

Proiect Verificare si Validare Software

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An universitar: 2020-2021

In cadrul acestui proiect, am realizat un Web Server in Java care face conexiunea cu niste pagini HTTP, pe care le-am definit ca fiind **index.html**(pagina principala a serverului), **404.html**(pagina care returneaza 404 in momentul in care utilizatorul introduce o adresa gresit, de exemplu index2.html), **maintenance.html**(pagina in care serverul se afla in faza de mentenanta).

De asemenea, noi vom face request-uri de tip GET, pentru a primi de la server informatiile care se afla in paginile web respective. Ca urmare a acestui lucru, am creat inca o pagina **not_supported.html** care returneaza un mesaj cum ca pagina nu poate fi suportata in momentul in care vrem sa trimitem alte request-uri de tip POST,DELETE, etc. Toate aceste pagini web pe care le-am descris mai sus fac parte dintr-un web root.

Fiecare conexiune cu clientul este data de un Thread separat. Atunci cand pornim conexiunea, folosim un ServerSocket care preia portul respectiv. Am setat portul 8080 pentru realizarea conexiunii.

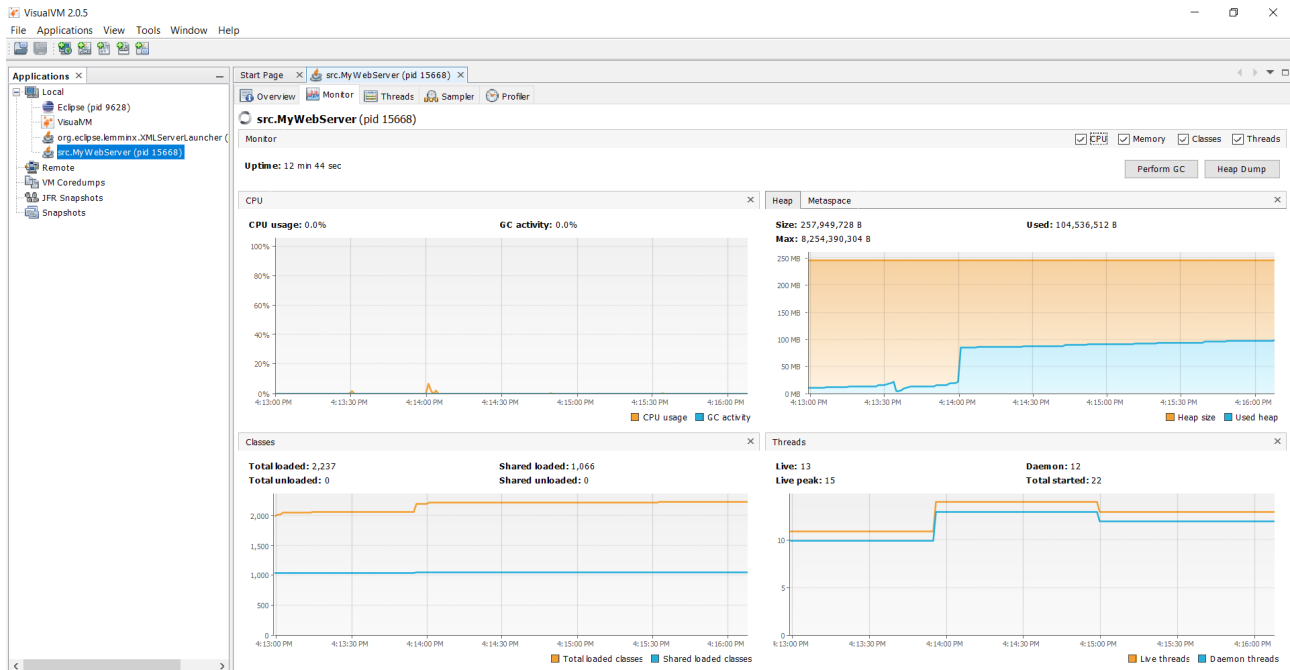
Serverul se poate afla in 3 stari: running, maintenance sau stopped. Acest lucru l-am setat prin niste state-uri, care se modifica in functie de stare.

Pentru analiza statica, am folosit un plugin din Eclipse, SpotBugs care mi-a returnat urmatoarele warning-uri legate de implementare:

The screenshot displays the Eclipse IDE interface with the SpotBugs plugin active. The left sidebar shows the project structure, including packages like 'exceptions', 'gui', 'src', 'test', and 'www'. The main editor area shows the 'Problems' view, which lists 27 warnings. The warnings are categorized by severity (Warning, Error) and type (SpotBugs P, Java Problem, etc.). The warnings include issues related to null values, default encodings, and static final fields.

Description	Resource	Path	Location	Type
dataOut is null guaranteed to be dereferenced in src.WebServer.run() on exception path [Troubling(11), Normal confidence]	WebServer.java	/webserver/src/src	line 164	SpotBugs P
Dereference of the result of readLine() without nullcheck in src.WebServer.run() [Of Concern(15), Normal confidence]	WebServer.java	/webserver/src/src	line 34	SpotBugs P
Found reliance on default encoding in new test.WebServerTest(): new java.util.Scanner(InputStream) [Of Concern(19), High]	WebServerTest.java	/webserver/src/test	line 19	SpotBugs P
Found reliance on default encoding in src.MyWebServer.<static initializer for MyWebServer>(): new java.util.Scanner(Inpi	MyWebServer.java	/webserver/src/src	line 17	SpotBugs P
Found reliance on default encoding in src.WebServer.run(): new java.io.InputStreamReader(InputStream) [Of Concern(19),	WebServer.java	/webserver/src/src	line 25	SpotBugs P
Found reliance on default encoding in src.WebServer.run(): new java.io.PrintWriter(OutputStream) [Of Concern(19), High	WebServer.java	/webserver/src/src	line 27	SpotBugs P
Found reliance on default encoding in test.WebServerTest.AcceptFailureTest(): java.io.ByteArrayOutputStream.toString()	WebServerTest.java	/webserver/src/test	line 43	SpotBugs P
Found reliance on default encoding in test.WebServerTest.cannotClosePortTest(): java.io.ByteArrayOutputStream.toString	WebServerTest.java	/webserver/src/test	line 57	SpotBugs P
Found reliance on default encoding in test.WebServerTest.couldNotListenOnPortTest(): java.io.ByteArrayOutputStream.to	WebServerTest.java	/webserver/src/test	line 50	SpotBugs P
Found reliance on default encoding in test.WebServerTest.setUpStreams(): new java.io.OutputStream(OutputStream) [Of C	WebServerTest.java	/webserver/src/test	line 28	SpotBugs P
in is null guaranteed to be dereferenced in src.WebServer.run() on exception path [Troubling(11), Normal confidence]	WebServer.java	/webserver/src/src	line 162	SpotBugs P
out is null guaranteed to be dereferenced in src.WebServer.run() on exception path [Troubling(11), Normal confidence]	WebServer.java	/webserver/src/src	line 163	SpotBugs P
src.WebServer.readFileData(File, int) ignores result of java.io.FileInputStream.read(byte[])	WebServer.java	/webserver/src/src	line 184	SpotBugs P
The import exceptions.PortOutOfBoundException is never used	MyWebServer.java	/webserver/src/src	line 3	Java Problem
The import exceptions.UsedPortException is never used	MyWebServer.java	/webserver/src/src	line 4	Java Problem
The import java.lang.Integer.parseInt is never used	MyWebServer.java	/webserver/src/src	line 12	Java Problem
The method name test.ConfigManagerTest.NotOutPageDoesNotExistTest() doesn't start with a lower case letter [Of Cono	ConfigManagerTest.java	/webserver/src/test	line 64	SpotBugs P
The method name test.ConfigManagerTest.NotSupportedPageDoesNotExistTest() doesn't start with a lower case letter [Of C	ConfigManagerTest.java	/webserver/src/test	line 39	SpotBugs P
The method name test.ConfigManagerTest.NotSupportedPageDoesNotExistTest() doesn't start with a lower case letter [I	ConfigManagerTest.java	/webserver/src/test	line 35	SpotBugs P
The method name test.WebServerTest.AcceptFailureTest() doesn't start with a lower case letter [Of Concern(16), Normal	WebServerTest.java	/webserver/src/test	line 42	SpotBugs P
The serializable class GivenParameterNotExistingException does not declare a static final serialVersionUID field of type long	GivenParameterNotExistingExcep...	/webserver/src/except...	line 3	Java Problem
The serializable class PortOutOfBoundException does not declare a static final serialVersionUID field of type long	PortOutOfBoundException.java	/webserver/src/except...	line 3	Java Problem
The serializable class UsedPortException does not declare a static final serialVersionUID field of type long	UsedPortException.java	/webserver/src/except...	line 3	Java Problem
Unread field: src.MyWebServer.myObj [Of Concern(20), Low confidence]	MyWebServer.java	/webserver/src/src	line 17	SpotBugs P
Unread field: test.WebServerTest.keyboard [Of Concern(18), Normal confidence]	WebServerTest.java	/webserver/src/test	line 19	SpotBugs P
Unused public or protected field: src.MyWebServer.clientSocket [Of Concern(17), Normal confidence]	MyWebServer.java	/webserver/src/src	line 16	SpotBugs P
Use of non-localized String.toUpperCase() or String.toLowerCase() in src.WebServer.run() [Of Concern(20), Low confiden	WebServer.java	/webserver/src/src	line 35	SpotBugs P

Pentru analiza dinamica, am folosit VisualVM, un instrument care ofera o interfata vizuala destinata vizualizarii informatiilor detaliate despre WebServer in timp ce asta ruleaza pe JVM.



VisualVM 2.0.5

File Applications View Tools Window Help

Applications: Local (Eclipse (pid 9628), VisualVM, org.eclipse.jdt.launcher.XMLServerLauncher, src.MyWebServer (pid 15668), Remote, VM CoreDumps, JFR Snapshots, Snapshots)

Start Page: src.MyWebServer (pid 15668)

Sampler

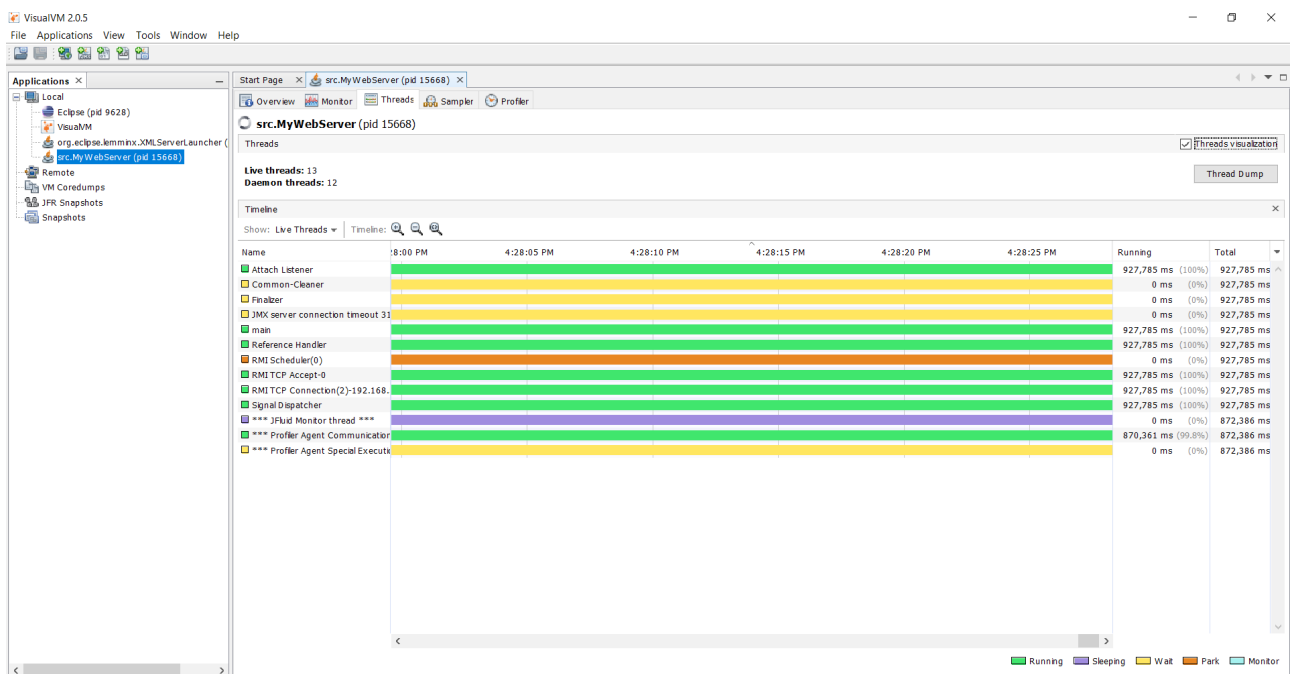
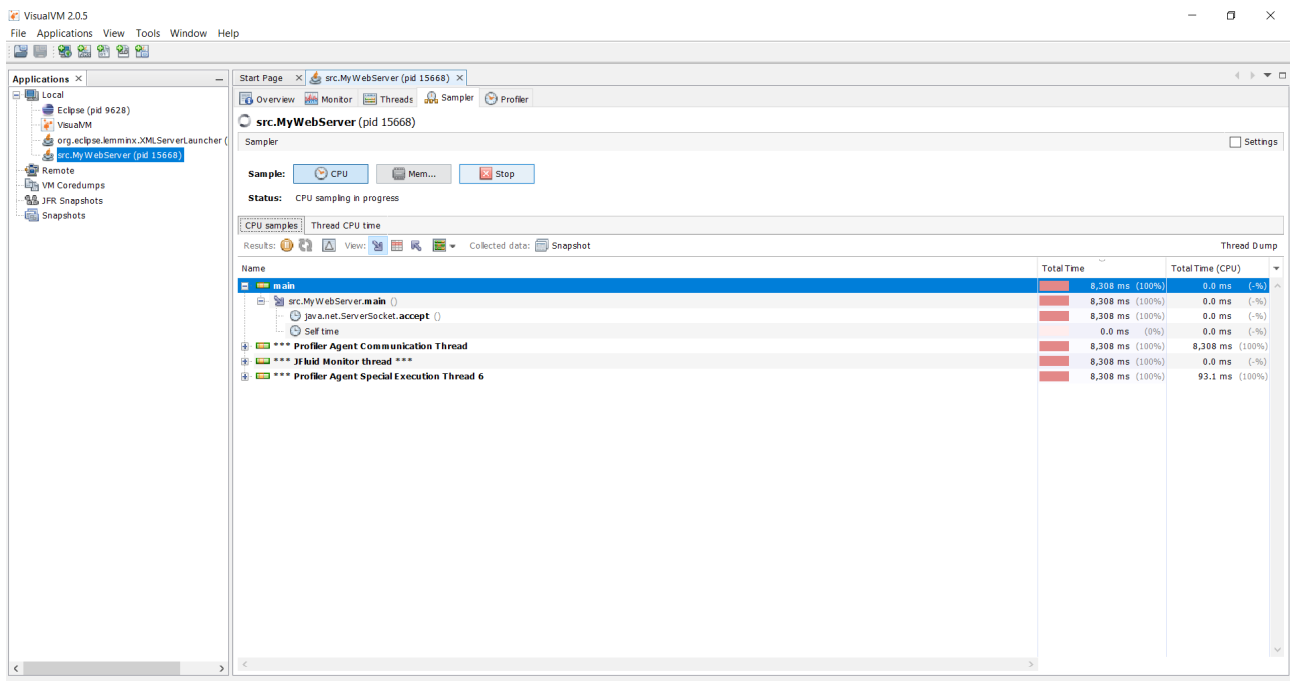
Sample: CPU Mem... Stop

Status: sampling inactive

Heap histogram Per thread allocations

Results: Collected data: Snapshot

Name	Live Bytes	Live Objects
int[]	3,395,984 B (21.3%)	2,292 (0.7%)
java.lang.Object[]	3,283,848 B (20.6%)	90,855 (27.5%)
java.util.TreeMap\$Entry	2,326,240 B (14.6%)	58,156 (17.6%)
byte[]	1,313,528 B (8.2%)	19,879 (6%)
java.io.ObjectStreamClass\$WeakClassKey	1,140,800 B (7.2%)	35,650 (10.8%)
java.lang.String	372,120 B (2.3%)	15,585 (4.7%)
java.util.TreeMap	316,800 B (2%)	6,600 (2%)
char[]	284,464 B (1.8%)	1,170 (0.4%)
java.lang.Class	276,744 B (1.7%)	2,302 (0.7%)
java.lang.StackTraceElement	265,872 B (1.7%)	5,539 (1.7%)
java.util.TreeMap\$KeyIterator	217,344 B (1.4%)	6,792 (2.1%)
java.io.Serializable\$CallbackContext	174,888 B (1.1%)	7,287 (2.2%)
java.util.HashMap\$Node	159,168 B (1%)	4,874 (1.5%)
javax.management.openmbean.CompositeDataSupport	157,728 B (1%)	6,572 (2%)
java.lang.reflect.Method	146,432 B (0.9%)	1,664 (0.5%)
java.util.TreeMap\$EntrySet	105,280 B (0.7%)	6,580 (2%)
java.util.TreeMap\$KeySet	105,200 B (0.7%)	6,575 (2%)
java.io.ObjectStreamClass	103,272 B (0.6%)	993 (0.3%)
java.util.HashMap\$Node[]	80,032 B (0.5%)	810 (0.2%)
java.lang.Integer	77,760 B (0.5%)	4,860 (1.5%)
java.lang.management.ThreadInfo	75,504 B (0.5%)	726 (0.2%)
java.util.concurrent.ConcurrentHashMap\$Node	72,864 B (0.5%)	2,277 (0.7%)
java.lang.StackTraceElement[]	70,584 B (0.4%)	1,445 (0.4%)
javax.management.openmbean.CompositeData[]	62,880 B (0.4%)	2,244 (0.7%)
java.lang.Class[]	61,688 B (0.4%)	2,550 (0.8%)
java.util.HashMap	55,536 B (0.3%)	1,157 (0.4%)



Pentru testarea web a paginii principale index.html am folosit Selenium IDE. Acesta este conceput pentru a înregistra interacțiunile cu site-urile web pentru a ne ajuta să generăm și să menținem automatizarea site-ului, să testăm și să eliminăm necesitatea de a trece manual prin preluări repetitive.

Selenium IDE - webservice

Project: webservice

Tests +

Search tests...

get_about_page

get_menu_page

http://localhost:8080/index.html

	Command	Target	Value
1	open	http://localhost:8080/index.html	
2	set window size	826x824	
3	click	linkText=Menu	

Command

Target

Value

Description

Log

Reference

Selenium IDE - webservice

Project: webservice

Tests +

Search tests...

get_about_page

get_menu_page

http://localhost:8080/index.html

	Command	Target	Value
1	open	http://localhost:8080/index.html	
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3	click	linkText=Menu	

Command

Target

Value

Description

Log

Reference

Selenium IDE - webserver

Project: webserver

Tests +

Search tests...

get_about_page

get_contact_page

get_menu_page

http://localhost:8080/index.html

	Command	Target	Value
1	open	http://localhost:8080/index.html	
2	set window size	828x824	
3	click	linkText=Contact	

Command

Target

Value

Description

LogReference

Selenium IDE - webserver

Project: webserver

Tests +

Search tests...

fill_contact_form

get_about_page

get_contact_page

get_menu_page

http://localhost:8080/index.html

	Command	Target	Value
1	open	http://localhost:8080/index.html	
2	set window size	828x824	
3	click	linkText=Contact	
4	click	name=Name	
5	type	name=Name	Iulian Paul
6	click	name=People	
7	type	name=People	2
8	click	name=date	
9	type	name=date	2020-11-20T20:00

Command

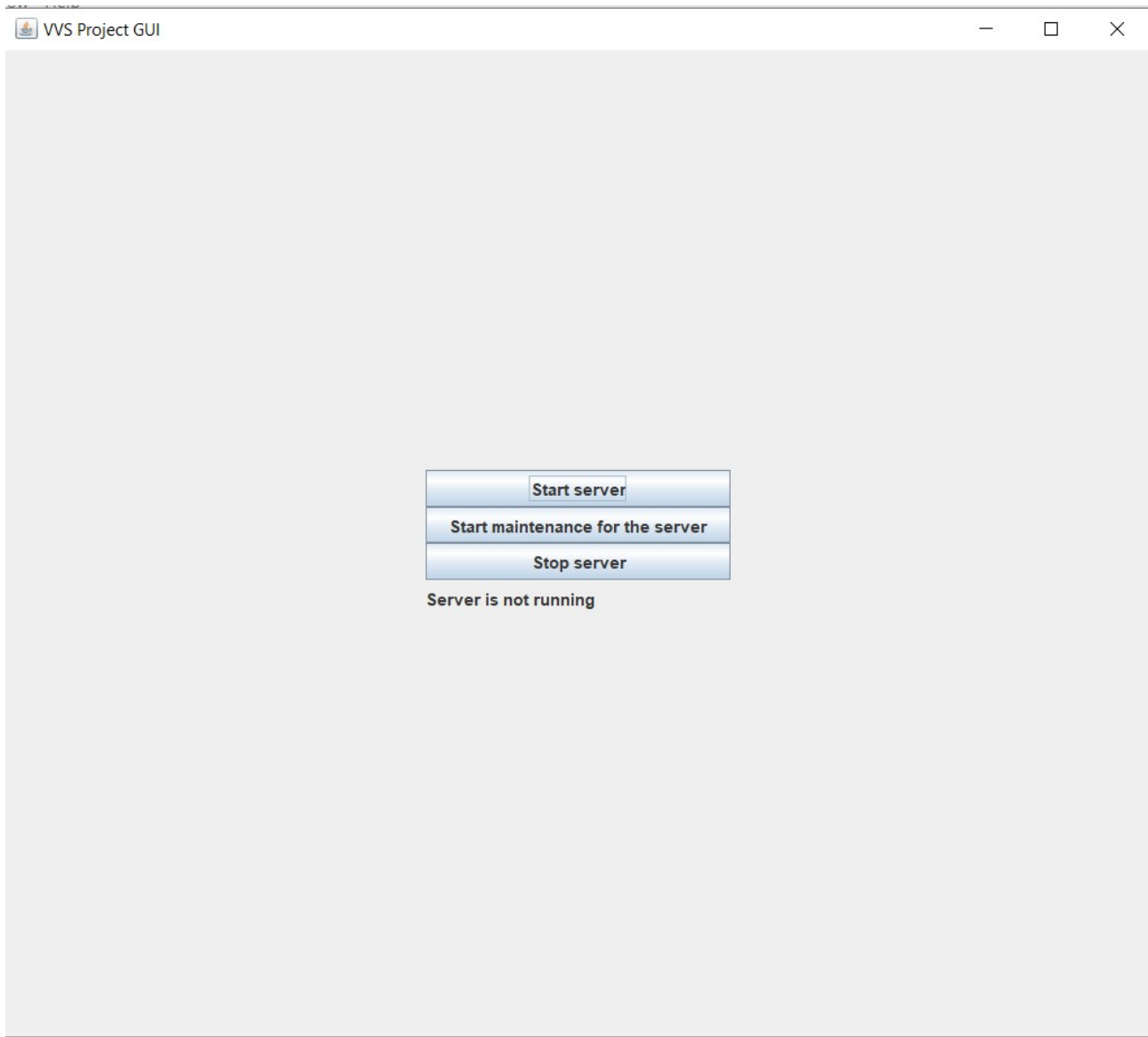
Target

Value

Description

LogReference

Interfata grafica(GUI):



Bibliografie:

- 1) <https://ssaurel.medium.com/create-a-simple-http-web-server-in-java-3fc12b29d5fd>
– scheletul principal al proiectului
- 2) https://www.youtube.com/watch?v=LJjIaCKuzoc&feature=emb_title
- 3) <https://docs.oracle.com/javase/tutorial/networking/urls/connecting.html>
- 4) <https://stackoverflow.com>