



**МІНІСТЕРСТВО ОСВІТИ І НАУКИ УКРАЇНИ**  
**ННК «ІПСА» НТУУ «КПІ ІМ. ІГОРЯ СІКОРСЬКОГО»**  
**КАФЕДРА ММСА**

**Проект**  
**З дисципліни: Комп'ютерні мережі**

***Програма для завантаження відео з YouTube***

**Виконала:**  
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**Мета проекту:** За допомогою власного програмного продукту продемонструвати роботу з протоколами, які передаються на технічному рівні програми під час надсилання запитів та отримання на них відповідей.

**План реалізації проекту:**

1. За допомогою мови програмування Python написати програму, яка прийматиме посилання на відео з YouTube та буде завантажувати його.
2. Дослідити даний продукт на технічному рівні.
3. Зробити висновки, щодо даного продукту.

**Беклог проекту із розбитими під задачами:**

**1. Реалізація програми :**

**Написання функції, яка:**

- a) Приймає як параметр посилання на відео з YouTube;
- b) Зчитує відповідь на запит «get\_video\_info»;
- c) Декодування байт-рядку та отримання змінної типу dict;
- d) Отримання назви відео та його посилання;
- e) Завантаження

**2. Дослідити які протоколи передаються:**

- a) Розглянути детально, запити які надсилаються серверу;
- b) Розглянути відповіді, що надсилаються сервером;
- c) Проглянути які протоколи передаються.

**3. Оформити документацію до проекту.**

## Хід виконання проекту

### 1. Реалізація

#### 1.1 Код програми:

```
import urllib.request, urllib.parse, sys, os, platform, json

def main(video_url):
    try:
        url = urllib.request.urlopen('https://www.youtube.com/get_video_info?video_id=' +
video_url[video_url.find('=') + 1 :])
        url_data = url.read()
    except:
        print('Cannot read URL DATA!')
        return
    try:
        url_info = urllib.parse.parse_qs(url_data.decode('utf-8'))
        player_response = json.loads(url_info['player_response'][0])
        video_title = player_response['videoDetails']['title']
    except:
        reason = url_info['reason'][0]
        print('Cannot parse URL! Reason:' + reason)
        return
    for symbol in ['\\', '/', ':', '*', '?', '"', '<', '>', '|']:
        video_title = video_title.replace(symbol, ' ')
    file_name = video_title + '.mp4'
    item_url = player_response['streamingData']['formats'][0]['url']

    url = urllib.request.urlopen(item_url)
    length = int(url.headers['Content-Length'])
    buffer = url.read(1024)
    done = 0
    percent1 = 0
    video_file = open(os.path.expanduser('~') + '/Desktop/' + file_name, 'wb+')
    while buffer:
        done += 1024
        percent = done * 100 // length
        if int(percent1) != int(percent) :
            print('\r' + str(percent) + '%')
            percent1 = percent
        video_file.write(buffer)
        buffer = url.read(1024)
    video_file.close()
    print('Download complited!')
```

#### 1.2

Посилання на проект: <https://github.com/ireneshepel/cn-project>

## Приклад змінної player\_response

```
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tube lol.\n\nhttp://pinkguy.bandcamp.com/track/friendzone"}, 'lengthSeconds': '75', 'ownerProfileUrl': 'http://www.youtube.com/user/TVFilthyFrank', 'externalChannelId': 'UCkitABalXafr-NqceQdDXtg', 'availableCountries': ['AD', 'AE', 'AF', 'AG', 'AI', 'AL', 'AM', 'AO', 'AQ', 'AR', 'AS', 'AT', 'AU', 'AW', 'AX', 'AZ', 'BA', 'BB', 'BD', 'BE', 'BF', 'BG', 'BH', 'BI', 'BJ', 'BL', 'BM', 'BN', 'BO', 'BQ', 'BR', 'BS', 'BT', 'BV', 'BW', 'BY', 'BZ', 'CA', 'CC', 'CD', 'CF', 'CG', 'CH', 'CI', 'CK', 'CL', 'CM', 'CN', 'CO', 'CR', 'CU', 'CV', 'CW', 'CX', 'CY', 'CZ', 'DE', 'DJ', 'DK', 'DM', 'DO', 'DZ', 'EC', 'EE', 'EG', 'EH', 'ER', 'ES', 'ET', 'FI', 'FJ', 'FK', 'FM', 'FO', 'FR', 'GA', 'GB', 'GD', 'GE', 'GF', 'GG', 'GH', 'GI', 'GL', 'GM', 'GN', 'GP', 'GQ', 'GR', 'GS', 'GT', 'GU', 'GW', 'GY', 'HK', 'HM', 'HN', 'HR', 'HT', 'HU', 'ID', 'IE', 'IL', 'IM', 'IN', 'IO', 'IQ', 'IR', 'IS', 'IT', 'JE', 'JM', 'JO', 'JP', 'KE', 'KG', 'KH', 'KI', 'KM', 'KN', 'KP', 'KR', 'KW', 'KY', 'KZ', 'LA', 'LB', 'LC', 'LI', 'LK', 'LR', 'LS', 'LT', 'LU', 'LV', 'LY', 'MA', 'MC', 'MD', 'ME', 'MF', 'MG', 'MH', 'MK', 'ML', 'MM', 'MN', 'MO', 'MP', 'MQ', 'MR', 'MS', 'MT', 'MU', 'MV', 'MW', 'MX', 'MY', 'MZ', 'NA', 'NC', 'NE', 'NF', 'NG', 'NI', 'NL', 'NO', 'NP', 'NR', 'NU', 'NZ', 'OM', 'PA', 'PE', 'PF', 'PG', 'PH', 'PK', 'PL', 'PM', 'PN', 'PR', 'PS', 'PT', 'PW', 'PY', 'QA', 'RE', 'RO', 'RS', 'RU', 'RW', 'SA', 'SB', 'SC', 'SD', 'SE', 'SG', 'SH', 'SI', 'SJ', 'SK', 'SL', 'SM', 'SN', 'SO', 'SR', 'SS', 'ST', 'SV', 'SX', 'SY', 'SZ', 'TC', 'TD', 'TF', 'TG', 'TH', 'TJ', 'TK', 'TL', 'TM', 'TN', 'TO', 'TR', 'TT', 'TV', 'TW', 'TZ', 'UA', 'UG', 'UM', 'US', 'UY', 'UZ', 'VA', 'VC', 'VE', 'VG', 'VI', 'VN', 'VU', 'WF', 'WS', 'YE', 'YT', 'ZA', 'ZM', 'ZW'], 'isUnlisted': False, 'hasYpcMetadata': False, 'viewCount': '11102475', 'category': 'Comedy', 'publishDate': '2014-02-10', 'ownerChannelName': 'TVFilthyFrank', 'uploadDate': '2014-02-10', 'trackingParams': 'CAAQu2kiEwj\_uKzE3dTpAhWCELIKHaZhCz8=', 'attestation': {'playerAttestationRenderer': {'challenge': 'a=5&a2=1&b=QXB1ujkxYD1BTogFpCCrpwzM02w&c=1590606116&d=1&e=p37\_Ux1G\_BI&c3a=25&c1a=1&c6a=1&hh=5-qzprR6lVyTLx7bmi8NMtvR7eFLfs5XbpkvC6eQW2U', 'botguardData': {'program': 'JLw5u9Duptroow3j6XDe7QmcgNY7hHNpe7/XEGldNGmdyj+53M2AME5aaQZwQcAyFuM0Ko15jmMOSkYMdxwjT3gZY7p+2iuUBEafhbDIOfccURCIzeB6oSok7cyEyFqoPuRPxYMP4aMv5r1X3DPRZpvcCkLhUbFL+33wlja+U80Aif7XuX8rZfL9xJwef6OSBdd4kV0/4Rq/HMGR9ZFETHcIFTXA7pYt2VpmndSHpu+wjDXMq9DeEeRa50yBqZoeq80XgTzQhPZ6SeUwjh56uxef3uHMwFVlGataY6EMyGLrZmidgHJ5QggLK2dFdcg7g49MMB1r3X09wJMt8O6Y3kVQiIlyIDR9+cdiw6RZzIleag90UGcXNNju4UvgldLBeUs8ZObvM6zMeoVJ6qQILOYiLnXjz+59D7tS8o/DsD907xbMDnDe5b8aZZz3V2qd6b7kMcXNBx3kUcLFgwkbNF9CE6c98oPGMnjbFQprUwi+cBWuTZ/L4QOFhxsHscAPKTb2XyYl8KDRki4JJ3NZ51811IYggs9IBcGYs6aoT0Fw7mCxb4MhqMPWyMAv2MSmf10pQqX8FY6zUwsMABufhuPXjjrRTTjw+KEN245uVicaqx2HFBCJxp7cuPlCqfN9rUhUHzbErkHMxS4bgMYxKnjlHf8otQj1mQ+f0cZh3e2fXVq/zOZIyOW1Hcf26GlxwX4PxaQqrEbamgJqVbuFgxsIlezxEOdUmJ3p909zKb3ZsD8kf9D9MKtBhunMgnSrlWIJ9cwGyoZWtCMzSbZSbviEOWP2QdP2pttX1JjRV01noVIexmcdaTgtu3jToGotKThrXB7kzZIVOodXCQv+E6vREFncVKnjfa9my8Fq9q3W69LmOrvWvrjkBz5LssN48py/6+SaQNAivtJfv07sPUzfnNs+nx8Pn7Qew2xyk/qElRlL6+K+TaTDGf/ZgtukTWGfDChXE+R3CITEHqalPzr3fEmc7PEBavd8S4u0YsplFamz6o+6cytVSjPofNYN3R00Xoy40MQxCTh2U0ebN0eMZQoHpbaVEL539iGkZpGLx0HWcifuseAobpK6AqB1TwlWDI6uUnqCi5K8XciJVE71J6DrQ7fv5k9N+qnlh2kfZ8WXEAMjuqH0ddVt7nOLxSBhlwAJJwKyT0KKXZBm+D/NcBYaqfpvO5uQ+Zesb8kk7fZ+ZdaWjh91EM0EHdzPiqx3i2w3N3WG0Np0o/WkGfWQs7lc5uDjhp2ApteIbvfnK176zo23m+vo3ZAgJBNPopYgg9EkWBU3mZrFMQldgGMMJwp8eHjXydXNuoH932ihlM5ViSq7fs9CM3gQ121y//ocKG2r9sVQycdj0/bPVJV/tsDofQOI5m4vpOWjF/k1Xa+hHcu/aTl6pgwpUWJniGneZpocpc9Kklzediy7bvxtZaWxnmEmZ454eGOLQOSGXOblxpRZep/24AYc2JUfMm48mO2/1YfUbeSkMxBC4DjYoxeeY2/JnXJudSuuy0uFV51b70Ou3teyBkKHwcJY22TztNv82JOKM6x9MPVNDYm4CKML19XGPw9EYrq3GJPLWUhxCoklrrUkfHclhfCrF+JoJK8pG8ayLd93DI1loFPoaVyGXw38+ImnEQu8wgBPjG0hBe3HANI++AHGu2t154t1Azjofg4OXc3LEgimgGyPA8c691BzsnKbu/3ox2vnTXFatBCFd3mBIidmECn9hZSBxwkDPPXEGss6luPBwLaDHntYiYhPl1xnVyUMQ9ueX4gPuTaZpW+Ih1WmSx9Sxxoo+gC8PKvUj0raW4bmrBraZh2mC9n0Nz2NscsRRzxCvegZEqMGchztQIExz8JOxGAtEqzg7kL3Arb2gkMgQvdoa2tG7wvrBoyc3VrRhNvEu+DiLrCVKwLPjBzBwtPGzPiqujFNChXv+b9kjjjllkUoc5wk4FthOJiIzdHvqYbs6dQqAmLQsPMmIYhquXARot9BK9E+wVliFhFvIyIjZCI8lmSMuIST7Dap70ta9w1BFcuaIYfjNRYAvuIU2FJ50PfKkP1JX9gSVqfZtrTjt+6HlRR+UqZKdYbOeKPMmTQg8OPO9OTO NiG1TSuwI1NM/qE+a5P2lN1MbGvsw1WVgsPx1RsmIeoXNkzLhzNY2qtdrJmVjafkRz2wR1bMPk OXPnDNMe7geb5ZhOeLIF8SZuCCz9jPFDNDD2g3lrPbNg+x0rWc3EaPGszbFE3+WGD71+is0OJMRIcDjLJBdXBvnWQsX2cKwnM2CNqd/toX8J1T7k35VAVGgvBTS25KAUkLW3GDuHUo802MgljNhY

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**Висновок:** Під час виконання даного проекту, було покращено навички роботи з Python та роботи з протоколами. У результаті виконання роботи, програма коректно працює, приймає посилання та завантажує відео.