

**Московский Государственный Технический Университет им. Н.Э.
Баумана**

Разработка интернет-приложений

Отчёт по лабораторной работе №3

«Python классы»

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1. Цель работы

В лабораторной работе необходимо создать набор классов для реализации работы с VK API.

2. Листинг программы

Модуль `derived_client.py`

```
import requests

class BaseClient:
    # URL vk api
    BASE_URL = None
    # метод vk api
    method = None
    # GET, POST, ...
    http_method = None

    # Получение GET параметров запроса
    def get_params(self):
        return None

    # Получение данных POST запроса
    def get_json(self):
        return None

    # Получение HTTP заголовков
    def get_headers(self):
        return None

    # Склейка url
    def generate_url(self, method):
        return '{0}{1}'.format(self.BASE_URL, method)

    # Отправка запроса к VK API
    def _get_data(self, method, http_method):
        resp = requests.get(self.BASE_URL + self.method,
                             params=self.get_params())
        return self.response_handler(resp)

    # Обработка ответа от VK API
    def response_handler(self, response):
        return response

    # Запуск клиента
    def execute(self):
        return self._get_data(
            self.method,
            http_method=self.http_method
        )
```

Модуль get_user_id.py

```
import json
import base_client

class GetUserId(base_client.BaseClient):
    BASE_URL = "https://api.vk.com/method/"
    method = "users.get"
    http_method = "GET"
    user_ids = ""

    def get_params(self):
        return {
            "user_ids": self.user_ids
        }

    def get_json(self, data):
        return json.dumps(data)

    def response_handler(self, response):
        resp = response.json()
        return resp
```

Модуль derived_client.py

```
import base_client
import json
import get_user_id
import sys
import matplotlib.pyplot as plt
import numpy as np
from _datetime import datetime

def calculate_age(born):
    today = datetime.utcnow()
    return today.year - born.year - ((today.month, today.day) < (born.month,
born.day))

def draw_distribution(array, draw_hist):
    #find min and max in ages to determine range of distribution
    min = array[0]
    max = array[0]
    for i in range(1, len(array)):
        if array[i] < min:
            min = array[i]
        if array[i] > max:
            max = array[i]
    #initialize and count number of people in each age
    distribution = {}
    for i in range(min, max + 1):
        distribution[i] = 0
    for i in range(0, len(array)):
        #key in dict is age
        distribution[array[i]] += 1
    #find max count in distribution
    dmax = 0
    for i in distribution:
        if distribution[i] > dmax:
            dmax = distribution[i]
    #x/dmax, where x is length of the highest column
    relation = 80/dmax;
```

```

#normalize distribution by relation
x = []
y = []
for i in distribution:
    distribution[i] *= relation
    distribution[i] = int(round(distribution[i], 0))
    x.append(i)
    y.append(distribution[i])
if(draw_hist):
    plt.hist([array], range(min, max + 1))
    plt.show()
else:
    #print distribution
    for i in distribution:
        sys.stdout.write(str(i))
        sys.stdout.write(" ")
        for i in range(0, distribution[i]):
            sys.stdout.write("#")
        print('');

class GetFriends(base_client.BaseClient):
    BASE_URL = "https://api.vk.com/method/"
    method = "friends.get"
    http_method = "GET"
    user_id = ""

    def get_params(self):
        return {
            "user_id": self.user_id,
            "fields": "bdate"
        }

    def get_json(self, data):
        return json.dumps(data)

    def response_handler(self, response):
        resp = json.loads(response.text)
        return resp

g = get_user_id.GetUserId()
g.user_ids = "durov"
user = g.execute()
print(user)

uid = user["response"][0]["uid"]
print(uid)

c = GetFriends()
c.user_id = uid
friends = c.execute()
print(friends)

ages = []

for f in friends["response"]:
    if "bdate" in f:
        if len(f["bdate"]) > 5:
            ages.append(calculate_age(datetime.strptime(f["bdate"],
"%d.%m.%Y")))

print(ages)
draw_distribution(ages, False)

plt.show()

```

3. Результат работы

Никнейм пользователя: oblomoff (3000+ друзей)

В режиме вывода в консоль:

```
13 #
14 #####
15 #####
16 #####
17 #####
18 #####
19 #####
20 #####
21 #####
22 #####
23 #####
24 #####
25 #####
26 #####
27 #####
28 #####
29 #####
30 #####
31 #####
32 #####
33 #####
34 #####
35 #####
36 #####
37 #####
38 #####
39 #####
40 #####
41 #####
42 ###
43 ###
```

В режиме построения графика:

