



Ministry of Education of Republic of Moldova Technical University of
Moldova Faculty of Computers, Informatics and Microelectronics
Software Engineering Department

Web Programming
Laboratory work #2

Self made browser

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1 Task

1. You have to write a command line program, using go2web as a starting point;
2. The program should implement the following CLI:

```
...  
go2web -u <URL>      # make an HTTP request to URL and print the response  
go2web -s <search-term> # search the term using your favorite search engine and print top 10  
results  
go2web -h            # show help  
...
```

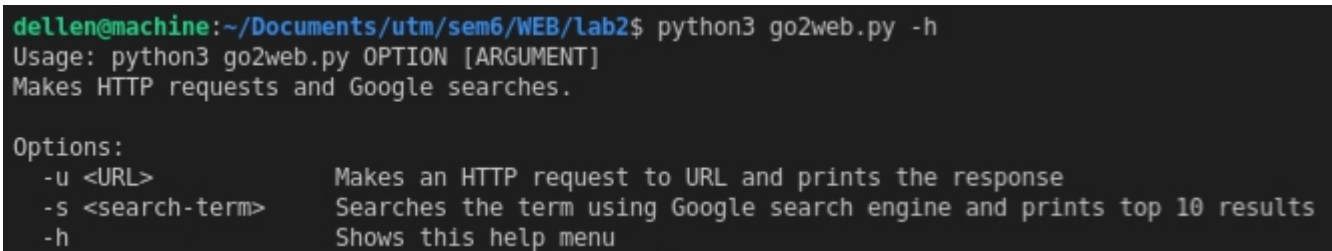
3. The responses from request should be human-readable (e.g. no HTML tags in the output)
4. Add another option to the program.

You can use any programming language, but not the built-in/third-party libraries for making HTTP requests. You can't build a GUI application.

2 Results

Task 1:

The help functionality is trivial, implemented by displaying a string with the necessary information (figure 1).



```
dellen@machine:~/Documents/utm/sem6/WEB/lab2$ python3 go2web.py -h  
Usage: python3 go2web.py OPTION [ARGUMENT]  
Makes HTTP requests and Google searches.  
  
Options:  
-u <URL>          Makes an HTTP request to URL and prints the response  
-s <search-term>   Searches the term using Google search engine and prints top 10 results  
-h                Shows this help menu
```

Figure 1. The help option

Task 2:

The search functionality was implemented using the *sockets* package, which provided the functionality to establish a TCP connection, through the specified port 80 for HTTP protocol. As a search engine I used Google. I used the *find* function for strings and cut only the HTML part of the response. I loaded it into a *BeautifulSoup* object, which provides parsing functionalities. I extracted the results as title and link by the class names of the HTML elements. The output contains the first page results (figure 2).

Some links contained encoded characters, for example the links to YouTube, so I added one more step for decoding the URLs with UTF-8 format, using *unquote* function from *urllib.parse* module.

```
dellen@machine:~/Documents/utm/sem6/WEB/lab2$ python3 go2web.py -s dog
Here are the first page results:
1. DOG | Official Trailer | MGM Studios - YouTube
Link: https://www.youtube.com/watch?v=V4tAtp-TyzQ

2. Dog (2022) - IMDb
Link: https://www.imdb.com/title/tt11252248/

3. Dog - Wikipedia
Link: https://en.wikipedia.org/wiki/Dog

4. Dog - Rotten Tomatoes
Link: https://www.rottentomatoes.com/m/dog_2022

5. Dog, facts and photos - National Geographic
Link: https://www.nationalgeographic.com/animals/mammals/facts/domestic-dog

6. DOG (@dogthefilm) • Instagram photos and videos
Link: https://www.instagram.com/dogthefilm/

7. Dog Breeds - Types Of Dogs - American Kennel Club
Link: https://www.akc.org/dog-breeds/

8. Dog Supplies | Dog Products & Accessories - Dog.com
Link: https://www.dog.com/

9. Dog Care Advice, Tips & Health Information | RSPCA
Link: https://www.rspca.org.uk/adviceandwelfare/pets/dogs
```

Figure 2. The search option with a “dog” search term

Task 3:

For implementing the URL accessing functionality, after getting the response and extracting the HTML, I removed the *head* element and all the *style* and *script* elements. Then I printed all the elements contents and the hyperlinks' *href* attributes values.

```

dellen@machine:~/Documents/utm/sem6/WEB/lab2$ python3 go2web.py -u https://www.google.com/search?q=dog
Making request to www.google.com at /search?q=dog

https://www.google.com/?sa=X&ved=0ahUKEwjplvG0z6_2AhXURd4KHxbICWgQ0wgC
G
o
o
g
l
e
https://www.google.com/?output=search&ie=UTF-8&sa=X&ved=0ahUKEwjplvG0z6_2AhXURd4KHxbICWgQPAgE
G
o
o
g
l
e
x

Faceți clic
https://www.google.com/search?q=dog&ie=UTF-8&gbv=1&sei=RK4jYunkHNSL-Qb2kKfABg
aici
dacă nu sunteți redirecționat în câteva secunde.

1lfe

Toate
https://www.google.com/search?q=dog&ie=UTF-8&source=lnms&tbm=isch&sa=X&ved=0ahUKEwjplvG0z6_2AhXURd4KHxbICWgQ_AUICcgB
Imagini
https://www.google.com/search?q=dog&ie=UTF-8&source=lnms&tbm=vid&sa=X&ved=0ahUKEwjplvG0z6_2AhXURd4KHxbICWgQ_AUICSgC
Videoclipuri
https://www.google.com/search?q=dog&ie=UTF-8&source=lnms&tbm=nws&sa=X&ved=0ahUKEwjplvG0z6_2AhXURd4KHxbICWgQ_AUICigD
Știri
https://www.google.com/search?q=dog&ie=UTF-8&source=lnms&tbm=bks&sa=X&ved=0ahUKEwjplvG0z6_2AhXURd4KHxbICWgQ_AUICygE
Cărți
https://www.google.com/advanced_search
Instrumente de căutare

Orice limbă

Orice limbă
https://www.google.com/search?q=dog&ie=UTF-8&source=lns&tbs=lr:lang_lro&lr=lang_ro&sa=X&ved=0ahUKEwjplvG0z6_2AhXURd4KHxb

```

Figure 3. Accessing the <https://www.google.com/search?q=dog> URL.

At the top, the web page has tabs with links for accessing other sections, such as “Toate”, “Imagini”, “Videoclipuri” and others (figure 4). These can be observed in the output (figure 5).

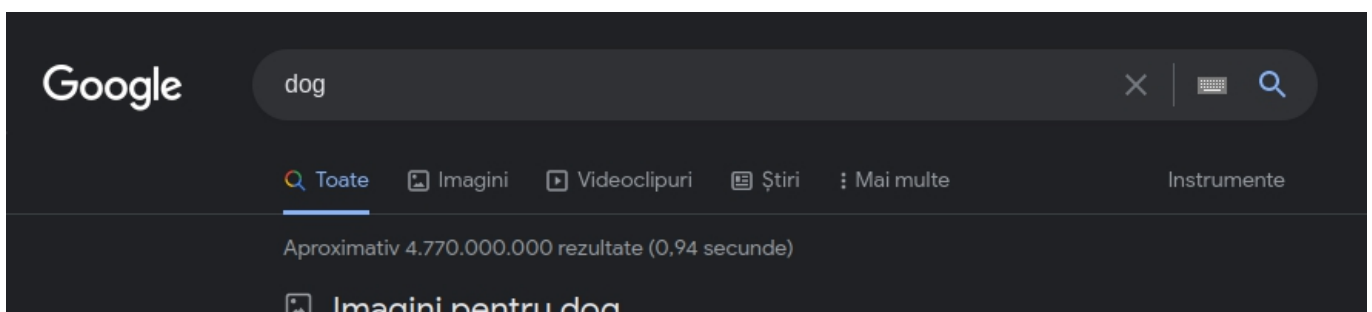


Figure 4. The top section of the page.

```
dellen@machine:~/Documents/utm/sem6/WEB/lab2$ python3 go2web.py -u https://www.google.com/search?q=dog
Making request to www.google.com at /search?q=dog

https://www.google.com/?sa=X&ved=0ahUKEwjplvG0z6_2AhXURd4KHxbICWgQ0wgC
G
o
o
g
l
e
https://www.google.com/?output=search&ie=UTF-8&sa=X&ved=0ahUKEwjplvG0z6_2AhXURd4KHxbICWgQ0PAGe
G
o
o
g
l
e
x

Faceți clic
https://www.google.com/search?q=dog&ie=UTF-8&gbv=1&sei=RK4jYunkHNSL-Qb2kKfABg
aici
dacă nu sunteți redirecționat în câteva secunde.

1lfe

Toate
https://www.google.com/search?q=dog&ie=UTF-8&source=lnms&tbm=isch&sa=X&ved=0ahUKEwjplvG0z6_2AhXURd4KHxbICWgQ_AUICcgB
Imagini
https://www.google.com/search?q=dog&ie=UTF-8&source=lnms&tbm=vid&sa=X&ved=0ahUKEwjplvG0z6_2AhXURd4KHxbICWgQ_AUICSgC
Videoclipuri
https://www.google.com/search?q=dog&ie=UTF-8&source=lnms&tbm=nws&sa=X&ved=0ahUKEwjplvG0z6_2AhXURd4KHxbICWgQ_AUIC1gD
Știri
https://www.google.com/search?q=dog&ie=UTF-8&source=lnms&tbm=bks&sa=X&ved=0ahUKEwjplvG0z6_2AhXURd4KHxbICWgQ_AUICygE
Cărți
https://www.google.com/advanced_search
Instrumente de căutare

Orice limbă

Orice limbă
https://www.google.com/search?q=dog&ie=UTF-8&source=lns&tbs=lr:lang_lro&lr=lang_ro&sa=X&ved=0ahUKEwjplvG0z6_2AhXURd4KHxbICWgQpwUIDQ
```

Figure 5. The way the app prints the tabs from the top section.

The section with images (figure 6), is printed by the app as links to those images (figure 7).

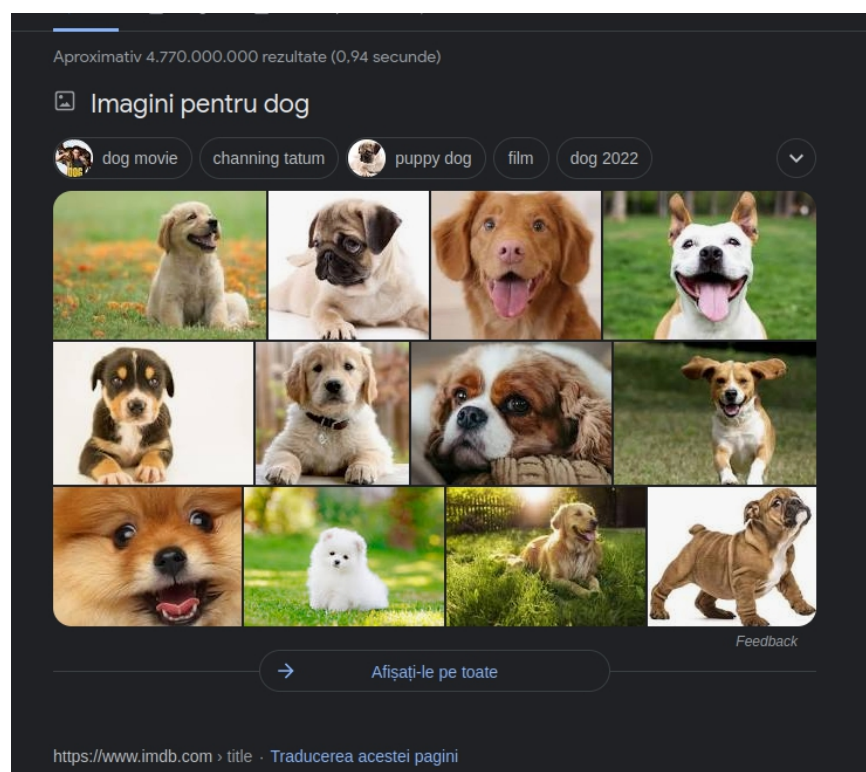


Figure 6. The images section in Firefox.

```

SW_C X
http://www.google.com/search?ie=UTF-8&ei=z6QjYo6lAqi60PEP1teNqAM&q=dog&tbm=isch&sa=X&ved=2ahUKEwj02KCMxq_2AhUo
Imagini
http://www.google.com/search?ie=UTF-8&ei=z6QjYo6lAqi60PEP1teNqAM&q=dog&tbm=isch&sa=X&ved=2ahUKEwj02KCMxq_2AhUo
Afișati-le pe toate
https://www.google.com/imgres?imgurl=https://hips.hearstapps.com/hmg-prod.s3.amazonaws.com/images/dog-puppy-on
om/life/pets/g4531/cutest-dog-breeds/8h=602&w=1200&tbid=wzRcY9R2ANhK-M&q=dog&tbid=75&tbid=150&usg=AI4_-kSjjc7
https://www.google.com/imgres?imgurl=https://i.guim.co.uk/img/media/fele34da640c5c56ed16f76ce6f994fa9343d09d/6
2ad08eae5e&imgrefurl=https://www.theguardian.com/science/2019/jun/17/how-dogs-capture-your-heart-evolution-pup
7gHM&sa=X&ved=2ahUKEwj02KCMxq_2AhUoHTQIHdZrAzUQ9QF6BAGCEAY
https://www.google.com/imgres?imgurl=https://post.medicalnewstoday.com/wp-content/uploads/sites/3/2020/02/3228
140&usg=AI4_-kSKkrojtFU0y-aHW6iFH7n-gFSg8Q&vet=1&docid=_RVRngRfeprTTM&sa=X&ved=2ahUKEwj02KCMxq_2AhUoHTQIHdZrAz
https://www.google.com/imgres?imgurl=https://ggsc.s3.amazonaws.com/images/uploads/The_Science-Backed_Benefits_
1414&w=2121&tbid=MlgdxlTqeiwBWM&q=dog&tbid=100&tbid=150&usg=AI4_-kQjkps5qT0Pjprvhi9HH2_Tax8QMw&vet=1&docid=rQ
https://www.google.com/imgres?imgurl=https://i.natgeo.com/n/3faa2b6a-f351-4995-8fff-36d145116882/domestic-do
j4M&q=dog&tbid=84&tbid=150&usg=AI4_-kS7Za41kzJHGMftatZPX1yLTPQ6Hw&vet=1&docid=PULX44c-W0m0fM&sa=X&ved=2ahUKEwj
https://www.google.com/imgres?imgurl=https://kb.rspca.org.au/wp-content/uploads/2018/11/golder-retriever-puppy
tbid=0htMhQNVZpcSXM&q=dog&tbid=149&tbid=149&usg=AI4_-kSUEs7zmARc8N0BIbVmyW9tWrDgvg&vet=1&docid=SythMZdPj3fzH
http://www.google.com/search?ie=UTF-8&ei=z6QjYo6lAqi60PEP1teNqAM&q=dog&tbm=isch&sa=X&ved=2ahUKEwj02KCMxq_2AhUo
Afișati-le pe toate
https://www.google.com/url?q=https://encrypted-tbn2.gstatic.com/images%3Fq%3Dtn:ANd9GcQYf0lKIXkS4ULGULhHT7o7T
Dog
2022 · Comedie/film pentru familie · 1 h 41 min.
Dog este un film american de comedie-dramă din 2022, regizat de Channing Tatum și Reid Carolin, ambii făcându-
t la...
https://www.google.com/url?q=https://en.wikipedia.org/wiki/Dog_(2022_film)&sa=U&ved=2ahUKEwj02KCMxq_2AhUoHTQIH
Wikipedia (Engleză)
Data lansării
:
18 februarie 2022 (

```

Figure 7. The images section printed by the app, consisting mainly of links to the images.


From the other components, as in the Google search results (figure 8), all the text is extracted, meaning that both the result heading, description, details and the link to access the other page are printed (figure 9).

<https://www.rottentomatoes.com> > ... ▾ Traducerea acestei pagini

Dog - Rotten Tomatoes

DOG is a buddy comedy that follows the misadventures of two former Army Rangers paired against their will on the road trip of a lifetime.


★★★★★ Evaluare: 75% · 117 voturi



<https://www.nationalgeographic.com> > ... ▾ Traducerea acestei pagini

Dog, facts and photos - National Geographic

The term "domestic **dog**" refers to any of several hundred breeds of **dog** in the world today. While these animals vary drastically in appearance, ...



<https://www.instagram.com> > d... · Traducerea acestei pagini

DOG (@dogthefilm) • Instagram photos and videos

42.5k Followers, 11 Following, 50 Posts - See Instagram photos and videos from **DOG** (@dogthefilm)

Figure 8. The section with a Google search result.

```

https://www.google.com/url?q=https://www.rottentomatoes.com/m/dog_2022&sa=U&ved=2ahUKEwj02KCMxq_2AhUoHTQIHdZrAzUQFnoECAQAg&usg=AOvVaw5r0y6K91E1C1
Dog - Rotten Tomatoes
www.rottentomatoes.com > dog_2022
Evaluate
75 %
(117)
DOG is a buddy comedy that follows the misadventures of two former Army Rangers paired against their will on the road trip of a lifetime.
https://www.google.com/url?q=https://www.nationalgeographic.com/animals/mammals/facts/domestic-dog&sa=U&ved=2ahUKEwj02KCMxq_2AhUoHTQIHdZrAzUQFnoECA
Dog, facts and photos - National Geographic
www.nationalgeographic.com > domestic-dog
The term "domestic dog" refers to any of several hundred breeds of dog in the world today. While these animals vary drastically in appearance, ...
https://www.google.com/url?q=https://www.instagram.com/dogthefilm/&sa=U&ved=2ahUKEwj02KCMxq_2AhUoHTQIHdZrAzUQFnoECA0QAg&usg=AOvVaw09WhV-U12pCWQNXcT
DOG (@dogthefilm) • Instagram photos and videos
www.instagram.com > dogthefilm
42.5k Followers, 11 Following, 50 Posts - See Instagram photos and videos from DOG (@dogthefilm)
https://www.google.com/url?q=https://www.akc.org/dog-breeds/&sa=U&ved=2ahUKEwj02KCMxq_2AhUoHTQIHdZrAzUQFnoECAoQAg&usg=AOvVaw2jBrRqk0yFc8KBCmgefX61
Dog Breeds - Types Of Dogs - American Kennel Club
www.akc.org > Dog Breeds
15 feb. 2022
What's a dog breed? People have been breeding dogs since prehistoric times. The earliest dog breeders used wolves to create domestic dogs.
https://www.google.com/url?q=https://www.dog.com/&sa=U&ved=2ahUKEwj02KCMxq_2AhUoHTQIHdZrAzUQFnoECAKQAg&usg=
3935

```

Figure 9. The section with a Google search result, printed by the app.

The source files are available at: <https://github.com/victor0198utm/WEB2>

3 Conclusion

When implementing the tasks, I learned how to create an HTTP request by specifying the method, URI, HTTP version and the needed headers, using TCP sockets and receive the bytes from the server.

I exercised working with BeautifulSoup module to navigate the HTML tree by the ids, class names and tags. I also learned how to decode URLs from the UTF-8 encoding.

References

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Accessed on March 5, 2022