict(states)
    y_targets2 = model2.predict(states)
    predicts1 = model1.predict(next_states)
    predicts2 = model2.predict(next_states)
    for i. (state, actions, reward, next_state, done) in enumerate(minibatch):
        action1, action2 = actions
        y_targets1[i][action1] = reward if done else reward + gamma * np.max(predicts1[i])
        x_batch1.append(state[0])
        y_batch1.append(y_targets1[i])
        y_targets2[i][action2] = reward if done else reward + gamma * np.max(predicts2[i])
        x_batch2.append(state[0])
        y_batch2.append(y_targets2[i])
    model1.fit(np.array(x_batch1), np.array(y_batch1), batch_size=len(minibatch), verbose=0)
    model2.fit(np.array(x_batch2), np.array(y_batch2), batch_size=len(minibatch), verbose=0)
    env.reset()
#% show graph
score_history = np.array(score_history)
plt.plot(score_history[:,0], score_history[:,1], '-o', label='score')
```

```
plt.legend()
plt.xlim(0, EPOCHS)
plt.ylim(bottom=0)
plt.xlabel('Epochs')
plt.ylabel('Score')
plt.show()
env = Env()
done = False
while not env.done():
    state = env.state()[np.newaxis, :]
    # action 선택
    out1 = model1.predict(state)
    out2 = model2.predict(state)
    action1 = np.argmax(out1 * env.mask)
    action2 = np.argmax(out2)
    reward = env.step((action1, action2))
#재고계산
simulator = Simulator()
_, df_stock = simulator.get_score(env.submission)
# PRT 개수 계산
PRTs = df_stock[['PRT_1', 'PRT_2', 'PRT_3', 'PRT_4']].values
PRTs = (PRTs[:-1] - PRTs[1:])[24*23:]
PRTs = np.ceil(PRTs * 1.1)
PAD = np.zeros((24*23+1, 4))
PRTs = np.append(PRTs, PAD, axis=0).astype(int)
# Submission 파일에 PRT 입력
env.submission.loc[:, 'PRT_1':'PRT_4'] = PRTs
env.submission.to_csv('submission_dqn.csv', index=False)
                                  2020-06-29 01:39:04.501759
epoch 0 start, epsilon: 1 time:
```

```
부족분 점수: 45.092702705276636
추가분 점수: 6.783113671755836
기타 점수: 30.0
[Episode 1] - Mean score over last 1 times:81.87581637703246
epoch 1 start, epsilon: 0.95 time: 2020-06-29 01:39:19.390025
부족분 점수: 29.23554483864159
추가분 점수: 0
기타 점수: 30.0
[Episode 2] - Mean score over last 1 times:59.23554483864159
epoch 2 start, epsilon: 0.9025 time: 2020-06-29 01:39:32.308480
부족분 점수: 25.968814005664377
추가분 점수: 0
기타 점수: 30.0
[Episode 3] - Mean score over last 1 times:55.96881400566438
epoch 3 start, epsilon: 0.857374999999999 time: 2020-06-29 01:39:44.986575
부족분 점수: 33.29719549393978
```

```
추가분 점수: 0
기타 점수: 30.0
```

[Episode 4] - Mean score over last 1 times:63.29719549393978

epoch 4 start, epsilon: 0.8145062499999999 time: 2020-06-29 01:39:58.128432

부족분 점수: 39.14572378031528 추가분 점수: 5.584304301917955

기타 점수: 30.0

[Episode 5] - Mean score over last 1 times:74.73002808223323

epoch 5 start, epsilon: 0.7737809374999999 time: 2020-06-29 01:40:11.700101

부족분 점수: 45.059958532547405 추가분 점수: 4.051252763754412

기타 점수: 30.0

[Episode 6] - Mean score over last 1 times:79.11121129630182

epoch 6 start, epsilon: 0.7350918906249998 time: 2020-06-29 01:40:27.008250

부족분 점수: 38.16962578219972 추가분 점수: 5.966505308774002

기타 점수: 30.0

[Episode 7] - Mean score over last 1 times:74.13613109097372

epoch 7 start, epsilon: 0.6983372960937497 time: 2020-06-29 01:40:40.622264

부족분 점수: 46.430584104921444 추가분 점수: 1.833611001624229

기타 점수: 30.0

[Episode 8] - Mean score over last 1 times:78.26419510654567

epoch 8 start, epsilon: 0.6634204312890623 time: 2020-06-29 01:40:53.704303

부족분 점수: 39.53628217775092

추가분 점수: 0 기타 점수: 30.0

[Episode 9] - Mean score over last 1 times:69.53628217775092

epoch 9 start, epsilon: 0.6302494097246091 time: 2020-06-29 01:41:07.731267

부족분 점수: 48.02023635034806

추가분 점수: 0 기타 점수: 30.0

[Episode 10] - Mean score over last 1 times:78.02023635034806

epoch 10 start, epsilon: 0.5987369392383786 time: 2020-06-29 01:41:21.632159

부족분 점수: 26.38519509333556

추가분 점수: 0 기타 점수: 30.0

[Episode 11] - Mean score over last 1 times:56.38519509333556

epoch 11 start, epsilon: 0.5688000922764596 time: 2020-06-29 01:41:36.718247

부족분 점수: 36.95996538337118 추가분 점수: 3.4285608078196472

기타 점수: 30.0

[Episode 12] - Mean score over last 1 times:70.38852619119083

epoch 12 start, epsilon: 0.5403600876626365 time: 2020-06-29 01:41:49.510228

부족분 점수: 10.385811974686977 추가분 점수: 0.137568227906939

기타 점수: 30.0

[Episode 13] - Mean score over last 1 times: 40.52338020259391

epoch 13 start, epsilon: 0.5133420832795047 time: 2020-06-29 01:42:02.698250

부족분 점수: 31.56855600917089 추가분 점수: 11.687753584163598

```
기타 점수: 30.0
```

[Episode 14] - Mean score over last 1 times:73.25630959333449

epoch 14 start, epsilon: 0.48767497911552943 time: 2020-06-29 01:42:17.594246

부족분 점수: 25.435996562914063 추가분 점수: 12.047303862912251

기타 점수: 30.0

[Episode 15] - Mean score over last 1 times:67.48330042582631

epoch 15 start, epsilon: 0.46329123015975293 time: 2020-06-29 01:42:31.415228

부족분 점수: 28.12568527438471 추가분 점수: 13.170520690255824

기타 점수: 30.0

[Episode 16] - Mean score over last 1 times:71.29620596464054

epoch 16 start, epsilon: 0.44012666865176525 time: 2020-06-29 01:42:44.789218

부족분 점수: 35.08621592752013

추가분 점수: 0 기타 점수: 30.0

[Episode 17] - Mean score over last 1 times:65.08621592752013

epoch 17 start, epsilon: 0.41812033521917696 time: 2020-06-29 01:42:57.442198

부족분 점수: 18.0164530366814 추가분 점수: 5.380182317931679

기타 점수: 30.0

[Episode 18] - Mean score over last 1 times:53.39663535461308

epoch 18 start, epsilon: 0.3972143184582181 time: 2020-06-29 01:43:10.245214

부족분 점수: 32.390117241250074

추가분 점수: 0 기타 점수: 30.0

[Episode 19] - Mean score over last 1 times:62.390117241250074

epoch 19 start, epsilon: 0.37735360253530714 time: 2020-06-29 01:43:22.717199

부족분 점수: 19.4082823694511 추가분 점수: 11.314032238194848

기타 점수: 30.0

[Episode 20] - Mean score over last 1 times:60.72231460764595

epoch 20 start, epsilon: 0.35848592240854177 time: 2020-06-29 01:43:35.863206

부족분 점수: 26.651228248250504 추가분 점수: 14.196804198233961

기타 점수: 30.0

[Episode 21] - Mean score over last 1 times:70.84803244648447

epoch 21 start, epsilon: 0.34056162628811465 time: 2020-06-29 01:43:48.529168

부족분 점수: 30.3592197188213 추가분 점수: 12.036639925925083

기타 점수: 30.0

[Episode 22] - Mean score over last 1 times:72.39585964474638

epoch 22 start, epsilon: 0.3235335449737089 time: 2020-06-29 01:44:03.237190

부족분 점수: 30.596864964733616 추가분 점수: 1.7580952620870183

기타 점수: 30.0

[Episode 23] - Mean score over last 1 times:62.35496022682064

epoch 23 start, epsilon: 0.30735686772502346 time: 2020-06-29 01:44:17.415179

부족분 점수: 13.681903042103688

추가분 점수: 0 기타 점수: 30.0 2020. 6. 29. [Episode 24] - Mean score over last 1 times:43.681903042103684 epoch 24 start, epsilon: 0.2919890243387723 time: 2020-06-29 01:44:31.123686 부족분 점수: 11.27890133677083 추가분 점수: 0 기타 점수: 30.0 [Episode 25] - Mean score over last 1 times:41.27890133677083 epoch 25 start, epsilon: 0.27738957312183365 time: 2020-06-29 01:44:45.334200 부족분 점수: 20.285750010061186 추가분 점수: 14.265088785754465 기타 점수: 30.0 [Episode 26] - Mean score over last 1 times:64.55083879581565 epoch 26 start, epsilon: 0.263520094465742 time: 2020-06-29 01:44:59.448504 부족분 점수: 13.749806072533326 추가분 점수: 16.131228604616226 기타 점수: 30.0 [Episode 27] - Mean score over last 1 times:59.88103467714955 epoch 27 start, epsilon: 0.25034408974245487 time: 2020-06-29 01:45:12.796075 부족분 점수: 29.211969402930738 추가분 점수: 0 기타 점수: 30.0 [Episode 28] - Mean score over last 1 times:59.211969402930734 epoch 28 start, epsilon: 0.2378268852553321 time: 2020-06-29 01:45:25.996291 부족분 점수: 31.00829072561283 추가분 점수: 9.149299725997771 기타 점수: 30.0 [Episode 29] - Mean score over last 1 times:70.1575904516106 epoch 29 start, epsilon: 0.2259355409925655 time: 2020-06-29 01:45:39.075315 부족분 점수: 30.68462309563228 추가분 점수: 0 기타 점수: 30.0 [Episode 30] - Mean score over last 1 times:60.684623095632276 epoch 30 start, epsilon: 0.2146387639429372 time: 2020-06-29 01:45:51.119109 부족분 점수: 19.171222362071873 추가분 점수: 6.493956682517772 기타 점수: 30.0 [Episode 31] - Mean score over last 1 times:55.66517904458965 epoch 31 start, epsilon: 0.20390682574579033 time: 2020-06-29 01:46:03.552859 부족분 점수: 12.661108795075272 추가분 점수: 6.16313808280772 기타 점수: 30.0 [Episode 32] - Mean score over last 1 times:48.82424687788299 epoch 32 start, epsilon: 0.1937114844585008 time: 2020-06-29 01:46:16.478294 부족분 점수: 19.89113334437248 추가분 점수: 0 기타 점수: 30.0 [Episode 33] - Mean score over last 1 times:49.89113334437248 epoch 33 start, epsilon: 0.18402591023557577 time: 2020-06-29 01:46:29.931938 부족분 점수: 47.34631805087612 추가분 점수: 0 기타 점수: 30.0

[Episode 34] - Mean score over last 1 times:77.34631805087612

```
epoch 34 start, epsilon: 0.17482461472379698 time: 2020-06-29 01:46:42.847400
부족분 점수: 28.98139770936716
추가분 점수: 0
기타 점수: 30.0
[Episode 35] - Mean score over last 1 times:58.98139770936716
epoch 35 start, epsilon: 0.16608338398760714 time: 2020-06-29 01:46:55.709056
부족분 점수: 12.017433964049456
추가분 점수: 14.906355997681167
기타 점수: 30.0
[Episode 36] - Mean score over last 1 times:56.92378996173062
epoch 36 start, epsilon: 0.15777921478822676 time: 2020-06-29 01:47:10.767955
부족분 점수: 11.016299737979029
추가분 점수: 15.299456880208584
기타 점수: 30.0
[Episode 37] - Mean score over last 1 times:56.31575661818761
epoch 37 start, epsilon: 0.14989025404881542 time: 2020-06-29 01:47:25.077953
부족분 점수: 7.7590801832088445
추가분 점수: 15.231176593653679
기타 점수: 30.0
[Episode 38] - Mean score over last 1 times:52.99025677686252
epoch 38 start, epsilon: 0.14239574134637464 time: 2020-06-29 01:47:38.862920
부족분 점수: 7.073919466876882
추가분 점수: 15.308195827879043
기타 점수: 30.0
[Episode 39] - Mean score over last 1 times:52.38211529475593
epoch 39 start, epsilon: 0.1352759542790559 time: 2020-06-29 01:47:52.082033
부족분 점수: 21.322966265376337
추가분 점수: 15.39012062058018
기타 점수: 30.0
[Episode 40] - Mean score over last 1 times:66.71308688595651
epoch 40 start, epsilon: 0.1285121565651031 time: 2020-06-29 01:48:05.646062
부족분 점수: 11.417326378467152
추가분 점수: 9.264275596044708
기타 점수: 30.0
[Episode 41] - Mean score over last 1 times:50.681601974511864
epoch 41 start, epsilon: 0.12208654873684793 time: 2020-06-29 01:48:18.412054
부족분 점수: 27.98504523540567
추가분 점수: 10.772398737605155
기타 점수: 30.0
[Episode 42] - Mean score over last 1 times:68.75744397301082
epoch 42 start, epsilon: 0.11598222130000553 time: 2020-06-29 01:48:31.811465
부족분 점수: 24.921508913904805
추가분 점수: 2.4366825669268644
기타 점수: 30.0
[Episode 43] - Mean score over last 1 times:57.35819148083167
epoch 43 start, epsilon: 0.11018311023500525 time: 2020-06-29 01:48:45.086907
부족분 점수: 30.597075404836065
추가분 점수: 0
기타 점수: 30.0
[Episode 44] - Mean score over last 1 times:60.59707540483606
```

```
epoch 44 start, epsilon: 0.10467395472325498 time: 2020-06-29 01:49:01.325542
부족분 점수: 33.26199977081997
추가분 점수: 0
기타 점수: 30.0
[Episode 45] - Mean score over last 1 times:63.26199977081997
epoch 45 start, epsilon: 0.09944025698709223 time: 2020-06-29 01:49:15.625532
부족분 점수: 43.19476031793966
추가분 점수: 0
기타 점수: 30.0
[Episode 46] - Mean score over last 1 times:73.19476031793965
epoch 46 start, epsilon: 0.09446824413773762 time: 2020-06-29 01:49:31.238474
부족분 점수: 30.319656979560893
추가분 점수: 0
기타 점수: 30.0
[Episode 47] - Mean score over last 1 times:60.31965697956089
epoch 47 start, epsilon: 0.08974483193085074 time: 2020-06-29 01:49:44.859509
부족분 점수: 24.2109064500045
추가분 점수: 0
기타 점수: 30.0
[Episode 48] - Mean score over last 1 times:54.2109064500045
epoch 48 start, epsilon: 0.0852575903343082 time: 2020-06-29 01:49:57.166528
부족분 점수: 34.76850052671468
추가분 점수: 0
기타 점수: 30.0
[Episode 49] - Mean score over last 1 times:64.76850052671469
epoch 49 start, epsilon: 0.08099471081759278 time: 2020-06-29 01:50:10.419546
부족분 점수: 33.76892079249592
추가분 점수: 0
기타 점수: 30.0
[Episode 50] - Mean score over last 1 times:63.76892079249592
epoch 50 start, epsilon: 0.07694497527671314 time: 2020-06-29 01:50:23.859040
부족분 점수: 39.17451260075396
추가분 점수: 1.1334961351215922
기타 점수: 30.0
[Episode 51] - Mean score over last 1 times:70.30800873587555
epoch 51 start, epsilon: 0.07309772651287748 time: 2020-06-29 01:50:39.780069
부족분 점수: 30.64756566883241
추가분 점수: 0
기타 점수: 30.0
[Episode 52] - Mean score over last 1 times:60.647565668832414
epoch 52 start, epsilon: 0.0694428401872336 time: 2020-06-29 01:50:54.600479
부족분 점수: 26.414698181275252
추가분 점수: 0
기타 점수: 30.0
[Episode 53] - Mean score over last 1 times: 56.414698181275256
epoch 53 start, epsilon: 0.0659706981778719 time: 2020-06-29 01:51:07.359531
부족분 점수: 36.14143325991995
추가분 점수: 2.790090452378633
기타 점수: 30.0
[Episode 54] - Mean score over last 1 times:68.93152371229858
```

```
epoch 54 start, epsilon: 0.0626721632689783 time: 2020-06-29 01:51:20.785504
부족분 점수: 37.452802278774456
추가분 점수: 0
기타 점수: 30.0
[Episode 55] - Mean score over last 1 times:67.45280227877446
epoch 55 start, epsilon: 0.059538555105529384 time: 2020-06-29 01:51:34.226462
부족분 점수: 33.809179366547646
추가분 점수: 0
기타 점수: 30.0
[Episode 56] - Mean score over last 1 times: 63.809179366547646
epoch 56 start, epsilon: 0.05656162735025291 time: 2020-06-29 01:51:47.998789
부족분 점수: 27.726468111565815
추가분 점수: 8.088088076402354
기타 점수: 30.0
[Episode 57] - Mean score over last 1 times:65.81455618796817
epoch 57 start, epsilon: 0.053733545982740265 time: 2020-06-29 01:52:00.352467
부족분 점수: 24.763224163562036
추가분 점수: 9.49567184615569
기타 점수: 30.0
[Episode 58] - Mean score over last 1 times:64.25889600971772
epoch 58 start, epsilon: 0.05104686868360325 time: 2020-06-29 01:52:14.992086
부족분 점수: 26.804370272585988
추가분 점수: 12.638527496841094
기타 점수: 30.0
[Episode 59] - Mean score over last 1 times:69.44289776942708
epoch 59 start, epsilon: 0.04849452524942309 time: 2020-06-29 01:52:28.569076
부족분 점수: 24.501350656803528
추가분 점수: 12.517600319254532
기타 점수: 30.0
[Episode 60] - Mean score over last 1 times:67.01895097605805
epoch 60 start, epsilon: 0.04606979898695193 time: 2020-06-29 01:52:42.509083
부족분 점수: 22.061376007923606
추가분 점수: 8.731065843789544
기타 점수: 30.0
[Episode 61] - Mean score over last 1 times:60.79244185171315
epoch 61 start, epsilon: 0.04376630903760433 time: 2020-06-29 01:52:56.616080
부족분 점수: 22.649468538897473
추가분 점수: 7.812023226443074
기타 점수: 30.0
[Episode 62] - Mean score over last 1 times:60.46149176534055
epoch 62 start, epsilon: 0.041577993585724116 time: 2020-06-29 01:53:13.312039
부족분 점수: 37.41923631440427
추가분 점수: 0
기타 점수: 30.0
[Episode 63] - Mean score over last 1 times:67.41923631440427
epoch 63 start, epsilon: 0.03949909390643791 time: 2020-06-29 01:53:26.821039
부족분 점수: 43.150904293377465
추가분 점수: 0
기타 점수: 30.0
[Episode 64] - Mean score over last 1 times:73.15090429337747
epoch 64 start, epsilon: 0.03752413921111601 time: 2020-06-29 01:53:40.013017
```

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부족분 점수: 46.78294685573302
추가분 점수: 0
기타 점수: 30.0
[Episode 65] - Mean score over last 1 times:76.78294685573303
epoch 65 start, epsilon: 0.03564793225056021 time: 2020-06-29 01:53:54.465035
부족분 점수: 36.65439713826038
추가분 점수: 0
기타 점수: 30.0
[Episode 66] - Mean score over last 1 times:66.65439713826038
epoch 66 start, epsilon: 0.0338655356380322 time: 2020-06-29 01:54:09.688055
부족분 점수: 26.212572766961706
추가분 점수: 0
기타 점수: 30.0
[Episode 67] - Mean score over last 1 times:56.212572766961706
epoch 67 start, epsilon: 0.032172258856130585 time: 2020-06-29 01:54:23.663039
부족분 점수: 36.87410428551284
추가분 점수: 0.7001597194295806
기타 점수: 30.0
[Episode 68] - Mean score over last 1 times:67.57426400494242
epoch 68 start, epsilon: 0.030563645913324056 time: 2020-06-29 01:54:38.349017
부족분 점수: 23.947154342915372
추가분 점수: 2.670005035201868
기타 점수: 30.0
[Episode 69] - Mean score over last 1 times:56.617159378117236
epoch 69 start, epsilon: 0.029035463617657853 time: 2020-06-29 01:54:52.406045
부족분 점수: 24.448705301831016
추가분 점수: 5.539394233572539
기타 점수: 30.0
[Episode 70] - Mean score over last 1 times:59.988099535403556
epoch 70 start, epsilon: 0.027583690436774957 time: 2020-06-29 01:55:05.760985
부족분 점수: 21.135487174981403
추가분 점수: 8.356486147972264
기타 점수: 30.0
[Episode 71] - Mean score over last 1 times:59.49197332295367
epoch 71 start, epsilon: 0.02620450591493621 time: 2020-06-29 01:55:20.779009
부족분 점수: 17.36820382153082
추가분 점수: 4.0859234618594975
기타 점수: 30.0
[Episode 72] - Mean score over last 1 times:51.45412728339032
epoch 72 start, epsilon: 0.0248942806191894 time: 2020-06-29 01:55:35.703309
부족분 점수: 16.873780177033886
추가분 점수: 3.7591274938304187
기타 점수: 30.0
[Episode 73] - Mean score over last 1 times:50.632907670864306
epoch 73 start, epsilon: 0.023649566588229927 time: 2020-06-29 01:55:49.378393
부족분 점수: 17.193209819841766
추가분 점수: 3.5104124841056272
기타 점수: 30.0
[Episode 74] - Mean score over last 1 times:50.70362230394739
epoch 74 start, epsilon: 0.022467088258818428 time: 2020-06-29 01:56:04.031034
부족분 점수: 20.123251849492007
```

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추가분 점수: 1.9858891462982675
기타 점수: 30.0
[Episode 75] - Mean score over last 1 times:52.10914099579027
epoch 75 start, epsilon: 0.021343733845877507 time: 2020-06-29 01:56:16.092055
부족분 점수: 16.90339232517266
추가분 점수: 0
기타 점수: 30.0
[Episode 76] - Mean score over last 1 times:46.90339232517266
epoch 76 start, epsilon: 0.02027654715358363 time: 2020-06-29 01:56:30.733456
부족분 점수: 17.50289316739389
추가분 점수: 0
기타 점수: 30.0
[Episode 77] - Mean score over last 1 times: 47.50289316739389
epoch 77 start, epsilon: 0.019262719795904448 time: 2020-06-29 01:56:44.651286
부족분 점수: 17.30899181372641
추가분 점수: 0
기타 점수: 30.0
[Episode 78] - Mean score over last 1 times:47.30899181372641
epoch 78 start, epsilon: 0.018299583806109226 time: 2020-06-29 01:56:57.659311
부족분 점수: 16.95004551343238
추가분 점수: 0
기타 점수: 30.0
[Episode 79] - Mean score over last 1 times:46.95004551343238
epoch 79 start, epsilon: 0.017384604615803764 time: 2020-06-29 01:57:12.289301
부족분 점수: 22.064933520896396
추가분 점수: 0.9412786094855341
기타 점수: 30.0
[Episode 80] - Mean score over last 1 times:53.006212130381925
epoch 80 start. epsilon: 0.016515374385013576 time: 2020-06-29 01:57:26.956278
부족분 점수: 17.420099579642056
추가분 점수: 1.6732574868290606
기타 점수: 30.0
[Episode 81] - Mean score over last 1 times:49.093357066471114
epoch 81 start, epsilon: 0.015689605665762895 time: 2020-06-29 01:57:40.361283
부족분 점수: 26.11284873534715
추가분 점수: 1.7043006276644856
기타 점수: 30.0
[Episode 82] - Mean score over last 1 times:57.81714936301164
epoch 82 start, epsilon: 0.01490512538247475 time: 2020-06-29 01:57:54.203245
부족분 점수: 20.836308935901172
추가분 점수: 0.4948457535491424
기타 점수: 30.0
[Episode 83] - Mean score over last 1 times:51.331154689450315
epoch 83 start, epsilon: 0.014159869113351011 time: 2020-06-29 01:58:07.861263
부족분 점수: 23.974574534658565
추가분 점수: 0
기타 점수: 30.0
[Episode 84] - Mean score over last 1 times:53.974574534658565
epoch 84 start, epsilon: 0.01345187565768346 time: 2020-06-29 01:58:21.632227
부족분 점수: 22.745118941667542
```

추가분 점수: 0

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2020. 6. 29.
                                             Untitled - Jupyter Notebook
  추가분 점수: 0
  기타 점수: 30.0
  [Episode 85] - Mean score over last 1 times:52.74511894166754
  epoch 85 start, epsilon: 0.012779281874799287 time: 2020-06-29 01:58:35.027245
  부족분 점수: 20.520174139952807
  추가분 점수: 0
  기타 점수: 30.0
  [Episode 86] - Mean score over last 1 times:50.52017413995281
  epoch 86 start, epsilon: 0.012140317781059323 time: 2020-06-29 01:58:49.502247
  부족분 점수: 19.582732606203894
  추가분 점수: 0
  기타 점수: 30.0
  [Episode 87] - Mean score over last 1 times:49.58273260620389
  epoch 87 start, epsilon: 0.011533301892006355 time: 2020-06-29 01:59:03.223222
  부족분 점수: 22.098084749298252
  추가분 점수: 0
  기타 점수: 30.0
  [Episode 88] - Mean score over last 1 times:52.09808474929825
  epoch 88 start, epsilon: 0.010956636797406038 time: 2020-06-29 01:59:17.076493
  부족분 점수: 21.52515004993728
  추가분 점수: 0
  기타 점수: 30.0
  [Episode 89] - Mean score over last 1 times:51.52515004993728
  epoch 89 start, epsilon: 0.010408804957535735 time: 2020-06-29 01:59:30.570211
  부족분 점수: 20.4912378578365
  추가분 점수: 0
  기타 점수: 30.0
  [Episode 90] - Mean score over last 1 times:50.491237857836495
  epoch 90 start, epsilon: 0.009888364709658948 time: 2020-06-29 01:59:45.169205
  부족분 점수: 27.014630656115372
  추가분 점수: 5.51152643419538
  기타 점수: 30.0
  [Episode 91] - Mean score over last 1 times:62.526157090310754
  epoch 91 start, epsilon: 0.009393946474176 time: 2020-06-29 01:59:59.505533
  부족분 점수: 19.957143949939216
  추가분 점수: 0.8585182006111669
  기타 점수: 30.0
  [Episode 92] - Mean score over last 1 times:50.81566215055038
  epoch 92 start, epsilon: 0.0089242491504672 time: 2020-06-29 02:00:13.728437
  부족분 점수: 22.32476560505523
  추가분 점수: 3.171983018558975
  기타 점수: 30.0
  [Episode 93] - Mean score over last 1 times:55.49674862361421
  epoch 93 start, epsilon: 0.008478036692943839 time: 2020-06-29 02:00:30.638712
  부족분 점수: 23.634463391563287
  추가분 점수: 0
  기타 점수: 30.0
  [Episode 94] - Mean score over last 1 times:53.63446339156329
  epoch 94 start, epsilon: 0.008054134858296647 time: 2020-06-29 02:00:45.743361
  부족분 점수: 22.69352425114813
```

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2020. 6. 29.
                                             Untitled - Jupyter Notebook
  기타 점수: 30.0
  [Episode 95] - Mean score over last 1 times:52.69352425114813
  epoch 95 start, epsilon: 0.0076514281153818135 time: 2020-06-29 02:01:02.556356
  부족분 점수: 25.838086156328423
  추가분 점수: 0
  기타 점수: 30.0
  [Episode 96] - Mean score over last 1 times:55.83808615632842
  epoch 96 start, epsilon: 0.0072688567096127225 time: 2020-06-29 02:01:20.209325
  부족분 점수: 31.473374104439124
  추가분 점수: 0
  기타 점수: 30.0
  [Episode 97] - Mean score over last 1 times:61.473374104439124
  epoch 97 start, epsilon: 0.006905413874132086 time: 2020-06-29 02:01:37.266334
  부족분 점수: 32.020913138006
  추가분 점수: 0
  기타 점수: 30.0
  [Episode 98] - Mean score over last 1 times:62.020913138006
  epoch 98 start, epsilon: 0.006560143180425482 time: 2020-06-29 02:01:52.117357
  부족분 점수: 31.286807433174513
  추가분 점수: 0
  기타 점수: 30.0
  [Episode 99] - Mean score over last 1 times:61.286807433174516
  epoch 99 start, epsilon: 0.0062321360214042075 time: 2020-06-29 02:02:09.423305
  부족분 점수: 28.63470762496686
  추가분 점수: 0
  기타 점수: 30.0
  [Episode 100] - Mean score over last 1 times:58.634707624966865
  epoch 100 start, epsilon: 0.005920529220333997 time: 2020-06-29 02:02:27.161323
  부족분 점수: 25.109110889031093
  추가분 점수: 0
  기타 점수: 30.0
  [Episode 101] - Mean score over last 1 times:55.10911088903109
  epoch 101 start, epsilon: 0.0056245027593172965 time: 2020-06-29 02:02:43.071267
  부족분 점수: 22.827829582225707
  추가분 점수: 0
  기타 점수: 30.0
  [Episode 102] - Mean score over last 1 times:52.827829582225704
  epoch 102 start, epsilon: 0.005343277621351432 time: 2020-06-29 02:02:57.761063
  부족분 점수: 27.370985624636912
  추가분 점수: 2.8036470959419457
  기타 점수: 30.0
  [Episode 103] - Mean score over last 1 times:60.174632720578856
  epoch 103 start, epsilon: 0.0050761137402838595 time: 2020-06-29 02:03:12.018935
  부족분 점수: 16.629628184596214
  추가분 점수: 6.484156625192046
  기타 점수: 30.0
  [Episode 104] - Mean score over last 1 times:53.11378480978826
  epoch 104 start, epsilon: 0.004822308053269666 time: 2020-06-29 02:03:25.007202
  부족분 점수: 17.429597033316817
  추가분 점수: 8.729559891406762
```

기타 점수: 30.0

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[Episode 105] - Mean score over last 1 times:56.159156924723575
epoch 105 start, epsilon: 0.004581192650606183 time: 2020-06-29 02:03:41.270753
부족분 점수: 17.767889482388004
추가분 점수: 7.74970592147727
기타 점수: 30.0
[Episode 106] - Mean score over last 1 times:55.51759540386527
epoch 106 start, epsilon: 0.0043521330180758735 time: 2020-06-29 02:03:53.118072
부족분 점수: 18.714633390300644
추가분 점수: 6.1778111341554105
기타 점수: 30.0
[Episode 107] - Mean score over last 1 times:54.89244452445605
epoch 107 start, epsilon: 0.0041345263671720795 time: 2020-06-29 02:04:05.526888
부족분 점수: 25.503133099831864
추가분 점수: 6.0469450394966895
기타 점수: 30.0
[Episode 108] - Mean score over last 1 times:61.550078139328555
epoch 108 start, epsilon: 0.003927800048813475 time: 2020-06-29 02:04:18.145146
부족분 점수: 30.94535991862573
추가분 점수: 0
기타 점수: 30.0
[Episode 109] - Mean score over last 1 times:60.945359918625726
epoch 109 start, epsilon: 0.0037314100463728015 time: 2020-06-29 02:04:31.521374
부족분 점수: 27.28311382536175
추가분 점수: 0
기타 점수: 30.0
[Episode 110] - Mean score over last 1 times:57.28311382536175
epoch 110 start, epsilon: 0.0035448395440541612 time: 2020-06-29 02:04:44.264297
부족분 점수: 15.614657137774978
추가분 점수: 0
기타 점수: 30.0
[Episode 111] - Mean score over last 1 times:45.61465713777498
epoch 111 start, epsilon: 0.003367597566851453 time: 2020-06-29 02:04:57.981615
부족분 점수: 15.641937548136253
추가분 점수: 0
기타 점수: 30.0
[Episode 112] - Mean score over last 1 times:45.641937548136255
epoch 112 start, epsilon: 0.00319921768850888 time: 2020-06-29 02:05:12.671332
부족분 점수: 17.13821583044119
추가분 점수: 0
기타 점수: 30.0
[Episode 113] - Mean score over last 1 times:47.13821583044119
epoch 113 start, epsilon: 0.003039256804083436 time: 2020-06-29 02:05:25.477088
부족분 점수: 16.191984966281964
추가분 점수: 0
기타 점수: 30.0
[Episode 114] - Mean score over last 1 times:46.191984966281964
epoch 114 start, epsilon: 0.0028872939638792637 time: 2020-06-29 02:05:38.533173
부족분 점수: 16.3393345115931
추가분 점수: 0
기타 점수: 30.0
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[Episode 115] - Mean score over last 1 times:46.3393345115931

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epoch 115 start, epsilon: 0.0027429292656853004 time: 2020-06-29 02:05:51.739372
부족분 점수: 15.735477405645264
추가분 점수: 0
기타 점수: 30.0
[Episode 116] - Mean score over last 1 times:45.73547740564526
epoch 116 start, epsilon: 0.0026057828024010354 time: 2020-06-29 02:06:07.094504
부족분 점수: 15.618256124344605
추가분 점수: 0
기타 점수: 30.0
[Episode 117] - Mean score over last 1 times:45.618256124344605
epoch 117 start, epsilon: 0.0024754936622809836 time: 2020-06-29 02:06:20.958508
부족분 점수: 14.239638436254925
추가분 점수: 0
기타 점수: 30.0
[Episode 118] - Mean score over last 1 times:44.23963843625492
epoch 118 start, epsilon: 0.002351718979166934 time: 2020-06-29 02:06:34.313498
부족분 점수: 26.089594335996964
추가분 점수: 0.24734361612284594
기타 점수: 30.0
[Episode 119] - Mean score over last 1 times:56.33693795211981
epoch 119 start, epsilon: 0.0022341330302085875 time: 2020-06-29 02:06:50.070332
부족분 점수: 12.667637046428615
추가분 점수: 0
기타 점수: 30.0
[Episode 120] - Mean score over last 1 times: 42.66763704642862
epoch 120 start, epsilon: 0.002122426378698158 time: 2020-06-29 02:07:04.731791
부족분 점수: 12.621690445374206
추가분 점수: 1.78728530117358
기타 점수: 30.0
[Episode 121] - Mean score over last 1 times:44.40897574654778
epoch 121 start, epsilon: 0.0020163050597632503 time: 2020-06-29 02:07:22.550489
부족분 점수: 12.621690445374206
추가분 점수: 1.3708535235507058
기타 점수: 30.0
[Episode 122] - Mean score over last 1 times:43.99254396892491
epoch 122 start, epsilon: 0.0019154898067750877 time: 2020-06-29 02:07:36.358470
부족분 점수: 12.758272216100174
추가분 점수: 5.845854621832991
기타 점수: 30.0
[Episode 123] - Mean score over last 1 times:48.604126837933165
epoch 123 start, epsilon: 0.0018197153164363333 time: 2020-06-29 02:07:52.032457
부족분 점수: 13.056708538614837
추가분 점수: 5.854260551881472
기타 점수: 30.0
[Episode 124] - Mean score over last 1 times:48.91096909049631
epoch 124 start, epsilon: 0.0017287295506145165 time: 2020-06-29 02:08:06.793489
부족분 점수: 23.874317490521747
추가분 점수: 4.676465699952965
기타 점수: 30.0
[Episode 125] - Mean score over last 1 times:58.55078319047471
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epoch 125 start, epsilon: 0.0016422930730837905 time: 2020-06-29 02:08:22.090467
부족분 점수: 23.865331544541263
추가분 점수: 4.349203384368385
기타 점수: 30.0
[Episode 126] - Mean score over last 1 times:58.21453492890965
epoch 126 start, epsilon: 0.0015601784194296008 time: 2020-06-29 02:08:37.586461
부족분 점수: 24.26786966722507
추가분 점수: 4.181415957749772
기타 점수: 30.0
[Episode 127] - Mean score over last 1 times:58.44928562497484
epoch 127 start, epsilon: 0.0014821694984581207 time: 2020-06-29 02:08:52.546475
부족분 점수: 23.424608527647372
추가분 점수: 5.343549765090476
기타 점수: 30.0
[Episode 128] - Mean score over last 1 times:58.76815829273785
epoch 128 start, epsilon: 0.0014080610235352145 time: 2020-06-29 02:09:06.515503
부족분 점수: 23.424608527647372
추가분 점수: 5.343549765090476
기타 점수: 30.0
[Episode 129] - Mean score over last 1 times:58.76815829273785
epoch 129 start, epsilon: 0.0013376579723584536 time: 2020-06-29 02:09:21.842705
부족분 점수: 23.424608527647372
추가분 점수: 5.343549765090476
기타 점수: 30.0
[Episode 130] - Mean score over last 1 times:58.76815829273785
epoch 130 start, epsilon: 0.0012707750737405309 time: 2020-06-29 02:09:39.560711
부족분 점수: 23.25274194237136
추가분 점수: 5.50243787946421
기타 점수: 30.0
[Episode 131] - Mean score over last 1 times:58.75517982183557
epoch 131 start, epsilon: 0.0012072363200535043 time: 2020-06-29 02:09:56.144736
부족분 점수: 23.25274194237136
추가분 점수: 5.50243787946421
기타 점수: 30.0
[Episode 132] - Mean score over last 1 times:58.75517982183557
epoch 132 start, epsilon: 0.001146874504050829 time: 2020-06-29 02:10:10.378809
부족분 점수: 23.02085845430055
추가분 점수: 5.50243787946421
기타 점수: 30.0
[Episode 133] - Mean score over last 1 times:58.52329633376476
epoch 133 start, epsilon: 0.0010895307788482875 time: 2020-06-29 02:10:27.666702
부족분 점수: 21.417181988907807
추가분 점수: 3.9299839666146763
기타 점수: 30.0
[Episode 134] - Mean score over last 1 times:55.347165955522485
epoch 134 start, epsilon: 0.001035054239905873 time: 2020-06-29 02:10:41.940677
부족분 점수: 21.954352623266445
추가분 점수: 0
기타 점수: 30.0
[Episode 135] - Mean score over last 1 times:51.954352623266445
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epoch 135 start, epsilon: 0.001 time: 2020-06-29 02:10:56.070695
부족분 점수: 26.583480359794205
추가분 점수: 0
기타 점수: 30.0
[Episode 136] - Mean score over last 1 times: 56.58348035979421
epoch 136 start, epsilon: 0.001 time: 2020-06-29 02:11:12.000649
부족분 점수: 26.57764947929131
추가분 점수: 0
기타 점수: 30.0
[Episode 137] - Mean score over last 1 times:56.57764947929131
epoch 137 start, epsilon: 0.001 time: 2020-06-29 02:11:26.809502
부족분 점수: 25.937670406561065
추가분 점수: 0
기타 점수: 30.0
[Episode 138] - Mean score over last 1 times:55.93767040656107
epoch 138 start, epsilon: 0.001 time: 2020-06-29 02:11:41.444662
부족분 점수: 26.901602816272273
추가분 점수: 0
기타 점수: 30.0
[Episode 139] - Mean score over last 1 times:56.90160281627227
epoch 139 start, epsilon: 0.001 time: 2020-06-29 02:11:55.014051
부족분 점수: 26.94096279572594
추가분 점수: 0
기타 점수: 30.0
[Episode 140] - Mean score over last 1 times:56.94096279572594
epoch 140 start, epsilon: 0.001 time: 2020-06-29 02:12:11.150214
부족분 점수: 30.39054764502165
추가분 점수: 0
기타 점수: 30.0
[Episode 141] - Mean score over last 1 times:60.39054764502165
epoch 141 start, epsilon: 0.001 time: 2020-06-29 02:12:30.294218
부족분 점수: 30.043909786632174
추가분 점수: 0
기타 점수: 30.0
[Episode 142] - Mean score over last 1 times:60.04390978663217
epoch 142 start, epsilon: 0.001 time: 2020-06-29 02:12:45.818149
부족분 점수: 30.05072988922248
추가분 점수: 0
기타 점수: 30.0
[Episode 143] - Mean score over last 1 times:60.05072988922248
epoch 143 start, epsilon: 0.001 time: 2020-06-29 02:12:59.397233
부족분 점수: 27.892187388155694
추가분 점수: 0
기타 점수: 30.0
[Episode 144] - Mean score over last 1 times:57.89218738815569
epoch 144 start, epsilon: 0.001 time: 2020-06-29 02:13:14.013263
부족분 점수: 28.516057808664176
추가분 점수: 0
기타 점수: 30.0
[Episode 145] - Mean score over last 1 times:58.51605780866417
epoch 145 start, epsilon: 0.001 time: 2020-06-29 02:13:31.964214
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부족분 점수: 28.390423531442977
추가분 점수: 0
기타 점수: 30.0
[Episode 146] - Mean score over last 1 times:58.39042353144298
epoch 146 start, epsilon: 0.001 time: 2020-06-29 02:13:47.701153
부족분 점수: 26.587543236224697
추가분 점수: 0
기타 점수: 30.0
[Episode 147] - Mean score over last 1 times:56.5875432362247
epoch 147 start, epsilon: 0.001 time: 2020-06-29 02:14:04.473057
부족분 점수: 27.709995413327405
추가분 점수: 0
기타 점수: 30.0
[Episode 148] - Mean score over last 1 times:57.709995413327405
epoch 148 start, epsilon: 0.001 time: 2020-06-29 02:14:19.834142
부족분 점수: 31.658632053314772
추가분 점수: 0
기타 점수: 30.0
[Episode 149] - Mean score over last 1 times:61.658632053314776
epoch 149 start, epsilon: 0.001 time: 2020-06-29 02:14:35.632039
부족분 점수: 32.229585236382604
추가분 점수: 0
기타 점수: 30.0
[Episode 150] - Mean score over last 1 times:62.229585236382604
epoch 150 start, epsilon: 0.001 time: 2020-06-29 02:14:49.961214
부족분 점수: 32.16725042034258
추가분 점수: 0
기타 점수: 30.0
[Episode 151] - Mean score over last 1 times:62.16725042034258
epoch 151 start, epsilon: 0.001 time: 2020-06-29 02:15:04.623157
부족분 점수: 31.217979695141416
추가분 점수: 0
기타 점수: 30.0
[Episode 152] - Mean score over last 1 times:61.217979695141416
epoch 152 start, epsilon: 0.001 time: 2020-06-29 02:15:20.316833
부족분 점수: 31.675682309790567
추가분 점수: 0
기타 점수: 30.0
[Episode 153] - Mean score over last 1 times:61.67568230979057
epoch 153 start, epsilon: 0.001 time: 2020-06-29 02:15:34.666911
부족분 점수: 32.52223676016863
추가분 점수: 0
기타 점수: 30.0
[Episode 154] - Mean score over last 1 times:62.52223676016863
epoch 154 start, epsilon: 0.001 time: 2020-06-29 02:15:49.373833
부족분 점수: 30.98253715803867
추가분 점수: 0
기타 점수: 30.0
[Episode 155] - Mean score over last 1 times:60.98253715803867
epoch 155 start, epsilon: 0.001 time: 2020-06-29 02:16:04.276799
부족분 점수: 31.37862383232624
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 추가분 점수: 0
 기타 점수: 30.0
 기타 점수: 30.0
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[Episode 156] - Mean score over last 1 times:61.37862383232624

epoch 156 start, epsilon: 0.001 time: 2020-06-29 02:16:18.317322

부족분 점수: 27.9947500570646 추가분 점수: 1.6464673865459045

[Episode 157] - Mean score over last 1 times:59.6412174436105

epoch 157 start, epsilon: 0.001 time: 2020-06-29 02:16:32.179795

부족분 점수: 25.766137146118854 추가분 점수: 2.986224314403043

기타 점수: 30.0

[Episode 158] - Mean score over last 1 times:58.7523614605219

epoch 158 start, epsilon: 0.001 time: 2020-06-29 02:16:47.871846

부족분 점수: 24.894807597840057 추가분 점수: 3.1204906295784163

기타 점수: 30.0

[Episode 159] - Mean score over last 1 times:58.01529822741847

epoch 159 start, epsilon: 0.001 time: 2020-06-29 02:17:02.536763

부족분 점수: 23.867351462312943 추가분 점수: 3.1343053310775804

기타 점수: 30.0

[Episode 160] - Mean score over last 1 times:57.001656793390524

epoch 160 start, epsilon: 0.001 time: 2020-06-29 02:17:17.492054

부족분 점수: 22.014387958770943 추가분 점수: 3.0135415901837215

기타 점수: 30.0

[Episode 161] - Mean score over last 1 times:55.02792954895466

epoch 161 start, epsilon: 0.001 time: 2020-06-29 02:17:33.035624

부족분 점수: 23.146477370930324 추가분 점수: 3.1928697363477365

기타 점수: 30.0

[Episode 162] - Mean score over last 1 times:56.33934710727806

epoch 162 start, epsilon: 0.001 time: 2020-06-29 02:17:49.850786

부족분 점수: 25.72880169261429 추가분 점수: 3.670272002280741

기타 점수: 30.0

[Episode 163] - Mean score over last 1 times:59.39907369489503

epoch 163 start, epsilon: 0.001 time: 2020-06-29 02:18:06.783782

부족분 점수: 20.064090531639284 추가분 점수: 3.4956288364997135

기타 점수: 30.0

[Episode 164] - Mean score over last 1 times:53.559719368139

epoch 164 start, epsilon: 0.001 time: 2020-06-29 02:18:22.062738

부족분 점수: 16.29022670082453 추가분 점수: 5.800263157652202

기타 점수: 30.0

[Episode 165] - Mean score over last 1 times:52.09048985847673

epoch 165 start, epsilon: 0.001 time: 2020-06-29 02:18:39.150751

부족분 점수: 21.437229096769578

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추가분 점수: 3.116064935978591
기타 점수: 30.0
[Episode 166] - Mean score over last 1 times:54.55329403274817
epoch 166 start, epsilon: 0.001 time: 2020-06-29 02:18:56.416633
부족분 점수: 21.076944888962895
추가분 점수: 3.362082011426437
기타 점수: 30.0
[Episode 167] - Mean score over last 1 times:54.43902690038934
epoch 167 start, epsilon: 0.001 time: 2020-06-29 02:19:11.141145
부족분 점수: 18.667894182728983
추가분 점수: 5.269949798515123
기타 점수: 30.0
[Episode 168] - Mean score over last 1 times:53.93784398124411
epoch 168 start, epsilon: 0.001 time: 2020-06-29 02:19:25.882125
부족분 점수: 27.635812973125418
추가분 점수: 0
기타 점수: 30.0
[Episode 169] - Mean score over last 1 times:57.63581297312542
epoch 169 start, epsilon: 0.001 time: 2020-06-29 02:19:41.765986
부족분 점수: 27.816014215305724
추가분 점수: 0
기타 점수: 30.0
[Episode 170] - Mean score over last 1 times:57.81601421530573
epoch 170 start, epsilon: 0.001 time: 2020-06-29 02:19:58.226925
부족분 점수: 24.97479326948038
추가분 점수: 0
기타 점수: 30.0
[Episode 171] - Mean score over last 1 times:54.97479326948038
epoch 171 start, epsilon: 0.001 time: 2020-06-29 02:20:09.914879
부족분 점수: 18.289269428767252
추가분 점수: 0
기타 점수: 30.0
[Episode 172] - Mean score over last 1 times:48.289269428767255
epoch 172 start, epsilon: 0.001 time: 2020-06-29 02:20:22.403150
부족분 점수: 18.289269428767252
추가분 점수: 0
기타 점수: 30.0
[Episode 173] - Mean score over last 1 times:48.289269428767255
epoch 173 start, epsilon: 0.001 time: 2020-06-29 02:20:36.581367
부족분 점수: 33.485935688890265
추가분 점수: 0
기타 점수: 30.0
[Episode 174] - Mean score over last 1 times:63.485935688890265
epoch 174 start, epsilon: 0.001 time: 2020-06-29 02:20:51.857459
부족분 점수: 33.528091295982314
추가분 점수: 0.27678249679040423
기타 점수: 30.0
[Episode 175] - Mean score over last 1 times:63.80487379277272
epoch 175 start, epsilon: 0.001 time: 2020-06-29 02:21:04.886406
부족분 점수: 33.129901756729396
추가분 점수: 5.966591328085951
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기타 점수: 30.0
[Episode 176] - Mean score over last 1 times:69.09649308481535
epoch 176 start, epsilon: 0.001 time: 2020-06-29 02:21:19.068548
부족분 점수: 24.983124854266386
추가분 점수: 4.141086417765692
기타 점수: 30.0
[Episode 177] - Mean score over last 1 times:59.12421127203208
epoch 177 start, epsilon: 0.001 time: 2020-06-29 02:21:33.233420
부족분 점수: 22.582855798147083
추가분 점수: 3.9298727559327973
기타 점수: 30.0
[Episode 178] - Mean score over last 1 times:56.512728554079885
epoch 178 start, epsilon: 0.001 time: 2020-06-29 02:21:47.838394
부족분 점수: 22.55921277583398
추가분 점수: 3.946260663706578
기타 점수: 30.0
[Episode 179] - Mean score over last 1 times:56.50547343954056
epoch 179 start. epsilon: 0.001 time: 2020-06-29 02:22:01.414406
부족분 점수: 19.65443891906904
추가분 점수: 3.182894568279826
기타 점수: 30.0
[Episode 180] - Mean score over last 1 times:52.837333487348864
epoch 180 start, epsilon: 0.001 time: 2020-06-29 02:22:17.196708
부족분 점수: 12.363297648631388
추가분 점수: 3.035177290410107
기타 점수: 30.0
[Episode 181] - Mean score over last 1 times:45.39847493904149
epoch 181 start, epsilon: 0.001 time: 2020-06-29 02:22:30.523489
부족분 점수: 12.20188855399386
추가분 점수: 1.7204900765971254
기타 점수: 30.0
[Episode 182] - Mean score over last 1 times:43.922378630590984
epoch 182 start, epsilon: 0.001 time: 2020-06-29 02:22:43.905371
부족분 점수: 12.20188855399386
추가분 점수: 0
기타 점수: 30.0
[Episode 183] - Mean score over last 1 times:42.20188855399386
epoch 183 start, epsilon: 0.001 time: 2020-06-29 02:22:58.126764
부족분 점수: 12.20188855399386
추가분 점수: 0
기타 점수: 30.0
[Episode 184] - Mean score over last 1 times:42.20188855399386
epoch 184 start, epsilon: 0.001 time: 2020-06-29 02:23:12.301397
부족분 점수: 12.20188855399386
추가분 점수: 0
기타 점수: 30.0
[Episode 185] - Mean score over last 1 times:42.20188855399386
epoch 185 start, epsilon: 0.001 time: 2020-06-29 02:23:27.051368
부족분 점수: 12.255085354198341
추가분 점수: 0
기타 점수: 30.0
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[Episode 186] - Mean score over last 1 times:42.25508535419834
epoch 186 start, epsilon: 0.001 time: 2020-06-29 02:23:41.478371
부족분 점수: 12.177336184668718
추가분 점수: 0
기타 점수: 30.0
[Episode 187] - Mean score over last 1 times:42.17733618466872
epoch 187 start, epsilon: 0.001 time: 2020-06-29 02:23:56.719210
부족분 점수: 12.177336184668718
추가분 점수: 0
기타 점수: 30.0
[Episode 188] - Mean score over last 1 times:42.17733618466872
epoch 188 start, epsilon: 0.001 time: 2020-06-29 02:24:13.438609
부족분 점수: 11.62763591588909
추가분 점수: 0
기타 점수: 30.0
[Episode 189] - Mean score over last 1 times:41.62763591588909
epoch 189 start, epsilon: 0.001 time: 2020-06-29 02:24:27.588769
부족분 점수: 17.2945728265608
추가분 점수: 0
기타 점수: 30.0
[Episode 190] - Mean score over last 1 times: 47.294572826560795
epoch 190 start, epsilon: 0.001 time: 2020-06-29 02:24:39.924787
부족분 점수: 15.395585919007287
추가분 점수: 0
기타 점수: 30.0
[Episode 191] - Mean score over last 1 times:45.39558591900729
epoch 191 start, epsilon: 0.001 time: 2020-06-29 02:24:53.075911
부족분 점수: 24.34375866913378
추가분 점수: 0
기타 점수: 30.0
[Episode 192] - Mean score over last 1 times:54.34375866913378
epoch 192 start, epsilon: 0.001 time: 2020-06-29 02:25:05.707132
부족분 점수: 24.505167763771308
추가분 점수: 0
기타 점수: 30.0
[Episode 193] - Mean score over last 1 times:54.50516776377131
epoch 193 start, epsilon: 0.001 time: 2020-06-29 02:25:18.094550
부족분 점수: 23.59641520661685
추가분 점수: 0
기타 점수: 30.0
[Episode 194] - Mean score over last 1 times:53.596415206616854
epoch 194 start, epsilon: 0.001 time: 2020-06-29 02:25:30.626433
부족분 점수: 12.050179672837835
추가분 점수: 0
기타 점수: 30.0
[Episode 195] - Mean score over last 1 times:42.050179672837835
epoch 195 start, epsilon: 0.001 time: 2020-06-29 02:25:47.098857
부족분 점수: 23.21428823781145
추가분 점수: 0
기타 점수: 30.0
[Episode 196] - Mean score over last 1 times:53.214288237811445
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epoch 196 start, epsilon: 0.001 time: 2020-06-29 02:25:59.827864
부족분 점수: 23.177783792302687
추가분 점수: 0
기타 점수: 30.0
[Episode 197] - Mean score over last 1 times:53.17778379230269
epoch 197 start, epsilon: 0.001 time: 2020-06-29 02:26:14.197135
부족분 점수: 23.177783792302687
추가분 점수: 0
기타 점수: 30.0
[Episode 198] - Mean score over last 1 times:53.17778379230269
epoch 198 start, epsilon: 0.001 time: 2020-06-29 02:26:26.347858
부족분 점수: 23.177783792302687
추가분 점수: 0
기타 점수: 30.0
[Episode 199] - Mean score over last 1 times:53.17778379230269
epoch 199 start, epsilon: 0.001 time: 2020-06-29 02:26:38.685751
부족분 점수: 23.22263671924802
추가분 점수: 0
기타 점수: 30.0
[Episode 200] - Mean score over last 1 times:53.222636719248015
epoch 200 start, epsilon: 0.001 time: 2020-06-29 02:26:51.984798
부족분 점수: 21.47145249445252
추가분 점수: 0
기타 점수: 30.0
[Episode 201] - Mean score over last 1 times:51.47145249445252
epoch 201 start, epsilon: 0.001 time: 2020-06-29 02:27:05.064819
부족분 점수: 21.683210535645326
추가분 점수: 0
기타 점수: 30.0
[Episode 202] - Mean score over last 1 times:51.68321053564533
epoch 202 start, epsilon: 0.001 time: 2020-06-29 02:27:20.136047
부족분 점수: 21.683210535645326
추가분 점수: 0
기타 점수: 30.0
[Episode 203] - Mean score over last 1 times:51.68321053564533
epoch 203 start, epsilon: 0.001 time: 2020-06-29 02:27:33.367226
부족분 점수: 24.58822094551813
추가분 점수: 0
기타 점수: 30.0
[Episode 204] - Mean score over last 1 times:54.58822094551813
epoch 204 start, epsilon: 0.001 time: 2020-06-29 02:27:47.727822
부족분 점수: 23.806231669054213
추가분 점수: 0
기타 점수: 30.0
[Episode 205] - Mean score over last 1 times:53.80623166905421
epoch 205 start, epsilon: 0.001 time: 2020-06-29 02:28:02.494795
부족분 점수: 21.972880568636803
추가분 점수: 0
기타 점수: 30.0
[Episode 206] - Mean score over last 1 times:51.9728805686368
```

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epoch 206 start, epsilon: 0.001 time: 2020-06-29 02:28:14.825964
부족분 점수: 20.022285146031603
추가분 점수: 0
기타 점수: 30.0
[Episode 207] - Mean score over last 1 times:50.02228514603161
epoch 207 start, epsilon: 0.001 time: 2020-06-29 02:28:27.870765
부족분 점수: 20.022285146031603
추가분 점수: 0
기타 점수: 30.0
[Episode 208] - Mean score over last 1 times:50.02228514603161
epoch 208 start, epsilon: 0.001 time: 2020-06-29 02:28:40.331787
부족분 점수: 19.984590254687824
추가분 점수: 0
기타 점수: 30.0
[Episode 209] - Mean score over last 1 times:49.984590254687824
epoch 209 start, epsilon: 0.001 time: 2020-06-29 02:28:53.982450
부족분 점수: 24.191154265497993
추가분 점수: 0
기타 점수: 30.0
[Episode 210] - Mean score over last 1 times:54.19115426549799
epoch 210 start, epsilon: 0.001 time: 2020-06-29 02:29:07.911847
부족분 점수: 23.08625617226965
추가분 점수: 0
기타 점수: 30.0
[Episode 211] - Mean score over last 1 times:53.08625617226965
epoch 211 start, epsilon: 0.001 time: 2020-06-29 02:29:20.937871
부족분 점수: 22.876627109047604
추가분 점수: 0
기타 점수: 30.0
[Episode 212] - Mean score over last 1 times:52.876627109047604
epoch 212 start, epsilon: 0.001 time: 2020-06-29 02:29:36.997793
부족분 점수: 22.371037850647742
추가분 점수: 0
기타 점수: 30.0
[Episode 213] - Mean score over last 1 times:52.37103785064774
epoch 213 start, epsilon: 0.001 time: 2020-06-29 02:29:51.277844
부족분 점수: 23.701924036960044
추가분 점수: 0
기타 점수: 30.0
[Episode 214] - Mean score over last 1 times:53.701924036960044
epoch 214 start, epsilon: 0.001 time: 2020-06-29 02:30:06.109839
부족분 점수: 22.75670389971623
추가분 점수: 0
기타 점수: 30.0
[Episode 215] - Mean score over last 1 times:52.75670389971623
epoch 215 start, epsilon: 0.001 time: 2020-06-29 02:30:19.726820
부족분 점수: 21.4028106195756
추가분 점수: 0.12800779580735666
기타 점수: 30.0
[Episode 216] - Mean score over last 1 times:51.53081841538295
```

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epoch 216 start, epsilon: 0.001 time: 2020-06-29 02:30:32.154843
부족분 점수: 20.914528139528237
추가분 점수: 0.23532057400686757
기타 점수: 30.0
[Episode 217] - Mean score over last 1 times:51.14984871353511
epoch 217 start, epsilon: 0.001 time: 2020-06-29 02:30:46.072808
부족분 점수: 20.618397441785664
추가분 점수: 0.9865100214034483
기타 점수: 30.0
[Episode 218] - Mean score over last 1 times:51.60490746318911
epoch 218 start, epsilon: 0.001 time: 2020-06-29 02:30:58.696804
부족분 점수: 20.569237405006263
추가분 점수: 1.6468827369378913
기타 점수: 30.0
[Episode 219] - Mean score over last 1 times:52.21612014194415
epoch 219 start, epsilon: 0.001 time: 2020-06-29 02:31:10.847806
부족분 점수: 21.45414110792259
추가분 점수: 2.82735709043364
기타 점수: 30.0
[Episode 220] - Mean score over last 1 times:54.28149819835623
epoch 220 start, epsilon: 0.001 time: 2020-06-29 02:31:22.616771
부족분 점수: 24.800541184356895
추가분 점수: 7.261120530567116
기타 점수: 30.0
[Episode 221] - Mean score over last 1 times:62.061661714924014
epoch 221 start, epsilon: 0.001 time: 2020-06-29 02:31:35.343805
부족분 점수: 24.867121667865305
추가분 점수: 7.223434241154527
기타 점수: 30.0
[Episode 222] - Mean score over last 1 times:62.090555909019834
epoch 222 start, epsilon: 0.001 time: 2020-06-29 02:31:49.682782
부족분 점수: 24.83984125750403
추가분 점수: 7.28121955722788
기타 점수: 30.0
[Episode 223] - Mean score over last 1 times:62.12106081473191
epoch 223 start, epsilon: 0.001 time: 2020-06-29 02:32:03.853813
부족분 점수: 24.834907435540043
추가분 점수: 7.275473467189624
기타 점수: 30.0
[Episode 224] - Mean score over last 1 times:62.110380902729666
epoch 224 start, epsilon: 0.001 time: 2020-06-29 02:32:16.570804
부족분 점수: 24.859576545359978
추가분 점수: 7.255550780118356
기타 점수: 30.0
[Episode 225] - Mean score over last 1 times:62.11512732547833
epoch 225 start, epsilon: 0.001 time: 2020-06-29 02:32:31.247248
부족분 점수: 24.857782428282167
추가분 점수: 6.677717280941837
기타 점수: 30.0
[Episode 226] - Mean score over last 1 times:61.535499709224005
epoch 226 start, epsilon: 0.001 time: 2020-06-29 02:32:47.036180
```

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2020. 6. 29.
                                             Untitled - Jupyter Notebook
  부족분 점수: 26.090125812460087
  추가분 점수: 5.870464746981874
  기타 점수: 30.0
  [Episode 227] - Mean score over last 1 times:61.96059055944196
  epoch 227 start, epsilon: 0.001 time: 2020-06-29 02:32:59.982110
  부족분 점수: 27.04057008684571
  추가분 점수: 9.496823890512163
  기타 점수: 30.0
  [Episode 228] - Mean score over last 1 times:66.53739397735788
  epoch 228 start, epsilon: 0.001 time: 2020-06-29 02:33:14.529136
  부족분 점수: 26.253640844181238
  추가분 점수: 6.996056321758923
  기타 점수: 30.0
  [Episode 229] - Mean score over last 1 times:63.24969716594016
  epoch 229 start, epsilon: 0.001 time: 2020-06-29 02:33:29.214116
  부족분 점수: 29.979289314588907
  추가분 점수: 6.632976793525696
  기타 점수: 30.0
  [Episode 230] - Mean score over last 1 times:66.6122661081146
  epoch 230 start, epsilon: 0.001 time: 2020-06-29 02:33:41.136095
  부족분 점수: 30.886527317429387
  추가분 점수: 4.723177872883733
  기타 점수: 30.0
  [Episode 231] - Mean score over last 1 times:65.60970519031312
  epoch 231 start, epsilon: 0.001 time: 2020-06-29 02:33:53.338084
  부족분 점수: 29.93134122847252
  추가분 점수: 5.197209410635613
  기타 점수: 30.0
  [Episode 232] - Mean score over last 1 times:65.12855063910814
  epoch 232 start, epsilon: 0.001 time: 2020-06-29 02:34:05.772086
  부족분 점수: 30.412557836466842
  추가분 점수: 5.075520347714635
  기타 점수: 30.0
  [Episode 233] - Mean score over last 1 times:65.48807818418148
  epoch 233 start, epsilon: 0.001 time: 2020-06-29 02:34:19.075098
  부족분 점수: 30.871053057633247
  추가분 점수: 4.522582680687406
  기타 점수: 30.0
  [Episode 234] - Mean score over last 1 times:65.39363573832065
  epoch 234 start, epsilon: 0.001 time: 2020-06-29 02:34:33.276073
  부족분 점수: 31.383113733198197
  추가분 점수: 5.014519752645324
  기타 점수: 30.0
  [Episode 235] - Mean score over last 1 times:66.39763348584353
  epoch 235 start, epsilon: 0.001 time: 2020-06-29 02:34:46.865091
  부족분 점수: 31.485396839343267
  추가분 점수: 4.998537978908679
  기타 점수: 30.0
  [Episode 236] - Mean score over last 1 times:66.48393481825195
  epoch 236 start, epsilon: 0.001 time: 2020-06-29 02:34:59.737999
  부족분 점수: 30.061972306082517
```

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추가분 점수: 5.2166811107427975
기타 점수: 30.0
[Episode 237] - Mean score over last 1 times:65.2786534168253
epoch 237 start, epsilon: 0.001 time: 2020-06-29 02:35:11.913504
부족분 점수: 29.97687462961774
추가분 점수: 5.29544407930612
기타 점수: 30.0
[Episode 238] - Mean score over last 1 times:65.27231870892386
epoch 238 start, epsilon: 0.001 time: 2020-06-29 02:35:25.717420
부족분 점수: 29.204043337758208
추가분 점수: 3.4185168243021757
기타 점수: 30.0
[Episode 239] - Mean score over last 1 times:62.62256016206038
epoch 239 start, epsilon: 0.001 time: 2020-06-29 02:35:37.523465
부족분 점수: 29.171306845324686
추가분 점수: 3.4185168243021757
기타 점수: 30.0
[Episode 240] - Mean score over last 1 times:62.58982366962686
epoch 240 start, epsilon: 0.001 time: 2020-06-29 02:35:49.991072
부족분 점수: 29.171306845324686
추가분 점수: 3.4185168243021757
기타 점수: 30.0
[Episode 241] - Mean score over last 1 times:62.58982366962686
epoch 241 start, epsilon: 0.001 time: 2020-06-29 02:36:02.304532
부족분 점수: 29.652670914996637
추가분 점수: 2.323490368755574
기타 점수: 30.0
[Episode 242] - Mean score over last 1 times:61.97616128375221
epoch 242 start, epsilon: 0.001 time: 2020-06-29 02:36:18.569967
부족분 점수: 28.423089365155974
추가분 점수: 2.3698136115115953
기타 점수: 30.0
[Episode 243] - Mean score over last 1 times:60.79290297666757
epoch 243 start, epsilon: 0.001 time: 2020-06-29 02:36:34.545040
부족분 점수: 28.423089365155974
추가분 점수: 2.3698136115115953
기타 점수: 30.0
[Episode 244] - Mean score over last 1 times:60.79290297666757
epoch 244 start, epsilon: 0.001 time: 2020-06-29 02:36:49.385967
부족분 점수: 28.46078425649976
추가분 점수: 3.096391090488322
기타 점수: 30.0
[Episode 245] - Mean score over last 1 times:61.55717534698808
epoch 245 start, epsilon: 0.001 time: 2020-06-29 02:37:02.430026
부족분 점수: 27.96472931719406
추가분 점수: 3.1843114292323738
기타 점수: 30.0
[Episode 246] - Mean score over last 1 times:61.14904074642644
epoch 246 start, epsilon: 0.001 time: 2020-06-29 02:37:14.874496
부족분 점수: 25.080799782985565
추가분 점수: 2.7189297477207197
```

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2020. 6. 29.
  기타 점수: 30.0
  [Episode 247] - Mean score over last 1 times:57.79972953070629
  epoch 247 start, epsilon: 0.001 time: 2020-06-29 02:37:27.841003
  부족분 점수: 25.080799782985565
```

추가분 점수: 2.6281326774156

기타 점수: 30.0

[Episode 248] - Mean score over last 1 times:57.708932460401165

epoch 248 start, epsilon: 0.001 time: 2020-06-29 02:37:40.145989

부족분 점수: 24.659309762608206 추가분 점수: 3.6734731495325934

기타 점수: 30.0

[Episode 249] - Mean score over last 1 times:58.3327829121408

epoch 249 start, epsilon: 0.001 time: 2020-06-29 02:37:52.717011 부족분 점수: 24.596672342917213

추가분 점수: 3.6907851504861777

기타 점수: 30.0

[Episode 250] - Mean score over last 1 times:58.287457493403394

epoch 250 start, epsilon: 0.001 time: 2020-06-29 02:38:05.697081

부족분 점수: 24.552046752724895 추가분 점수: 2.3065218306261315

기타 점수: 30.0

[Episode 251] - Mean score over last 1 times:56.85856858335103

epoch 251 start, epsilon: 0.001 time: 2020-06-29 02:38:18.221170

부족분 점수: 22.276843631944253

추가분 점수: 0 기타 점수: 30.0

[Episode 252] - Mean score over last 1 times:52.27684363194425

epoch 252 start, epsilon: 0.001 time: 2020-06-29 02:38:30.088969

부족분 점수: 22.276843631944253

추가분 점수: 0 기타 점수: 30.0

[Episode 253] - Mean score over last 1 times:52.27684363194425

epoch 253 start, epsilon: 0.001 time: 2020-06-29 02:38:42.892966

부족분 점수: 24.452378019239447

추가분 점수: 0 기타 점수: 30.0

[Episode 254] - Mean score over last 1 times:54.45237801923945

epoch 254 start, epsilon: 0.001 time: 2020-06-29 02:38:55.599446

부족분 점수: 24.17542655594343

추가분 점수: 0 기타 점수: 30.0

[Episode 255] - Mean score over last 1 times:54.17542655594343

epoch 255 start, epsilon: 0.001 time: 2020-06-29 02:39:09.610947

부족분 점수: 23.774507439595244

추가분 점수: 0 기타 점수: 30.0

[Episode 256] - Mean score over last 1 times:53.77450743959524

epoch 256 start, epsilon: 0.001 time: 2020-06-29 02:39:23.338661

부족분 점수: 23.66765916568026

추가분 점수: 0

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기타 점수: 30.0
[Episode 257] - Mean score over last 1 times:53.66765916568026
epoch 257 start, epsilon: 0.001 time: 2020-06-29 02:39:37.007653
부족분 점수: 23.422018731934024
추가분 점수: 0
기타 점수: 30.0
[Episode 258] - Mean score over last 1 times:53.422018731934024
epoch 258 start, epsilon: 0.001 time: 2020-06-29 02:39:51.375650
부족분 점수: 23.422018731934024
추가분 점수: 0
기타 점수: 30.0
[Episode 259] - Mean score over last 1 times:53.422018731934024
epoch 259 start, epsilon: 0.001 time: 2020-06-29 02:40:08.250225
부족분 점수: 23.422018731934024
추가분 점수: 0
기타 점수: 30.0
[Episode 260] - Mean score over last 1 times:53.422018731934024
epoch 260 start. epsilon: 0.001 time: 2020-06-29 02:40:22.401436
부족분 점수: 22.978010084535477
추가분 점수: 0
기타 점수: 30.0
[Episode 261] - Mean score over last 1 times:52.97801008453548
epoch 261 start, epsilon: 0.001 time: 2020-06-29 02:40:34.924192
부족분 점수: 22.978010084535477
추가분 점수: 0
기타 점수: 30.0
[Episode 262] - Mean score over last 1 times:52.97801008453548
epoch 262 start, epsilon: 0.001 time: 2020-06-29 02:40:49.765235
부족분 점수: 22.978010084535477
추가분 점수: 0
기타 점수: 30.0
[Episode 263] - Mean score over last 1 times:52.97801008453548
epoch 263 start, epsilon: 0.001 time: 2020-06-29 02:41:02.579265
부족분 점수: 22.978010084535477
추가분 점수: 0
기타 점수: 30.0
[Episode 264] - Mean score over last 1 times:52.97801008453548
epoch 264 start, epsilon: 0.001 time: 2020-06-29 02:41:17.192002
부족분 점수: 22.978010084535477
추가분 점수: 0
기타 점수: 30.0
[Episode 265] - Mean score over last 1 times:52.97801008453548
epoch 265 start, epsilon: 0.001 time: 2020-06-29 02:41:31.028199
부족분 점수: 22.978010084535477
추가분 점수: 0
기타 점수: 30.0
[Episode 266] - Mean score over last 1 times:52.97801008453548
epoch 266 start, epsilon: 0.001 time: 2020-06-29 02:41:45.832107
부족분 점수: 22.978010084535477
추가분 점수: 0
기타 점수: 30.0
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[Episode 267] - Mean score over last 1 times:52.97801008453548 epoch 267 start, epsilon: 0.001 time: 2020-06-29 02:42:00.088150 부족분 점수: 23.017029058859634 추가분 점수: 0 기타 점수: 30.0 [Episode 268] - Mean score over last 1 times:53.017029058859634 epoch 268 start, epsilon: 0.001 time: 2020-06-29 02:42:13.946213 부족분 점수: 22.955775628455555 추가분 점수: 0 기타 점수: 30.0 [Episode 269] - Mean score over last 1 times:52.955775628455555 epoch 269 start, epsilon: 0.001 time: 2020-06-29 02:42:26.794174 부족분 점수: 22.978010084535477 추가분 점수: 0 기타 점수: 30.0 [Episode 270] - Mean score over last 1 times:52.97801008453548 epoch 270 start, epsilon: 0.001 time: 2020-06-29 02:42:40.864703 부족분 점수: 22.925722631343042 추가분 점수: 0 기타 점수: 30.0 [Episode 271] - Mean score over last 1 times:52.92572263134304 epoch 271 start, epsilon: 0.001 time: 2020-06-29 02:42:55.522253 부족분 점수: 22.859100674237798 추가분 점수: 0 기타 점수: 30.0 [Episode 272] - Mean score over last 1 times:52.859100674237794 epoch 272 start, epsilon: 0.001 time: 2020-06-29 02:43:10.162211 부족분 점수: 22.93957788480355 추가분 점수: 0 기타 점수: 30.0 [Episode 273] - Mean score over last 1 times:52.939577884803555 epoch 273 start, epsilon: 0.001 time: 2020-06-29 02:43:23.361234 부족분 점수: 22.93957788480355 추가분 점수: 0 기타 점수: 30.0 [Episode 274] - Mean score over last 1 times:52.939577884803555 epoch 274 start, epsilon: 0.001 time: 2020-06-29 02:43:38.742206 부족분 점수: 18.394871958718102 추가분 점수: 0 기타 점수: 30.0 [Episode 275] - Mean score over last 1 times:48.3948719587181 epoch 275 start, epsilon: 0.001 time: 2020-06-29 02:43:51.367205 부족분 점수: 15.65931652126843 추가분 점수: 0 기타 점수: 30.0 [Episode 276] - Mean score over last 1 times:45.65931652126843 epoch 276 start, epsilon: 0.001 time: 2020-06-29 02:44:03.555187 부족분 점수: 15.532462613088516 추가분 점수: 0 기타 점수: 30.0 [Episode 277] - Mean score over last 1 times:45.53246261308851

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epoch 277 start, epsilon: 0.001 time: 2020-06-29 02:44:16.441422
부족분 점수: 14.118154590835319
추가분 점수: 0
기타 점수: 30.0
[Episode 278] - Mean score over last 1 times:44.11815459083532
epoch 278 start, epsilon: 0.001 time: 2020-06-29 02:44:30.272164
부족분 점수: 12.35898132244247
추가분 점수: 0
기타 점수: 30.0
[Episode 279] - Mean score over last 1 times:42.35898132244247
epoch 279 start, epsilon: 0.001 time: 2020-06-29 02:44:45.570884
부족분 점수: 12.35898132244247
추가분 점수: 0
기타 점수: 30.0
[Episode 280] - Mean score over last 1 times:42.35898132244247
epoch 280 start, epsilon: 0.001 time: 2020-06-29 02:45:00.561172
부족분 점수: 12.35898132244247
추가분 점수: 0
기타 점수: 30.0
[Episode 281] - Mean score over last 1 times:42.35898132244247
epoch 281 start, epsilon: 0.001 time: 2020-06-29 02:45:13.182186
부족분 점수: 15.971038219301937
추가분 점수: 3.550537421011999
기타 점수: 30.0
[Episode 282] - Mean score over last 1 times:49.521575640313934
epoch 282 start, epsilon: 0.001 time: 2020-06-29 02:45:26.711162
부족분 점수: 17.441810239554567
추가분 점수: 1.573384764689565
기타 점수: 30.0
[Episode 283] - Mean score over last 1 times:49.015195004244134
epoch 283 start, epsilon: 0.001 time: 2020-06-29 02:45:39.219160
부족분 점수: 17.371125406018834
추가분 점수: 1.614654372868527
기타 점수: 30.0
[Episode 284] - Mean score over last 1 times:48.98577977888736
epoch 284 start, epsilon: 0.001 time: 2020-06-29 02:45:52.155115
부족분 점수: 17.260639744055684
추가분 점수: 0.9543025477384148
기타 점수: 30.0
[Episode 285] - Mean score over last 1 times:48.2149422917941
epoch 285 start, epsilon: 0.001 time: 2020-06-29 02:46:06.067147
부족분 점수: 18.21818214773632
추가분 점수: 0.962669769096518
기타 점수: 30.0
[Episode 286] - Mean score over last 1 times:49.180851916832836
epoch 286 start, epsilon: 0.001 time: 2020-06-29 02:46:20.657219
부족분 점수: 19.89786128341428
추가분 점수: 0.7679011564374849
기타 점수: 30.0
[Episode 287] - Mean score over last 1 times:50.66576243985176
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epoch 287 start, epsilon: 0.001 time: 2020-06-29 02:46:36.316201
부족분 점수: 27.95575873180499
추가분 점수: 4.871771318888028
기타 점수: 30.0
[Episode 288] - Mean score over last 1 times:62.82753005069302
epoch 288 start, epsilon: 0.001 time: 2020-06-29 02:46:48.353127
부족분 점수: 33.52096551762275
추가분 점수: 7.333870134801479
기타 점수: 30.0
[Episode 289] - Mean score over last 1 times:70.85483565242423
epoch 289 start, epsilon: 0.001 time: 2020-06-29 02:47:03.768158
부족분 점수: 28.793821847246292
추가분 점수: 6.801460976571105
기타 점수: 30.0
[Episode 290] - Mean score over last 1 times:65.5952828238174
epoch 290 start, epsilon: 0.001 time: 2020-06-29 02:47:17.069135
부족분 점수: 29.11437127716866
추가분 점수: 6.73088888977639
기타 점수: 30.0
[Episode 291] - Mean score over last 1 times:65.84526016694505
epoch 291 start, epsilon: 0.001 time: 2020-06-29 02:47:29.931128
부족분 점수: 26.9407707883332
추가분 점수: 7.126731330660386
기타 점수: 30.0
[Episode 292] - Mean score over last 1 times:64.06750211899359
epoch 292 start, epsilon: 0.001 time: 2020-06-29 02:47:43.670327
부족분 점수: 27.685613546567012
추가분 점수: 6.756064899113172
기타 점수: 30.0
[Episode 293] - Mean score over last 1 times:64.44167844568018
epoch 293 start, epsilon: 0.001 time: 2020-06-29 02:47:56.678152
부족분 점수: 28.152672297449865
추가분 점수: 6.862572782322294
기타 점수: 30.0
[Episode 294] - Mean score over last 1 times:65.01524507977216
epoch 294 start, epsilon: 0.001 time: 2020-06-29 02:48:10.126059
부족분 점수: 28.22996832953261
추가분 점수: 6.862572782322294
기타 점수: 30.0
[Episode 295] - Mean score over last 1 times:65.0925411118549
epoch 295 start, epsilon: 0.001 time: 2020-06-29 02:48:23.888567
부족분 점수: 28.35111577800013
추가분 점수: 6.655967912338947
기타 점수: 30.0
[Episode 296] - Mean score over last 1 times:65.00708369033907
epoch 296 start, epsilon: 0.001 time: 2020-06-29 02:48:36.551573
부족분 점수: 27.87951029205707
추가분 점수: 6.635883631845947
기타 점수: 30.0
[Episode 297] - Mean score over last 1 times:64.51539392390302
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epoch 297 start, epsilon: 0.001 time: 2020-06-29 02:48:49.768575
부족분 점수: 27.87868696435698
추가분 점수: 7.106404352822954
기타 점수: 30.0
[Episode 298] - Mean score over last 1 times:64.98509131717994
epoch 298 start, epsilon: 0.001 time: 2020-06-29 02:49:03.264838
부족분 점수: 28.010920151652048
추가분 점수: 7.115653886552202
기타 점수: 30.0
[Episode 299] - Mean score over last 1 times:65.12657403820425
epoch 299 start, epsilon: 0.001 time: 2020-06-29 02:49:18.655180
부족분 점수: 29.790393977665087
추가분 점수: 6.752104938645189
기타 점수: 30.0
[Episode 300] - Mean score over last 1 times:66.54249891631028
epoch 300 start, epsilon: 0.001 time: 2020-06-29 02:49:31.980739
부족분 점수: 30.938853172100373
추가분 점수: 5.21417671991774
기타 점수: 30.0
[Episode 301] - Mean score over last 1 times:66.15302989201811
epoch 301 start, epsilon: 0.001 time: 2020-06-29 02:49:44.978712
부족분 점수: 30.938853172100373
추가분 점수: 5.21417671991774
기타 점수: 30.0
[Episode 302] - Mean score over last 1 times:66.15302989201811
epoch 302 start, epsilon: 0.001 time: 2020-06-29 02:50:00.159722
부족분 점수: 31.003871483461403
추가분 점수: 5.288477743885487
기타 점수: 30.0
[Episode 303] - Mean score over last 1 times:66.29234922734689
epoch 303 start, epsilon: 0.001 time: 2020-06-29 02:50:14.422692
부족분 점수: 30.32070764401399
추가분 점수: 5.5732317731990255
기타 점수: 30.0
[Episode 304] - Mean score over last 1 times:65.893939417213
epoch 304 start, epsilon: 0.001 time: 2020-06-29 02:50:28.644715
부족분 점수: 30.246185734741637
추가분 점수: 5.630260733750876
기타 점수: 30.0
[Episode 305] - Mean score over last 1 times:65.8764464684925
epoch 305 start, epsilon: 0.001 time: 2020-06-29 02:50:41.061691
부족분 점수: 30.941274001308106
추가분 점수: 5.623852295010603
기타 점수: 30.0
[Episode 306] - Mean score over last 1 times:66.56512629631871
epoch 306 start, epsilon: 0.001 time: 2020-06-29 02:50:53.149692
부족분 점수: 31.389138157152985
추가분 점수: 5.791841252588643
기타 점수: 30.0
[Episode 307] - Mean score over last 1 times:67.18097940974162
epoch 307 start, epsilon: 0.001 time: 2020-06-29 02:51:05.758702
```

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2020. 6. 29.
                                             Untitled - Jupyter Notebook
  부족분 점수: 31.730536517809227
  추가분 점수: 5.621142072260524
  기타 점수: 30.0
  [Episode 308] - Mean score over last 1 times:67.35167859006975
  epoch 308 start, epsilon: 0.001 time: 2020-06-29 02:51:18.363694
  부족분 점수: 31.730536517809227
  추가분 점수: 4.696616338200901
  기타 점수: 30.0
  [Episode 309] - Mean score over last 1 times:66.42715285601012
  epoch 309 start, epsilon: 0.001 time: 2020-06-29 02:51:32.078701
  부족분 점수: 31.730536517809227
  추가분 점수: 5.290945883714793
  기타 점수: 30.0
  [Episode 310] - Mean score over last 1 times:67.02148240152403
  epoch 310 start, epsilon: 0.001 time: 2020-06-29 02:51:47.756678
  부족분 점수: 31.266085995349425
  추가분 점수: 5.339377828460902
  기타 점수: 30.0
  [Episode 311] - Mean score over last 1 times:66.60546382381033
  epoch 311 start, epsilon: 0.001 time: 2020-06-29 02:52:02.570127
  부족분 점수: 31.266085995349425
  추가분 점수: 4.547004792197312
  기타 점수: 30.0
  [Episode 312] - Mean score over last 1 times:65.81309078754674
  epoch 312 start, epsilon: 0.001 time: 2020-06-29 02:52:16.184417
  부족분 점수: 20.96959278764935
  추가분 점수: 0
  기타 점수: 30.0
  [Episode 313] - Mean score over last 1 times:50.96959278764935
  epoch 313 start, epsilon: 0.001 time: 2020-06-29 02:52:30.383691
  부족분 점수: 20.33118510342133
  추가분 점수: 0
  기타 점수: 30.0
  [Episode 314] - Mean score over last 1 times:50.33118510342133
  epoch 314 start, epsilon: 0.001 time: 2020-06-29 02:52:43.470671
  부족분 점수: 19.728245024781245
  추가분 점수: 0
  기타 점수: 30.0
  [Episode 315] - Mean score over last 1 times:49.728245024781245
  epoch 315 start, epsilon: 0.001 time: 2020-06-29 02:52:56.771679
  부족분 점수: 26.593263520469367
  추가분 점수: 0
  기타 점수: 30.0
  [Episode 316] - Mean score over last 1 times:56.593263520469364
  epoch 316 start, epsilon: 0.001 time: 2020-06-29 02:53:09.668647
  부족분 점수: 20.952943442609605
  추가분 점수: 0
  기타 점수: 30.0
  [Episode 317] - Mean score over last 1 times:50.95294344260961
  epoch 317 start, epsilon: 0.001 time: 2020-06-29 02:53:23.878652
  부족분 점수: 20.872625982194613
```

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2020. 6. 29.
                                             Untitled - Jupyter Notebook
  추가분 점수: 0
  기타 점수: 30.0
  [Episode 318] - Mean score over last 1 times:50.87262598219461
  epoch 318 start, epsilon: 0.001 time: 2020-06-29 02:53:36.931628
  부족분 점수: 20.173087752293874
  추가분 점수: 0
  기타 점수: 30.0
  [Episode 319] - Mean score over last 1 times:50.173087752293874
  epoch 319 start, epsilon: 0.001 time: 2020-06-29 02:53:50.302544
  부족분 점수: 20.540566861121512
  추가분 점수: 0
  기타 점수: 30.0
  [Episode 320] - Mean score over last 1 times:50.54056686112151
  epoch 320 start, epsilon: 0.001 time: 2020-06-29 02:54:03.497259
  부족분 점수: 20.581899140513464
  추가분 점수: 0
  기타 점수: 30.0
  [Episode 321] - Mean score over last 1 times:50.581899140513464
  epoch 321 start, epsilon: 0.001 time: 2020-06-29 02:54:18.040367
  부족분 점수: 20.543706566007685
  추가분 점수: 0
  기타 점수: 30.0
  [Episode 322] - Mean score over last 1 times:50.543706566007685
  epoch 322 start, epsilon: 0.001 time: 2020-06-29 02:54:32.869712
  부족분 점수: 20.581487476663423
  추가분 점수: 0
  기타 점수: 30.0
  [Episode 323] - Mean score over last 1 times:50.581487476663426
  epoch 323 start, epsilon: 0.001 time: 2020-06-29 02:54:45.972975
  부족분 점수: 20.537416403821346
  추가분 점수: 0
  기타 점수: 30.0
  [Episode 324] - Mean score over last 1 times:50.53741640382135
  epoch 324 start, epsilon: 0.001 time: 2020-06-29 02:54:59.710237
  부족분 점수: 20.58755030209675
  추가분 점수: 0
  기타 점수: 30.0
  [Episode 325] - Mean score over last 1 times:50.58755030209675
  epoch 325 start, epsilon: 0.001 time: 2020-06-29 02:55:13.439524
  부족분 점수: 18.719091033930624
  추가분 점수: 0
  기타 점수: 30.0
  [Episode 326] - Mean score over last 1 times:48.719091033930624
  epoch 326 start, epsilon: 0.001 time: 2020-06-29 02:55:25.061445
  부족분 점수: 21.010843655906775
  추가분 점수: 0
  기타 점수: 30.0
  [Episode 327] - Mean score over last 1 times:51.010843655906775
  epoch 327 start, epsilon: 0.001 time: 2020-06-29 02:55:36.669404
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부족분 점수: 21.33692904297678

추가분 점수: 0

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기타 점수: 30.0
[Episode 328] - Mean score over last 1 times:51.33692904297678
epoch 328 start, epsilon: 0.001 time: 2020-06-29 02:55:51.084853
부족분 점수: 21.348750554133332
추가분 점수: 0
기타 점수: 30.0
[Episode 329] - Mean score over last 1 times:51.34875055413333
epoch 329 start, epsilon: 0.001 time: 2020-06-29 02:56:03.298908
부족분 점수: 23.030563275959476
추가분 점수: 0
기타 점수: 30.0
[Episode 330] - Mean score over last 1 times:53.03056327595948
epoch 330 start, epsilon: 0.001 time: 2020-06-29 02:56:15.566107
부족분 점수: 23.02419784687518
추가분 점수: 0
기타 점수: 30.0
[Episode 331] - Mean score over last 1 times:53.02419784687518
epoch 331 start. epsilon: 0.001 time: 2020-06-29 02:56:28.502509
부족분 점수: 23.02419784687518
추가분 점수: 0
기타 점수: 30.0
[Episode 332] - Mean score over last 1 times:53.02419784687518
epoch 332 start, epsilon: 0.001 time: 2020-06-29 02:56:41.692239
부족분 점수: 23.043294134128068
추가분 점수: 0
기타 점수: 30.0
[Episode 333] - Mean score over last 1 times:53.04329413412807
epoch 333 start, epsilon: 0.001 time: 2020-06-29 02:56:54.833098
부족분 점수: 32.771602137334135
추가분 점수: 0
기타 점수: 30.0
[Episode 334] - Mean score over last 1 times:62.771602137334135
epoch 334 start, epsilon: 0.001 time: 2020-06-29 02:57:07.820369
부족분 점수: 23.02419784687518
추가분 점수: 0
기타 점수: 30.0
[Episode 335] - Mean score over last 1 times:53.02419784687518
epoch 335 start, epsilon: 0.001 time: 2020-06-29 02:57:21.338218
부족분 점수: 22.795916417492272
추가분 점수: 0
기타 점수: 30.0
[Episode 336] - Mean score over last 1 times:52.79591641749227
epoch 336 start, epsilon: 0.001 time: 2020-06-29 02:57:34.231738
부족분 점수: 22.76215537361106
추가분 점수: 0
기타 점수: 30.0
[Episode 337] - Mean score over last 1 times:52.76215537361106
epoch 337 start, epsilon: 0.001 time: 2020-06-29 02:57:47.360631
부족분 점수: 22.795916417492272
추가분 점수: 0
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기타 점수: 30.0
[Episode 338] - Mean score over last 1 times:52.79591641749227
epoch 338 start, epsilon: 0.001 time: 2020-06-29 02:58:00.718912
부족분 점수: 22.795916417492272
추가분 점수: 0
기타 점수: 30.0
[Episode 339] - Mean score over last 1 times:52.79591641749227
epoch 339 start, epsilon: 0.001 time: 2020-06-29 02:58:14.526983
부족분 점수: 22.67804077499714
추가분 점수: 0
기타 점수: 30.0
[Episode 340] - Mean score over last 1 times:52.67804077499714
epoch 340 start, epsilon: 0.001 time: 2020-06-29 02:58:27.097368
부족분 점수: 22.795916417492272
추가분 점수: 0
기타 점수: 30.0
[Episode 341] - Mean score over last 1 times:52.79591641749227
epoch 341 start. epsilon: 0.001 time: 2020-06-29 02:58:42.145128
부족분 점수: 22.68906814357729
추가분 점수: 0
기타 점수: 30.0
[Episode 342] - Mean score over last 1 times:52.68906814357729
epoch 342 start, epsilon: 0.001 time: 2020-06-29 02:58:56.770018
부족분 점수: 23.422018731934024
추가분 점수: 0
기타 점수: 30.0
[Episode 343] - Mean score over last 1 times:53.422018731934024
epoch 343 start, epsilon: 0.001 time: 2020-06-29 02:59:11.063793
부족분 점수: 21.15834219895468
추가분 점수: 0
기타 점수: 30.0
[Episode 344] - Mean score over last 1 times:51.158342198954685
epoch 344 start, epsilon: 0.001 time: 2020-06-29 02:59:22.049416
부족분 점수: 22.909526423750176
추가분 점수: 0
기타 점수: 30.0
[Episode 345] - Mean score over last 1 times:52.90952642375018
epoch 345 start, epsilon: 0.001 time: 2020-06-29 02:59:34.213886
부족분 점수: 22.909526423750176
추가분 점수: 0
기타 점수: 30.0
[Episode 346] - Mean score over last 1 times:52.90952642375018
epoch 346 start, epsilon: 0.001 time: 2020-06-29 02:59:47.363721
부족분 점수: 22.909526423750176
추가분 점수: 0
기타 점수: 30.0
[Episode 347] - Mean score over last 1 times:52.90952642375018
epoch 347 start, epsilon: 0.001 time: 2020-06-29 02:59:59.760569
부족분 점수: 22.909526423750176
추가분 점수: 0
기타 점수: 30.0
```

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[Episode 348] - Mean score over last 1 times:52.90952642375018
epoch 348 start, epsilon: 0.001 time: 2020-06-29 03:00:12.291062
부족분 점수: 21.15834219895468
추가분 점수: 0
기타 점수: 30.0
[Episode 349] - Mean score over last 1 times:51.158342198954685
epoch 349 start, epsilon: 0.001 time: 2020-06-29 03:00:25.751973
부족분 점수: 21.15834219895468
추가분 점수: 0
기타 점수: 30.0
[Episode 350] - Mean score over last 1 times:51.158342198954685
epoch 350 start, epsilon: 0.001 time: 2020-06-29 03:00:40.847126
부족분 점수: 21.15834219895468
추가분 점수: 0
기타 점수: 30.0
[Episode 351] - Mean score over last 1 times:51.158342198954685
epoch 351 start, epsilon: 0.001 time: 2020-06-29 03:00:54.109202
부족분 점수: 25.882472121294605
추가분 점수: 0
기타 점수: 30.0
[Episode 352] - Mean score over last 1 times:55.882472121294605
epoch 352 start, epsilon: 0.001 time: 2020-06-29 03:01:07.084253
부족분 점수: 27.119879892463572
추가분 점수: 0
기타 점수: 30.0
[Episode 353] - Mean score over last 1 times:57.11987989246357
epoch 353 start, epsilon: 0.001 time: 2020-06-29 03:01:20.098006
부족분 점수: 27.119879892463572
추가분 점수: 0
기타 점수: 30.0
[Episode 354] - Mean score over last 1 times:57.11987989246357
epoch 354 start, epsilon: 0.001 time: 2020-06-29 03:01:34.708996
부족분 점수: 32.55325286636316
추가분 점수: 1.9559593411289367
기타 점수: 30.0
[Episode 355] - Mean score over last 1 times:64.5092122074921
epoch 355 start, epsilon: 0.001 time: 2020-06-29 03:01:48.410152
부족분 점수: 29.161592807310903
추가분 점수: 7.055836057022202
기타 점수: 30.0
[Episode 356] - Mean score over last 1 times:66.2174288643331
epoch 356 start, epsilon: 0.001 time: 2020-06-29 03:02:01.420819
부족분 점수: 29.239394202851354
추가분 점수: 7.058658719301474
기타 점수: 30.0
[Episode 357] - Mean score over last 1 times:66.29805292215283
epoch 357 start, epsilon: 0.001 time: 2020-06-29 03:02:15.943835
부족분 점수: 29.095870980862852
추가분 점수: 6.934950660244301
기타 점수: 30.0
[Episode 358] - Mean score over last 1 times:66.03082164110715
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epoch 358 start, epsilon: 0.001 time: 2020-06-29 03:02:28.952847
부족분 점수: 29.73934766025935
추가분 점수: 8.117738933231502
기타 점수: 30.0
[Episode 359] - Mean score over last 1 times:67.85708659349086
epoch 359 start, epsilon: 0.001 time: 2020-06-29 03:02:42.627822
부족분 점수: 27.040940277098922
추가분 점수: 9.99741573409956
기타 점수: 30.0
[Episode 360] - Mean score over last 1 times:67.03835601119849
epoch 360 start, epsilon: 0.001 time: 2020-06-29 03:02:56.641813
부족분 점수: 27.044551552141684
추가분 점수: 9.899649256255525
기타 점수: 30.0
[Episode 361] - Mean score over last 1 times:66.94420080839721
epoch 361 start, epsilon: 0.001 time: 2020-06-29 03:03:10.564929
부족분 점수: 27.652112096680792
추가분 점수: 9.94718352803907
기타 점수: 30.0
[Episode 362] - Mean score over last 1 times:67.59929562471986
epoch 362 start, epsilon: 0.001 time: 2020-06-29 03:03:23.133952
부족분 점수: 27.734091573087383
추가분 점수: 9.555035002179668
기타 점수: 30.0
[Episode 363] - Mean score over last 1 times:67.28912657526705
epoch 363 start, epsilon: 0.001 time: 2020-06-29 03:03:37.818792
부족분 점수: 27.188500262512505
추가분 점수: 11.423066631480673
기타 점수: 30.0
[Episode 364] - Mean score over last 1 times:68.61156689399317
epoch 364 start, epsilon: 0.001 time: 2020-06-29 03:03:51.918689
부족분 점수: 27.022843964347455
추가분 점수: 11.425043232384551
기타 점수: 30.0
[Episode 365] - Mean score over last 1 times:68.44788719673201
epoch 365 start, epsilon: 0.001 time: 2020-06-29 03:04:05.319815
부족분 점수: 27.04170369849248
추가분 점수: 11.423066631480673
기타 점수: 30.0
[Episode 366] - Mean score over last 1 times:68.46477032997315
epoch 366 start, epsilon: 0.001 time: 2020-06-29 03:04:19.180794
부족분 점수: 22.265404599514056
추가분 점수: 3.9313664198424436
기타 점수: 30.0
[Episode 367] - Mean score over last 1 times:56.196771019356504
epoch 367 start, epsilon: 0.001 time: 2020-06-29 03:04:31.772698
부족분 점수: 22.46956682824985
추가분 점수: 3.9198975878648867
기타 점수: 30.0
[Episode 368] - Mean score over last 1 times:56.389464416114734
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epoch 368 start, epsilon: 0.001 time: 2020-06-29 03:04:44.573281
부족분 점수: 22.46956682824985
추가분 점수: 3.9313664198424436
기타 점수: 30.0
[Episode 369] - Mean score over last 1 times:56.400933248092294
epoch 369 start, epsilon: 0.001 time: 2020-06-29 03:04:58.540771
부족분 점수: 24.342577439653613
추가분 점수: 5.247473566726255
기타 점수: 30.0
[Episode 370] - Mean score over last 1 times:59.590051006379866
epoch 370 start, epsilon: 0.001 time: 2020-06-29 03:05:14.318769
부족분 점수: 24.342577439653613
추가분 점수: 3.637801555290603
기타 점수: 30.0
[Episode 371] - Mean score over last 1 times:57.98037899494422
epoch 371 start, epsilon: 0.001 time: 2020-06-29 03:05:28.653745
부족분 점수: 24.41259715958088
추가분 점수: 4.826480307875407
기타 점수: 30.0
[Episode 372] - Mean score over last 1 times:59.23907746745628
epoch 372 start, epsilon: 0.001 time: 2020-06-29 03:05:42.654744
부족분 점수: 24.055146980891116
추가분 점수: 4.642166113736577
기타 점수: 30.0
[Episode 373] - Mean score over last 1 times:58.697313094627695
epoch 373 start, epsilon: 0.001 time: 2020-06-29 03:05:55.815712
부족분 점수: 28.3354295420424
추가분 점수: 8.869479518648218
기타 점수: 30.0
[Episode 374] - Mean score over last 1 times:67.20490906069062
epoch 374 start, epsilon: 0.001 time: 2020-06-29 03:06:08.316725
부족분 점수: 23.57541727814621
추가분 점수: 4.642166113736577
기타 점수: 30.0
[Episode 375] - Mean score over last 1 times:58.21758339188279
epoch 375 start, epsilon: 0.001 time: 2020-06-29 03:06:21.092523
부족분 점수: 23.58618198061309
추가분 점수: 4.706248043444667
기타 점수: 30.0
[Episode 376] - Mean score over last 1 times:58.29243002405776
epoch 376 start, epsilon: 0.001 time: 2020-06-29 03:06:36.142724
부족분 점수: 23.54006334093478
추가분 점수: 4.631966681033939
기타 점수: 30.0
[Episode 377] - Mean score over last 1 times:58.172030021968716
epoch 377 start, epsilon: 0.001 time: 2020-06-29 03:06:48.399706
부족분 점수: 23.56734375129605
추가분 점수: 4.648462727371314
기타 점수: 30.0
[Episode 378] - Mean score over last 1 times:58.21580647866736
epoch 378 start, epsilon: 0.001 time: 2020-06-29 03:07:01.009720
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부족분 점수: 23.56734375129605
추가분 점수: 4.731021605286257
기타 점수: 30.0
[Episode 379] - Mean score over last 1 times:58.29836535658231
epoch 379 start, epsilon: 0.001 time: 2020-06-29 03:07:13.574899
부족분 점수: 23.56734375129605
추가분 점수: 4.4388176891341935
기타 점수: 30.0
[Episode 380] - Mean score over last 1 times:58.00616144043025
epoch 380 start, epsilon: 0.001 time: 2020-06-29 03:07:27.419656
부족분 점수: 23.56734375129605
추가분 점수: 4.409083270687722
기타 점수: 30.0
[Episode 381] - Mean score over last 1 times:57.976427021983774
epoch 381 start, epsilon: 0.001 time: 2020-06-29 03:07:40.040683
부족분 점수: 30.062360929045433
추가분 점수: 7.390255793784675
기타 점수: 30.0
[Episode 382] - Mean score over last 1 times:67.4526167228301
epoch 382 start, epsilon: 0.001 time: 2020-06-29 03:07:53.550398
부족분 점수: 24.245017715370082
추가분 점수: 11.10557365203898
기타 점수: 30.0
[Episode 383] - Mean score over last 1 times:65.35059136740907
epoch 383 start, epsilon: 0.001 time: 2020-06-29 03:08:07.433676
부족분 점수: 21.773907147682564
추가분 점수: 2.9149818913987757
기타 점수: 30.0
[Episode 384] - Mean score over last 1 times:54.68888903908134
epoch 384 start. epsilon: 0.001 time: 2020-06-29 03:08:21.124529
부족분 점수: 21.765833620832403
추가분 점수: 2.9149818913987757
기타 점수: 30.0
[Episode 385] - Mean score over last 1 times:54.68081551223118
epoch 385 start, epsilon: 0.001 time: 2020-06-29 03:08:34.377182
부족분 점수: 29.2291794095573
추가분 점수: 8.352488093237561
기타 점수: 30.0
[Episode 386] - Mean score over last 1 times:67.58166750279486
epoch 386 start, epsilon: 0.001 time: 2020-06-29 03:08:49.765668
부족분 점수: 21.254325926558554
추가분 점수: 3.311201588408037
기타 점수: 30.0
[Episode 387] - Mean score over last 1 times:54.56552751496659
epoch 387 start, epsilon: 0.001 time: 2020-06-29 03:09:06.160695
부족분 점수: 20.36229951740094
추가분 점수: 0
기타 점수: 30.0
[Episode 388] - Mean score over last 1 times:50.36229951740094
epoch 388 start, epsilon: 0.001 time: 2020-06-29 03:09:19.083650
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2020. 6. 29. Untitled - Jupyter Notebook 부족분 점수: 20.36229951740094 추가분 점수: 0.14138502766288807 기타 점수: 30.0 [Episode 389] - Mean score over last 1 times:50.50368454506383 epoch 389 start, epsilon: 0.001 time: 2020-06-29 03:09:32.521663 부족분 점수: 27.595770983412717 추가분 점수: 9.907097914246734 기타 점수: 30.0 [Episode 390] - Mean score over last 1 times:67.50286889765945 epoch 390 start, epsilon: 0.001 time: 2020-06-29 03:09:45.751634 부족분 점수: 19.961171497009445 추가분 점수: 1.3300637802476922 기타 점수: 30.0 [Episode 391] - Mean score over last 1 times:51.29123527725714 epoch 391 start, epsilon: 0.001 time: 2020-06-29 03:09:58.594737 부족분 점수: 19.961171497009445 추가분 점수: 1.3053098799631213 기타 점수: 30.0 [Episode 392] - Mean score over last 1 times:51.266481376972564 epoch 392 start, epsilon: 0.001 time: 2020-06-29 03:10:11.667079 부족분 점수: 20.17161620763587 추가분 점수: 1.3300637802476922 기타 점수: 30.0 [Episode 393] - Mean score over last 1 times:51.50167998788356 epoch 393 start, epsilon: 0.001 time: 2020-06-29 03:10:26.017144 부족분 점수: 20.12448837710129 추가분 점수: 2.419687608580181 기타 점수: 30.0 [Episode 394] - Mean score over last 1 times:52.54417598568147 epoch 394 start, epsilon: 0.001 time: 2020-06-29 03:10:39.167641 부족분 점수: 15.947796108424884 추가분 점수: 6.19267588568402 기타 점수: 30.0 [Episode 395] - Mean score over last 1 times:52.14047199410891 epoch 395 start, epsilon: 0.001 time: 2020-06-29 03:10:52.333629 부족분 점수: 19.539501757712475 추가분 점수: 2.419687608580181 기타 점수: 30.0 [Episode 396] - Mean score over last 1 times:51.959189366292655 epoch 396 start, epsilon: 0.001 time: 2020-06-29 03:11:06.701553 부족분 점수: 19.166174871731386 추가분 점수: 0.22733060877403233 기타 점수: 30.0 [Episode 397] - Mean score over last 1 times:49.39350548050542 epoch 397 start, epsilon: 0.001 time: 2020-06-29 03:11:19.587624 부족분 점수: 19.242560020742943 추가분 점수: 0.21913911258176766 기타 점수: 30.0 [Episode 398] - Mean score over last 1 times:49.461699133324714 epoch 398 start, epsilon: 0.001 time: 2020-06-29 03:11:34.273111 부족분 점수: 19.42629419894977

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추가분 점수: 0.21586177679647545
기타 점수: 30.0
[Episode 399] - Mean score over last 1 times:49.64215597574625
epoch 399 start, epsilon: 0.001 time: 2020-06-29 03:11:47.350579
부족분 점수: 19.482808886900887
추가분 점수: 0.425440457278663
기타 점수: 30.0
[Episode 400] - Mean score over last 1 times:49.90824934417955
epoch 400 start, epsilon: 0.001 time: 2020-06-29 03:12:02.112553
부족분 점수: 17.488440386927152
추가분 점수: 0
기타 점수: 30.0
[Episode 401] - Mean score over last 1 times: 47.48844038692715
epoch 401 start, epsilon: 0.001 time: 2020-06-29 03:12:14.273567
부족분 점수: 17.46297867058997
추가분 점수: 0
기타 점수: 30.0
[Episode 402] - Mean score over last 1 times:47.46297867058997
epoch 402 start, epsilon: 0.001 time: 2020-06-29 03:12:26.491641
부족분 점수: 17.488440386927152
추가분 점수: 0
기타 점수: 30.0
[Episode 403] - Mean score over last 1 times: 47.48844038692715
epoch 403 start, epsilon: 0.001 time: 2020-06-29 03:12:40.533578
부족분 점수: 17.595288660842133
추가분 점수: 0
기타 점수: 30.0
[Episode 404] - Mean score over last 1 times: 47.59528866084213
epoch 404 start. epsilon: 0.001 time: 2020-06-29 03:12:54.701941
부족분 점수: 17.593046014494867
추가분 점수: 0
기타 점수: 30.0
[Episode 405] - Mean score over last 1 times:47.59304601449487
epoch 405 start, epsilon: 0.001 time: 2020-06-29 03:13:06.330964
부족분 점수: 17.595288660842133
추가분 점수: 0
기타 점수: 30.0
[Episode 406] - Mean score over last 1 times:47.59528866084213
epoch 406 start, epsilon: 0.001 time: 2020-06-29 03:13:19.012588
부족분 점수: 17.593046014494867
추가분 점수: 0
기타 점수: 30.0
[Episode 407] - Mean score over last 1 times:47.59304601449487
epoch 407 start, epsilon: 0.001 time: 2020-06-29 03:13:31.802586
부족분 점수: 18.801125808466328
추가분 점수: 0
기타 점수: 30.0
[Episode 408] - Mean score over last 1 times:48.801125808466324
epoch 408 start, epsilon: 0.001 time: 2020-06-29 03:13:44.693900
부족분 점수: 18.801125808466328
추가분 점수: 0
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기타 점수: 30.0
[Episode 409] - Mean score over last 1 times:48.801125808466324
epoch 409 start, epsilon: 0.001 time: 2020-06-29 03:13:57.272570
부족분 점수: 18.801125808466328
추가분 점수: 0
기타 점수: 30.0
[Episode 410] - Mean score over last 1 times:48.801125808466324
epoch 410 start, epsilon: 0.001 time: 2020-06-29 03:14:13.013529
부족분 점수: 18.801125808466328
추가분 점수: 0
기타 점수: 30.0
[Episode 411] - Mean score over last 1 times:48.801125808466324
epoch 411 start, epsilon: 0.001 time: 2020-06-29 03:14:26.543300
부족분 점수: 18.801125808466328
추가분 점수: 0
기타 점수: 30.0
[Episode 412] - Mean score over last 1 times:48.801125808466324
epoch 412 start. epsilon: 0.001 time: 2020-06-29 03:14:39.029518
부족분 점수: 18.801125808466328
추가분 점수: 0
기타 점수: 30.0
[Episode 413] - Mean score over last 1 times:48.801125808466324
epoch 413 start, epsilon: 0.001 time: 2020-06-29 03:14:51.760543
부족분 점수: 18.861142711261124
추가분 점수: 0
기타 점수: 30.0
[Episode 414] - Mean score over last 1 times:48.861142711261124
epoch 414 start, epsilon: 0.001 time: 2020-06-29 03:15:04.415521
부족분 점수: 18.801125808466328
추가분 점수: 0
기타 점수: 30.0
[Episode 415] - Mean score over last 1 times:48.801125808466324
epoch 415 start, epsilon: 0.001 time: 2020-06-29 03:15:18.149537
부족분 점수: 18.801125808466328
추가분 점수: 0
기타 점수: 30.0
[Episode 416] - Mean score over last 1 times:48.801125808466324
epoch 416 start, epsilon: 0.001 time: 2020-06-29 03:15:33.067199
부족분 점수: 18.801125808466328
추가분 점수: 0
기타 점수: 30.0
[Episode 417] - Mean score over last 1 times:48.801125808466324
epoch 417 start, epsilon: 0.001 time: 2020-06-29 03:15:48.359592
부족분 점수: 18.801125808466328
추가분 점수: 0
기타 점수: 30.0
[Episode 418] - Mean score over last 1 times:48.801125808466324
epoch 418 start, epsilon: 0.001 time: 2020-06-29 03:16:01.454302
부족분 점수: 19.98040142140769
추가분 점수: 0
기타 점수: 30.0
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[Episode 419] - Mean score over last 1 times:49.98040142140769
epoch 419 start, epsilon: 0.001 time: 2020-06-29 03:16:14.525340
부족분 점수: 19.98040142140769
추가분 점수: 0
기타 점수: 30.0
[Episode 420] - Mean score over last 1 times:49.98040142140769
epoch 420 start, epsilon: 0.001 time: 2020-06-29 03:16:28.303285
부족분 점수: 19.98040142140769
추가분 점수: 0
기타 점수: 30.0
[Episode 421] - Mean score over last 1 times:49.98040142140769
epoch 421 start, epsilon: 0.001 time: 2020-06-29 03:16:41.620293
부족분 점수: 19.98040142140769
추가분 점수: 0
기타 점수: 30.0
[Episode 422] - Mean score over last 1 times:49.98040142140769
epoch 422 start. epsilon: 0.001 time: 2020-06-29 03:16:54.620247
부족분 점수: 20.00005222601083
추가분 점수: 0
기타 점수: 30.0
[Episode 423] - Mean score over last 1 times:50.00005222601083
epoch 423 start, epsilon: 0.001 time: 2020-06-29 03:17:09.236293
부족분 점수: 19.98040142140769
추가분 점수: 0
기타 점수: 30.0
[Episode 424] - Mean score over last 1 times:49.98040142140769
epoch 424 start, epsilon: 0.001 time: 2020-06-29 03:17:22.599336
부족분 점수: 19.98040142140769
추가분 점수: 0
기타 점수: 30.0
[Episode 425] - Mean score over last 1 times:49.98040142140769
epoch 425 start, epsilon: 0.001 time: 2020-06-29 03:17:35.940321
부족분 점수: 20.020412689937555
추가분 점수: 0
기타 점수: 30.0
[Episode 426] - Mean score over last 1 times:50.02041268993756
epoch 426 start, epsilon: 0.001 time: 2020-06-29 03:17:50.021301
부족분 점수: 24.008734953916687
추가분 점수: 0
기타 점수: 30.0
[Episode 427] - Mean score over last 1 times:54.00873495391669
epoch 427 start, epsilon: 0.001 time: 2020-06-29 03:18:03.243359
부족분 점수: 23.69360013246974
추가분 점수: 0
기타 점수: 30.0
[Episode 428] - Mean score over last 1 times:53.69360013246974
epoch 428 start, epsilon: 0.001 time: 2020-06-29 03:18:16.934323
부족분 점수: 22.079466176438512
추가분 점수: 0
기타 점수: 30.0
```

2020. 6. 29. [Episode 429] - Mean score over last 1 times:52.079466176438515 epoch 429 start, epsilon: 0.001 time: 2020-06-29 03:18:30.602282 부족분 점수: 20.741441923293507 추가분 점수: 0 기타 점수: 30.0 [Episode 430] - Mean score over last 1 times:50.74144192329351 epoch 430 start, epsilon: 0.001 time: 2020-06-29 03:18:44.149616 부족분 점수: 20.741441923293507 추가분 점수: 0 기타 점수: 30.0 [Episode 431] - Mean score over last 1 times:50.74144192329351 epoch 431 start, epsilon: 0.001 time: 2020-06-29 03:18:59.670514 부족분 점수: 20.741441923293507 추가분 점수: 0 기타 점수: 30.0 [Episode 432] - Mean score over last 1 times:50.74144192329351 epoch 432 start, epsilon: 0.001 time: 2020-06-29 03:19:13.846416 부족분 점수: 20.741441923293507 추가분 점수: 0 기타 점수: 30.0 [Episode 433] - Mean score over last 1 times:50.74144192329351 epoch 433 start, epsilon: 0.001 time: 2020-06-29 03:19:26.949352 부족분 점수: 25.775474849642855 추가분 점수: 5.741867718887659 기타 점수: 30.0 [Episode 434] - Mean score over last 1 times:61.51734256853051 epoch 434 start, epsilon: 0.001 time: 2020-06-29 03:19:39.903264 부족분 점수: 30.50926965610401 추가분 점수: 10.133908106183469 기타 점수: 30.0 [Episode 435] - Mean score over last 1 times:70.64317776228748 epoch 435 start, epsilon: 0.001 time: 2020-06-29 03:19:54.781184 부족분 점수: 25.61406575500532 추가분 점수: 5.741867718887659 기타 점수: 30.0 [Episode 436] - Mean score over last 1 times:61.355933473892975 epoch 436 start, epsilon: 0.001 time: 2020-06-29 03:20:07.440237 부족분 점수: 25.61406575500532 추가분 점수: 5.741867718887659 기타 점수: 30.0 [Episode 437] - Mean score over last 1 times:61.355933473892975 epoch 437 start, epsilon: 0.001 time: 2020-06-29 03:20:21.474283 부족분 점수: 25.61406575500532 추가분 점수: 5.741867718887659 기타 점수: 30.0 [Episode 438] - Mean score over last 1 times:61.355933473892975 epoch 438 start, epsilon: 0.001 time: 2020-06-29 03:20:34.997236 부족분 점수: 25.61406575500532 추가분 점수: 5.741867718887659 기타 점수: 30.0

[Episode 439] - Mean score over last 1 times:61.355933473892975

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epoch 439 start, epsilon: 0.001 time: 2020-06-29 03:20:48.362266
부족분 점수: 15.131879893692417
추가분 점수: 6.437773783341316
기타 점수: 30.0
[Episode 440] - Mean score over last 1 times:51.569653677033735
epoch 440 start, epsilon: 0.001 time: 2020-06-29 03:21:02.706261
부족분 점수: 15.131879893692417
추가분 점수: 6.265903511523363
기타 점수: 30.0
[Episode 441] - Mean score over last 1 times:51.397783405215776
epoch 441 start, epsilon: 0.001 time: 2020-06-29 03:21:15.656019
부족분 점수: 15.131879893692417
추가분 점수: 8.42037760634675
기타 점수: 30.0
[Episode 442] - Mean score over last 1 times:53.55225750003917
epoch 442 start, epsilon: 0.001 time: 2020-06-29 03:21:29.209555
부족분 점수: 25.54603215954862
추가분 점수: 7.792105454761062
기타 점수: 30.0
[Episode 443] - Mean score over last 1 times:63.33813761430968
epoch 443 start, epsilon: 0.001 time: 2020-06-29 03:21:44.094333
부족분 점수: 15.131879893692417
추가분 점수: 8.42037760634675
기타 점수: 30.0
[Episode 444] - Mean score over last 1 times:53.55225750003917
epoch 444 start, epsilon: 0.001 time: 2020-06-29 03:21:57.872186
부족분 점수: 15.237328817729074
추가분 점수: 8.365824158708088
기타 점수: 30.0
[Episode 445] - Mean score over last 1 times:53.60315297643716
epoch 445 start, epsilon: 0.001 time: 2020-06-29 03:22:11.236718
부족분 점수: 15.153868580309627
추가분 점수: 8.42037760634675
기타 점수: 30.0
[Episode 446] - Mean score over last 1 times:53.57424618665638
epoch 446 start, epsilon: 0.001 time: 2020-06-29 03:22:25.435069
부족분 점수: 15.159160304053692
추가분 점수: 8.42037760634675
기타 점수: 30.0
[Episode 447] - Mean score over last 1 times:53.57953791040045
epoch 447 start, epsilon: 0.001 time: 2020-06-29 03:22:40.588243
부족분 점수: 19.526293185150735
추가분 점수: 8.029691408790498
기타 점수: 30.0
[Episode 448] - Mean score over last 1 times:57.55598459394123
epoch 448 start, epsilon: 0.001 time: 2020-06-29 03:22:55.469220
부족분 점수: 19.852951522280694
추가분 점수: 7.844468482063284
기타 점수: 30.0
[Episode 449] - Mean score over last 1 times:57.69742000434398
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epoch 449 start, epsilon: 0.001 time: 2020-06-29 03:23:09.826194
부족분 점수: 19.891084190479937
추가분 점수: 7.8346008381353105
기타 점수: 30.0
[Episode 450] - Mean score over last 1 times:57.725685028615246
epoch 450 start, epsilon: 0.001 time: 2020-06-29 03:23:24.518206
부족분 점수: 19.852951522280694
추가분 점수: 7.8609841899576764
기타 점수: 30.0
[Episode 451] - Mean score over last 1 times:57.71393571223837
epoch 451 start, epsilon: 0.001 time: 2020-06-29 03:23:41.701695
부족분 점수: 22.415170365855495
추가분 점수: 7.065270532272141
기타 점수: 30.0
[Episode 452] - Mean score over last 1 times:59.48044089812764
epoch 452 start, epsilon: 0.001 time: 2020-06-29 03:23:57.991275
부족분 점수: 22.415170365855495
추가분 점수: 7.098301948060925
기타 점수: 30.0
[Episode 453] - Mean score over last 1 times:59.513472313916424
epoch 453 start, epsilon: 0.001 time: 2020-06-29 03:24:13.488269
부족분 점수: 22.415170365855495
추가분 점수: 7.040516631987572
기타 점수: 30.0
[Episode 454] - Mean score over last 1 times:59.45568699784307
epoch 454 start, epsilon: 0.001 time: 2020-06-29 03:24:27.239269
부족분 점수: 22.449724016253963
추가분 점수: 6.1231538489187525
기타 점수: 30.0
[Episode 455] - Mean score over last 1 times:58.572877865172714
epoch 455 start, epsilon: 0.001 time: 2020-06-29 03:24:41.622329
부족분 점수: 22.415170365855495
추가분 점수: 6.140744798212518
기타 점수: 30.0
[Episode 456] - Mean score over last 1 times:58.55591516406801
epoch 456 start, epsilon: 0.001 time: 2020-06-29 03:24:55.830242
부족분 점수: 22.425054906434028
추가분 점수: 6.136072106302666
기타 점수: 30.0
[Episode 457] - Mean score over last 1 times:58.56112701273669
epoch 457 start, epsilon: 0.001 time: 2020-06-29 03:25:09.404257
부족분 점수: 22.415170365855495
추가분 점수: 6.198530114285871
기타 점수: 30.0
[Episode 458] - Mean score over last 1 times:58.61370048014137
epoch 458 start, epsilon: 0.001 time: 2020-06-29 03:25:22.053230
부족분 점수: 22.43490565371144
추가분 점수: 6.130697742576762
기타 점수: 30.0
[Episode 459] - Mean score over last 1 times:58.5656033962882
epoch 459 start, epsilon: 0.001 time: 2020-06-29 03:25:36.820168
```

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2020. 6. 29.
 부족분 점수: 22.31189496550472
 추가분 점수: 6.29607847173175
 기타 점수: 30.0
 [Episode 460] - Mean score over last 1 times:58.60797343723647
 epoch 460 start, epsilon: 0.001 time: 2020-06-29 03:25:49.819243
 부족분 점수: 22.2964360663
 추가분 점수: 6.29607847173175
 기타 점수: 30.0
 [Episode 461] - Mean score over last 1 times:58.59251453803175
 epoch 461 start, epsilon: 0.001 time: 2020-06-29 03:26:04.404544
 부족분 점수: 22.321762609432692
 추가분 점수: 4.609773084127193
  기타 점수: 30.0
  [Episode 462] - Mean score over last 1 times:56.93153569355989
 epoch 462 start, epsilon: 0.001 time: 2020-06-29 03:26:18.166787
 부족분 점수: 32.31616981809681
 추가분 점수: 4.884360245191905
 기타 점수: 30.0
  [Episode 463] - Mean score over last 1 times:67.20053006328871
 epoch 463 start, epsilon: 0.001 time: 2020-06-29 03:26:32.002152
 부족분 점수: 24.07113274838153
 추가분 점수: 5.32945058543822
 기타 점수: 30.0
  [Episode 464] - Mean score over last 1 times:59.40058333381975
 부족분 점수: 24.0675445142259
  추가분 점수: 5.349016292364894
 기타 점수: 30.0
```

```
epoch 464 start, epsilon: 0.001 time: 2020-06-29 03:26:45.039158
[Episode 465] - Mean score over last 1 times:59.416560806590795
epoch 465 start, epsilon: 0.001 time: 2020-06-29 03:26:57.980202
부족분 점수: 24.09419667639811
추가분 점수: 5.290748039297308
기타 점수: 30.0
[Episode 466] - Mean score over last 1 times:59.38494471569542
epoch 466 start, epsilon: 0.001 time: 2020-06-29 03:27:12.101184
부족분 점수: 24.07113274838153
추가분 점수: 3.439109847582995
기타 점수: 30.0
[Episode 467] - Mean score over last 1 times:57.51024259596453
epoch 467 start, epsilon: 0.001 time: 2020-06-29 03:27:25.754222
부족분 점수: 24.222978338801195
추가분 점수: 3.303488113820754
기타 점수: 30.0
[Episode 468] - Mean score over last 1 times:57.526466452621946
epoch 468 start, epsilon: 0.001 time: 2020-06-29 03:27:39.404185
부족분 점수: 24.222978338801195
추가분 점수: 3.2704763595889874
기타 점수: 30.0
[Episode 469] - Mean score over last 1 times:57.49345469839018
epoch 469 start, epsilon: 0.001 time: 2020-06-29 03:27:53.271006
```

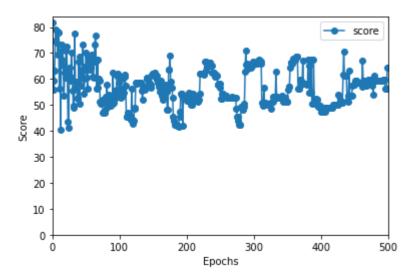
```
2020. 6. 29.
                                             Untitled - Jupyter Notebook
 부족분 점수: 24.616570453042215
 추가분 점수: 3.293010961625249
 기타 점수: 30.0
 [Episode 470] - Mean score over last 1 times:57.909581414667464
 epoch 470 start, epsilon: 0.001 time: 2020-06-29 03:28:07.185416
 부족분 점수: 24.679479755201328
 추가분 점수: 3.3748362176939883
 기타 점수: 30.0
 [Episode 471] - Mean score over last 1 times:58.05431597289532
 epoch 471 start, epsilon: 0.001 time: 2020-06-29 03:28:20.057715
 부족분 점수: 24.666910183242642
 추가분 점수: 5.020592716068992
 기타 점수: 30.0
  [Episode 472] - Mean score over last 1 times:59.68750289931164
 epoch 472 start, epsilon: 0.001 time: 2020-06-29 03:28:34.122673
 부족분 점수: 24.6826194600875
 추가분 점수: 5.008922967555667
 기타 점수: 30.0
  [Episode 473] - Mean score over last 1 times:59.69154242764317
 epoch 473 start, epsilon: 0.001 time: 2020-06-29 03:28:49.516683
 부족분 점수: 24.6826194600875
 추가분 점수: 5.008922967555667
 기타 점수: 30.0
  [Episode 474] - Mean score over last 1 times:59.69154242764317
 epoch 474 start, epsilon: 0.001 time: 2020-06-29 03:29:03.684722
 부족분 점수: 24.50358101467766
 추가분 점수: 5.193076797120073
  기타 점수: 30.0
  [Episode 475] - Mean score over last 1 times:59.696657811797735
 epoch 475 start, epsilon: 0.001 time: 2020-06-29 03:29:19.732611
  부족분 점수: 24.531849111067217
 추가분 점수: 5.164001040833675
 기타 점수: 30.0
 [Episode 476] - Mean score over last 1 times:59.69585015190089
 epoch 476 start, epsilon: 0.001 time: 2020-06-29 03:29:33.364602
 부족분 점수: 24.531849111067217
  추가분 점수: 5.164001040833675
 기타 점수: 30.0
 [Episode 477] - Mean score over last 1 times:59.69585015190089
 epoch 477 start, epsilon: 0.001 time: 2020-06-29 03:29:47.423574
 부족분 점수: 24.531849111067217
 추가분 점수: 2.984753384168699
 기타 점수: 30.0
  [Episode 478] - Mean score over last 1 times:57.516602495235915
 epoch 478 start, epsilon: 0.001 time: 2020-06-29 03:30:02.654446
 부족분 점수: 22.08951353928609
 추가분 점수: 1.7474835511106779
 기타 점수: 30.0
 [Episode 479] - Mean score over last 1 times:53.83699709039677
 epoch 479 start, epsilon: 0.001 time: 2020-06-29 03:30:17.423618
 부족분 점수: 29.35770147796538
```

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추가분 점수: 1.9488185093897759
기타 점수: 30.0
[Episode 480] - Mean score over last 1 times:61.30651998735516
epoch 480 start, epsilon: 0.001 time: 2020-06-29 03:30:35.512558
부족분 점수: 29.31374560955896
추가분 점수: 0
기타 점수: 30.0
[Episode 481] - Mean score over last 1 times:59.313745609558964
epoch 481 start, epsilon: 0.001 time: 2020-06-29 03:30:52.203557
부족분 점수: 29.35770147796538
추가분 점수: 0
기타 점수: 30.0
[Episode 482] - Mean score over last 1 times:59.35770147796538
epoch 482 start, epsilon: 0.001 time: 2020-06-29 03:31:09.199840
부족분 점수: 29.40035476821943
추가분 점수: 0
기타 점수: 30.0
[Episode 483] - Mean score over last 1 times:59.40035476821943
epoch 483 start, epsilon: 0.001 time: 2020-06-29 03:31:27.117290
부족분 점수: 29.35770147796538
추가분 점수: 0
기타 점수: 30.0
[Episode 484] - Mean score over last 1 times:59.35770147796538
epoch 484 start, epsilon: 0.001 time: 2020-06-29 03:31:44.713518
부족분 점수: 29.381604094273484
추가분 점수: 0
기타 점수: 30.0
[Episode 485] - Mean score over last 1 times:59.381604094273484
epoch 485 start, epsilon: 0.001 time: 2020-06-29 03:32:02.604778
부족분 점수: 29.437588841820624
추가분 점수: 0
기타 점수: 30.0
[Episode 486] - Mean score over last 1 times:59.43758884182063
epoch 486 start, epsilon: 0.001 time: 2020-06-29 03:32:19.674546
부족분 점수: 29.467947514702388
추가분 점수: 0
기타 점수: 30.0
[Episode 487] - Mean score over last 1 times:59.46794751470239
epoch 487 start, epsilon: 0.001 time: 2020-06-29 03:32:37.527596
부족분 점수: 29.42529422444835
추가분 점수: 0
기타 점수: 30.0
[Episode 488] - Mean score over last 1 times:59.42529422444835
epoch 488 start, epsilon: 0.001 time: 2020-06-29 03:32:55.101505
부족분 점수: 29.42529422444835
추가분 점수: 0
기타 점수: 30.0
[Episode 489] - Mean score over last 1 times:59.42529422444835
epoch 489 start, epsilon: 0.001 time: 2020-06-29 03:33:13.537523
부족분 점수: 29.42529422444835
추가분 점수: 0
```

```
기타 점수: 30.0
[Episode 490] - Mean score over last 1 times:59.42529422444835
epoch 490 start, epsilon: 0.001 time: 2020-06-29 03:33:31.006522
부족분 점수: 29.42529422444835
추가분 점수: 0
기타 점수: 30.0
[Episode 491] - Mean score over last 1 times:59.42529422444835
epoch 491 start, epsilon: 0.001 time: 2020-06-29 03:33:47.590559
부족분 점수: 29.42529422444835
추가분 점수: 0
기타 점수: 30.0
[Episode 492] - Mean score over last 1 times:59.42529422444835
epoch 492 start, epsilon: 0.001 time: 2020-06-29 03:34:06.789535
부족분 점수: 29.431441533134482
추가분 점수: 0
기타 점수: 30.0
[Episode 493] - Mean score over last 1 times:59.43144153313448
epoch 493 start. epsilon: 0.001 time: 2020-06-29 03:34:23.475421
부족분 점수: 29.632193710575123
추가분 점수: 0
기타 점수: 30.0
[Episode 494] - Mean score over last 1 times:59.63219371057512
epoch 494 start, epsilon: 0.001 time: 2020-06-29 03:34:35.869940
부족분 점수: 29.674708755506384
추가분 점수: 0
기타 점수: 30.0
[Episode 495] - Mean score over last 1 times:59.67470875550639
epoch 495 start, epsilon: 0.001 time: 2020-06-29 03:34:53.673880
부족분 점수: 29.613756392694135
추가분 점수: 0
기타 점수: 30.0
[Episode 496] - Mean score over last 1 times:59.613756392694135
epoch 496 start, epsilon: 0.001 time: 2020-06-29 03:35:10.124874
부족분 점수: 26.307766960166607
추가분 점수: 0
기타 점수: 30.0
[Episode 497] - Mean score over last 1 times:56.3077669601666
epoch 497 start, epsilon: 0.001 time: 2020-06-29 03:35:27.832887
부족분 점수: 26.30572092938951
추가분 점수: 0
기타 점수: 30.0
[Episode 498] - Mean score over last 1 times:56.30572092938951
epoch 498 start, epsilon: 0.001 time: 2020-06-29 03:35:43.825771
부족분 점수: 26.34677057389935
추가분 점수: 0
기타 점수: 30.0
[Episode 499] - Mean score over last 1 times:56.34677057389935
epoch 499 start, epsilon: 0.001 time: 2020-06-29 03:35:55.994231
부족분 점수: 31.695545090555292
추가분 점수: 2.787656105850449
```

기타 점수: 30.0

[Episode 500] - Mean score over last 1 times:64.48320119640574



In []: