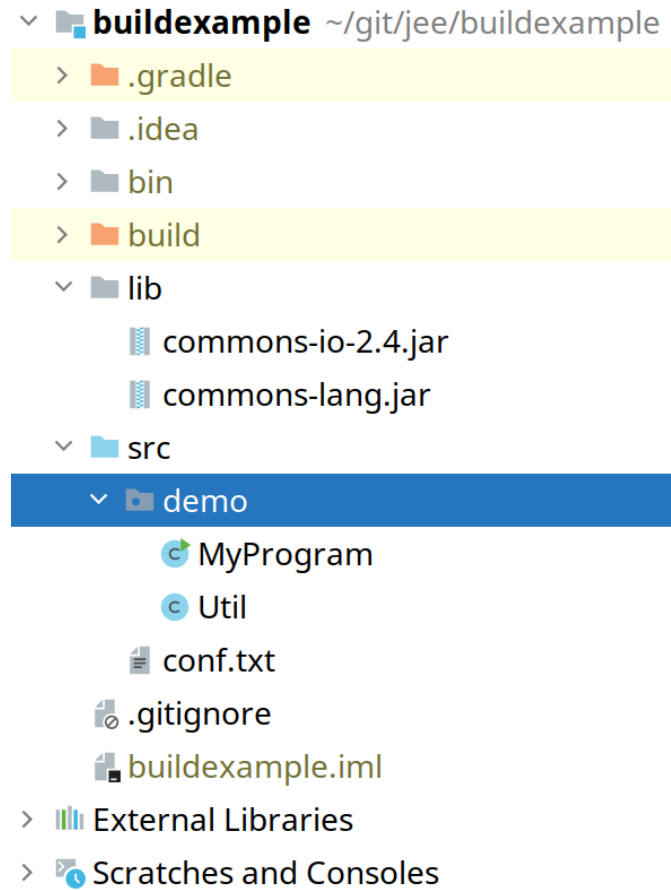


Loeng 2

Projekti ehitamine

Lähtekood vs programm



Java (pakendamine)

hello.war

```
`-- WEB-INF/  
    |-- classes/  
    |    |-- hello  
    |    |-- Hello.class  
    |-- lib/  
    |-- web.xml
```

Projekti ehitamine

- IDEA ei ole sobilik, ega piisav

Projekti ehitamine

- IDEA ei ole sobilik, ega piisav
- Projekti ehitamine peaks olema automaatne
 - näide: kodutööde hindamissüsteem

Java koodi kompileerimine

*.java → *.class

Teegid (*.jar)

- Java teegid on jar laiendiga.
- Jar on class failide kogum zip-iga kokku pakitud.
- Mingi osa Java-ga kaasas (nt. `java.util.List`)
- Ülejäänud tuleb ise lisada.

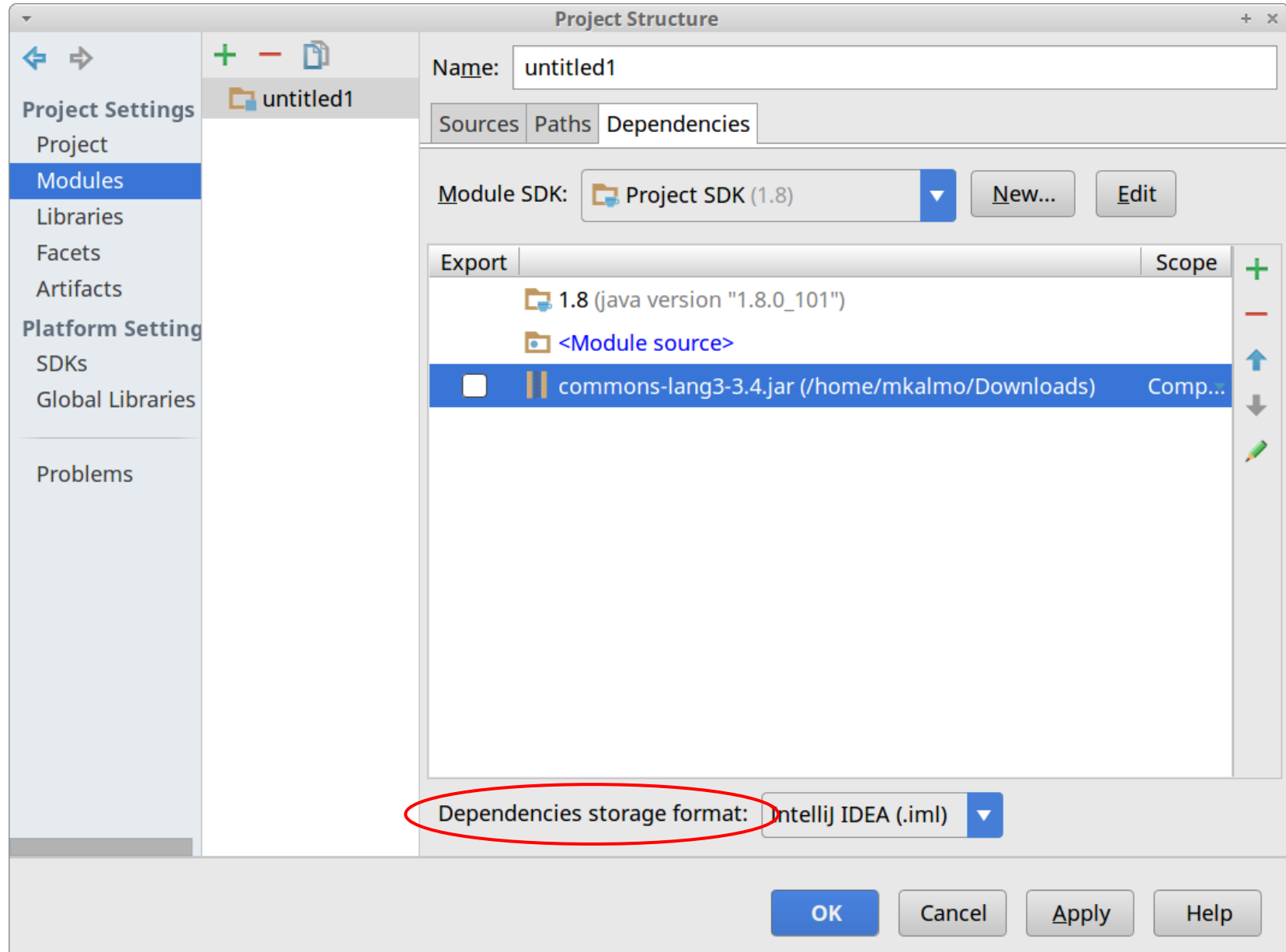
Teegid käsurealt

> javac -cp c:/libs/myLib.jar Hello.java

> java -cp c:/libs/myLib.jar;. Hello # (win)

> java -cp c:/libs/myLib.jar:. Hello # (mac)

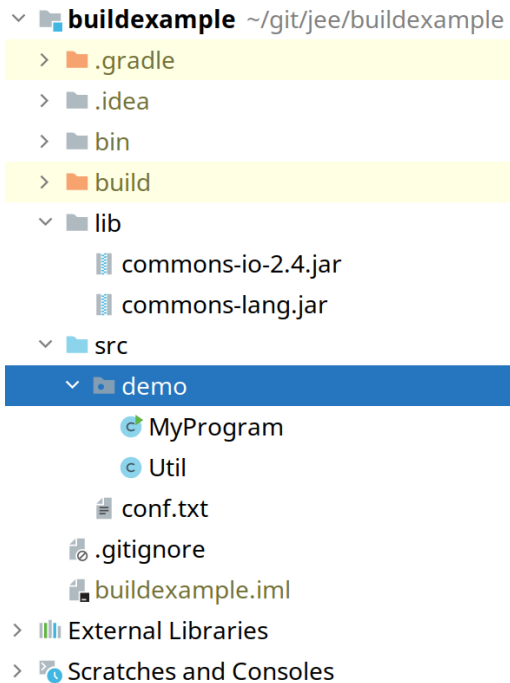
Sõltuvused teekidest IDEA-s



Sõltuvused teekidest IDEA-s

- .idea
- project.iml

Sõltuvused teekidest IDEA-s

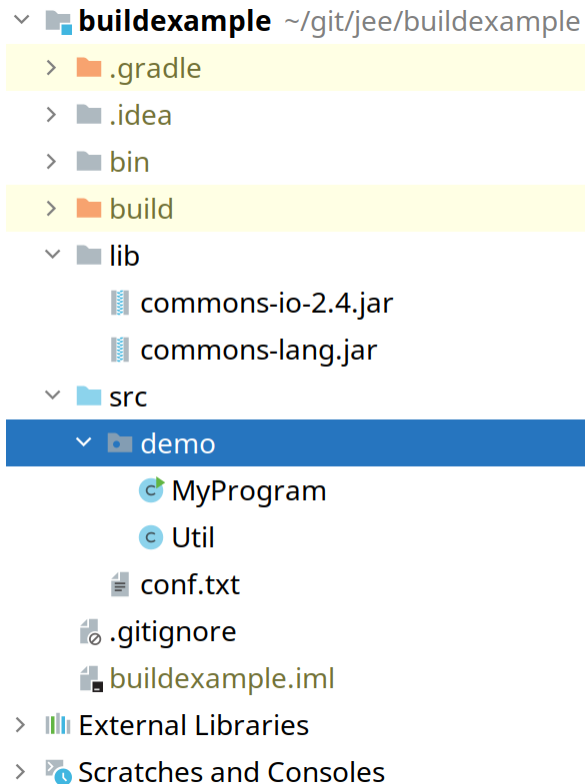


```
javac -cp ... MyProgram.java
```

```
5  ▶ public class MyProgram {  
6  
7  ▶ public static void main(String[] args)  
8
```

```
java -cp ... MyProgram
```

Projekti ehitamine



myprogram.jar

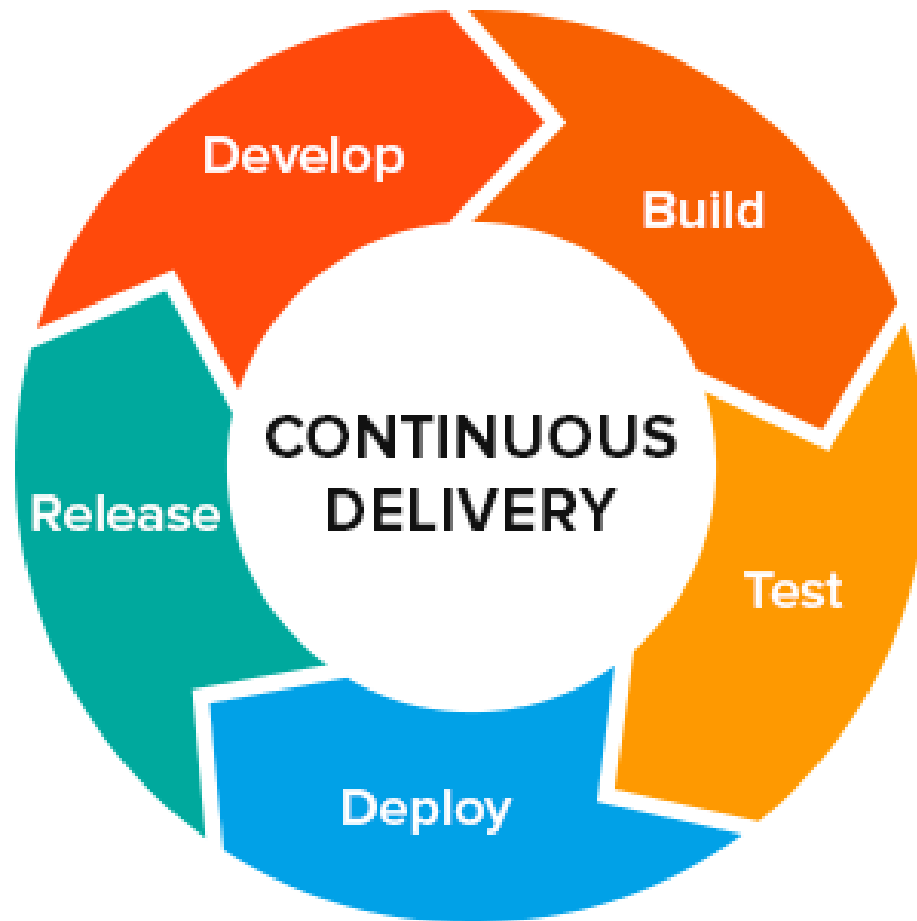
> java -jar myprogram.jar

Projekti ehitamine


- Kompileerimine
- Failide transformeerimine ja kopeerimine
- Automaattestimine
- Dokumentatsiooni koostamine (Javadoc, näited)
- Kataloogistruktuuri moodustamine
- Paki loomine (nt. jar, war, ear, exe, msi, deb)
- Jne.

Lisaks erinevad konfiguratsioonid

Kaugem eesmärk (CI, CD)




Jenkins













 **Jenkins**

[Jenkins](#) > [freestyle-multi-branch](#) > [ENABLE AUTO REFRESH](#)




[Up](#)
[Status](#)
[Configure](#)
[Branch Indexing](#)
[Delete Project](#)
[People](#)
[Build History](#)
[Edit View](#)
[Move](#)
[Job Config History](#)
[Credentials](#)

 **freestyle-multi-branch**
[add description](#)
[Disable Project](#)

All +

S	W	Name ↓	Last Success	Last Failure	Last Duration
		development	36 sec - #3	N/A	31 sec 
		feature/cool-stuff	1 min 10 sec - #2	N/A	30 sec 
		master	3 min 22 sec - #11	N/A	31 sec 
		stable	39 sec - #2	N/A	30 sec 


Icon: [S](#) [M](#) [L](#)

[Legend](#)  [RSS for all](#)  [RSS for failures](#)  [RSS for just latest builds](#)

Build Queue

No builds in the queue.

Build Executor Status

1 [freestyle-multi-branch »](#)
[development](#) [#4](#) 

2 Idle

Kaugem eesmärk

- Esimesel tööpäeval töö live-i panemine

Kompileerimine

- Kus asub lähtekood?
- Kus asuvad teegid?
- Kuhu läheb kompileeritud kood?

Projekti ehitamine (hüpoteetiline)

```
import tld.company.buildtools.Compiler;
...

public class Builder {

    public static void main(String[] args) {

        Compiler c = new Compiler();

        c.addSourceDir("src");
        c.addBuildDir("bin");
        c.addLibDir("lib");

        c.compileJava();
    }
}
```

Projekti ehitamine (hüpoteetiline)

conf.json

```
{  
  "sourceDir": "src",  
  "buildDir": "bin",  
  "libDir": "libs",  
  ...  
}
```

./builder.exe conf.json

Domain Specific Language (DSL)

- Piiratud funktsionaalsusega keel konkreetse eesmärgi saavutamiseks
- Mitte üldkasutatav (general purpose)
- Näited: SQL, VHDL, RegEx jne...

Ehitamise tööriistad Java jaoks



maven



Aeg



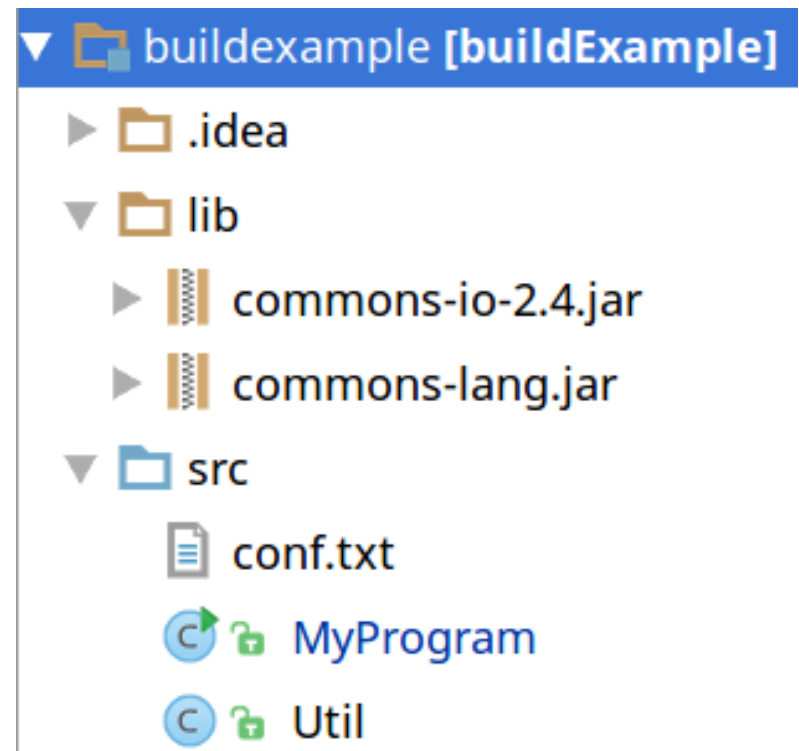
Gradle

- <https://gradle.org/>
- Tööriist Java projektide ehitamiseks
- Ehitab vastavalt build.gradle failis olevale juhisele (käivitab koodi failist build.gradle).
- Vajab oma tööks Java SDK-d

Build script

- Määrtata lähtekoodi kataloog
- Määrata kompileeritud koodi kataloog
- Määrata teekide asukoht
- Kompileerida
- Kopeerida failid
- Koostada pakk (jar)

> java -jar myProg.jar

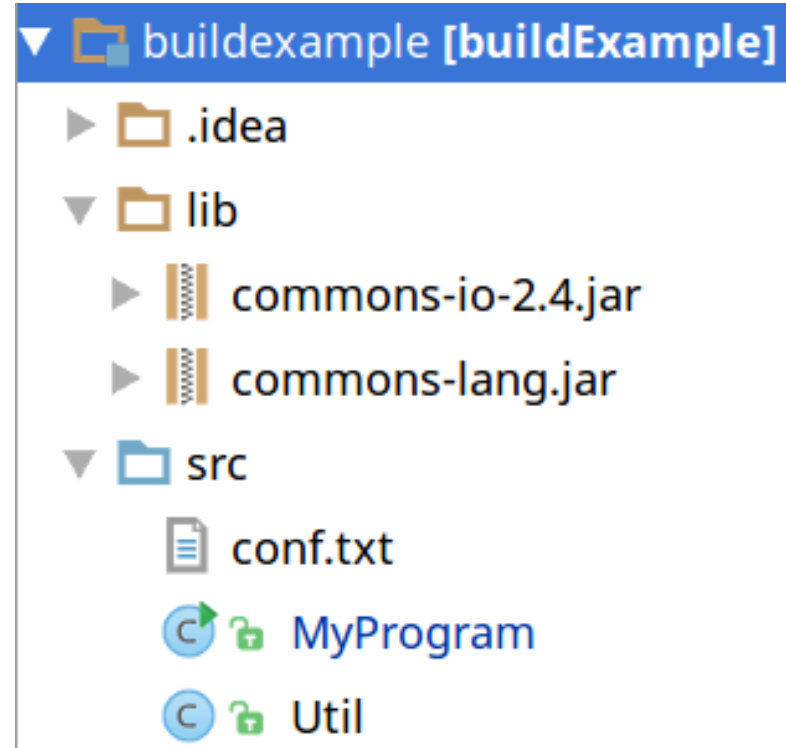


Demo

- Gradle

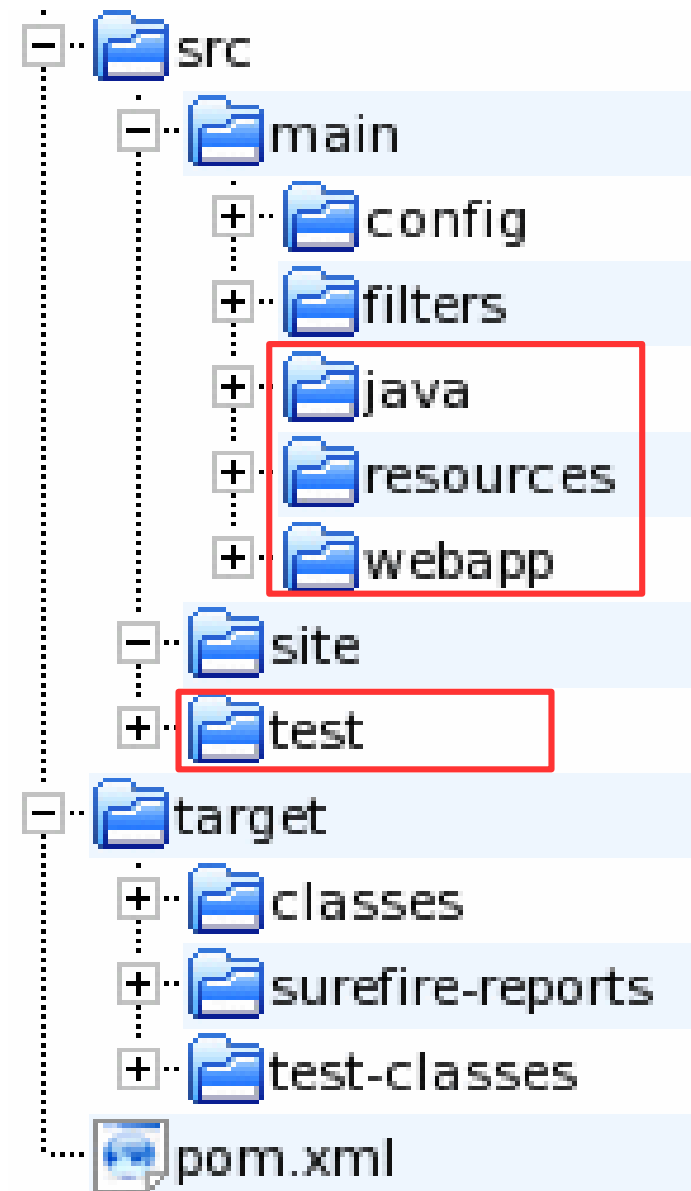
Gradle build script (build.gradle)

```
plugins {  
    id 'java'  
}  
  
def sourceDir = file('src')  
def libDir = file('lib')  
def classesDir = file('klassid')  
  
compileJava {  
    source = sourceDir  
    destinationDir = classesDir  
    classpath = files { libDir.listFiles() }  
}  
  
...
```



Gradle / Maven

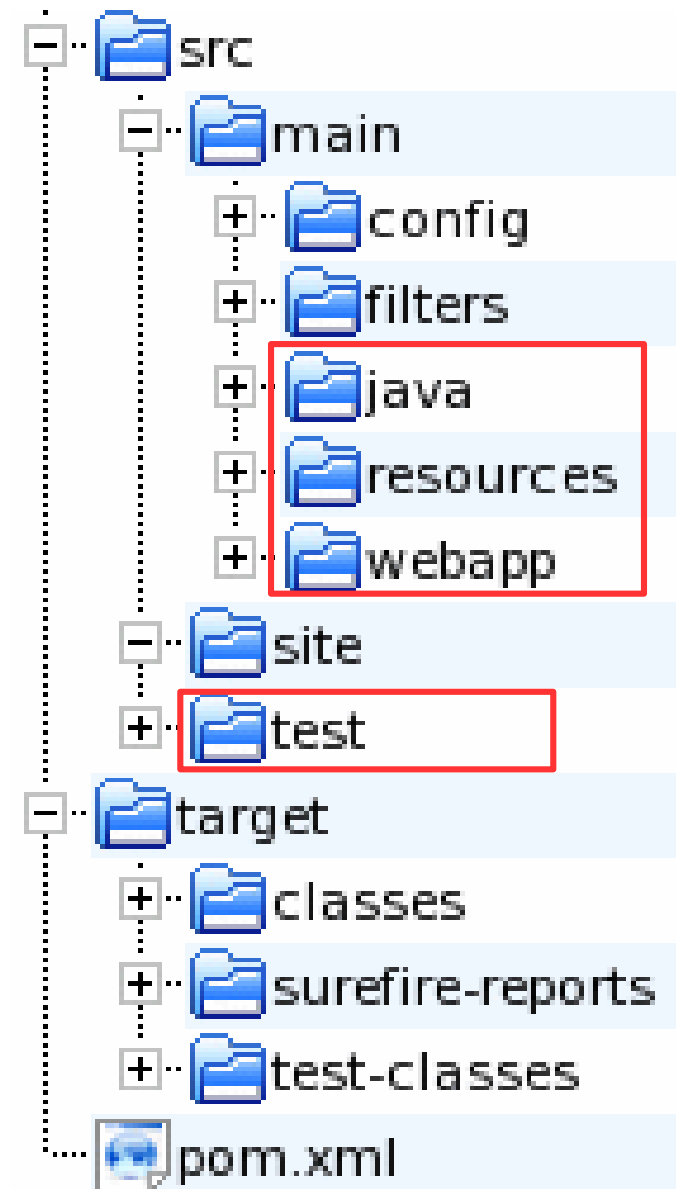
- Convention over configuration



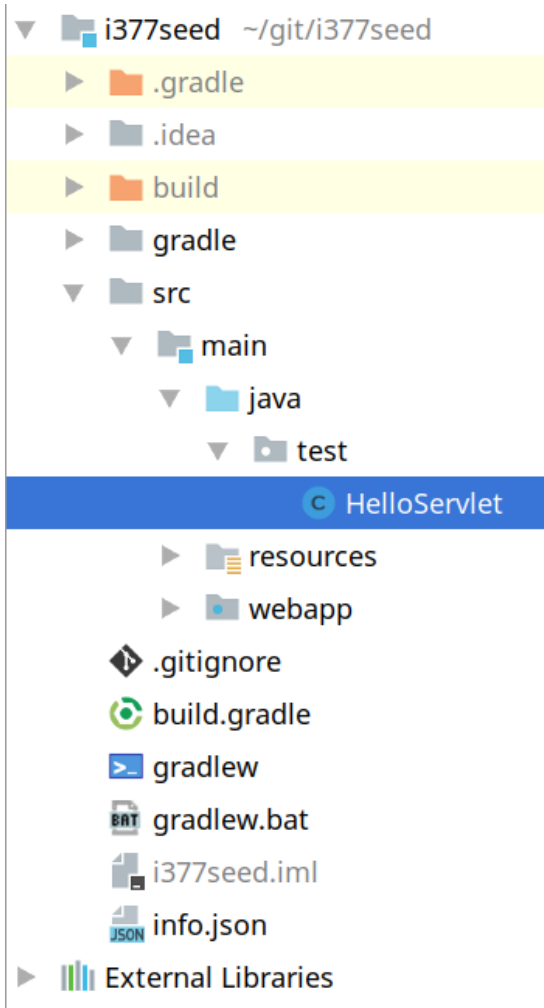
Gradle build script (build.gradle)

```
plugins {  
    id 'java'  
}
```

```
jar {  
    manifest {  
        attributes 'Main-Class...'  
    }  
}
```



Gradle osa projektis



hello.war

`-- WEB-INF/

`-- classes/

`-- test

`-- [HelloServlet.class](#)

Gradle osa projektis

- Juhis (build.gradle), mille kohaselt ehitatakse war fail.
 - Tõmbab vajalikud teegid
 - Kompileerib koodi
 - Kopeerib konfiguratsiooni failid
 - Teeb paketi (war) või käivitab rakenduse

> git clone <url> && cd <dir> && gradle war

> git clone <url> && cd <dir> && gradle appRun

Java EE

```
package hello;
```

```
import java.io.IOException;
```

```
import javax.servlet.ServletException;
```

```
import javax.servlet.annotation.WebServlet;
```

```
import javax.servlet.http.HttpServlet;
```

```
import javax.servlet.http.HttpServletRequest;
```

```
import javax.servlet.http.HttpServletResponse;
```

```
@WebServlet("hello")
```

```
public class HelloServlet extends HttpServlet {
```

```
    @Override
```

```
    protected void doGet(HttpServletRequest request,  
                          HttpServletResponse response)
```

```
        throws IOException {
```

```
        response.getWriter().println("Hello!");
```

```
    }
```

```
}
```

Kataloogistruktuur

> gradle init

build.gradle

- Tõmbab vajalikud teegid

```
repositories {  
    jcenter()  
}
```

```
dependencies {  
    compileOnly 'javax.servlet:javax.servlet-api:4.0.1'  
}
```


Sõltuvuse skoop

- compileOnly – nähtav kompileerimisel
- implementation – nähtav kompileerimisel ja käivitamisel (varem „compile”)
- ...

Teegid käsurealt

> `javac -cp c:/libs/myLib.jar Hello.java`

> `java -cp c:/libs/myLib.jar;. Hello`

Sõltuvuste formaat

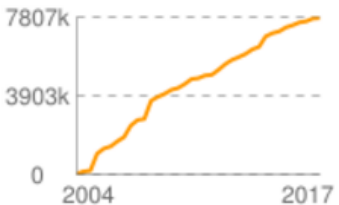
implementation 'com.fasterxml.jackson.core:jackson-databind:...

implementation group: 'com.fasterxml.jackson.core',
name: 'jackson-databind',
version: '2.11.2'

Sõltuvuste repositoorium

Maven Repository: x


Secure | https://mvnrepository.com/artifact/com.fasterxml.jackson.core/jackson-databind/2.9.1

Indexed Artifacts (7.81M)


Popular Categories

- Aspect Oriented
- Actor Frameworks
- Application Metrics
- Build Tools
- Bytecode Libraries
- Command Line Parsers
- Cache Implementations
- Cloud Computing
- Code Analyzers
- Collections
- Configuration Libraries
- Core Utilities
- Date and Time Utilities
- Dependency Injection

Home » com.fasterxml.jackson.core » jackson-databind » 2.9.1

**Jackson Databind » 2.9.1**

General data-binding functionality for Jackson: works on core streaming API

License	Apache 2.0
Categories	JSON Libraries
HomePage	http://github.com/FasterXML/jackson
Date	(Sep 08, 2017)
Files	Download (BUNDLE) (1.3 MB)
Repositories	Central
Used By	6,520 artifacts

Maven

Gradle

SBT

Ivy

Grape

Leiningen

Buildr

```
compile group: 'com.fasterxml.jackson.core', name: 'jackson-databind', version: '2.9.1'
```

☐ Include comment with link to declaration

Popular Tags

android apache api application archetype assets build build-system client clojure cloud codehaus config database eclipse example extension github groovy gwt http ide io jboss json library logging maven module netbeans osgi persistence platform plugin rest scala sdk security server service spring streaming testing tools ui web web-framework webapp webserver xml

Web site developed by @frodriguez

Powered by: Scala, Play, Spark, Akka and Cassandra

war pakett

```
plugins {  
    id 'war'  
}
```

```
> gradle war
```

Veebiserver

```
plugins {  
    id 'org.gretty' version '3.0.3'  
}
```

> gradle appRun

Veebiserveri konfigureerimine

```
gretty {  
    contextPath = '/'  
}
```

Vaikimisi: <http://localhost:8080/<projekti nimi>>

Java versioon kompileerimisel

sourceCompatibility = 11

Muutujad

```
def commonsVersion = '3.8'
```

```
dependencies {
```

```
    implementation group: 'org.apache.commons',  
                    name: 'commons-lang3',  
                    version: commonsVersion
```

Gradle wrapper

> gradle wrapper

gradle/wrapper/gradle-wrapper.jar


gradle/wrapper/gradle-wrapper.properties

gradlew

gradlew.bat


Gradle wrapper


▼  exservlet [jee.exservlet] ~/git/jee/exservlet


>  .gradle

>  .idea

>  build

▼  gradle


▼  wrapper

 gradle-wrapper.jar


 gradle-wrapper.properties


>  out

>  src


 .gitignore

 build.gradle

>  gradlew

 gradlew.bat

>  External Libraries

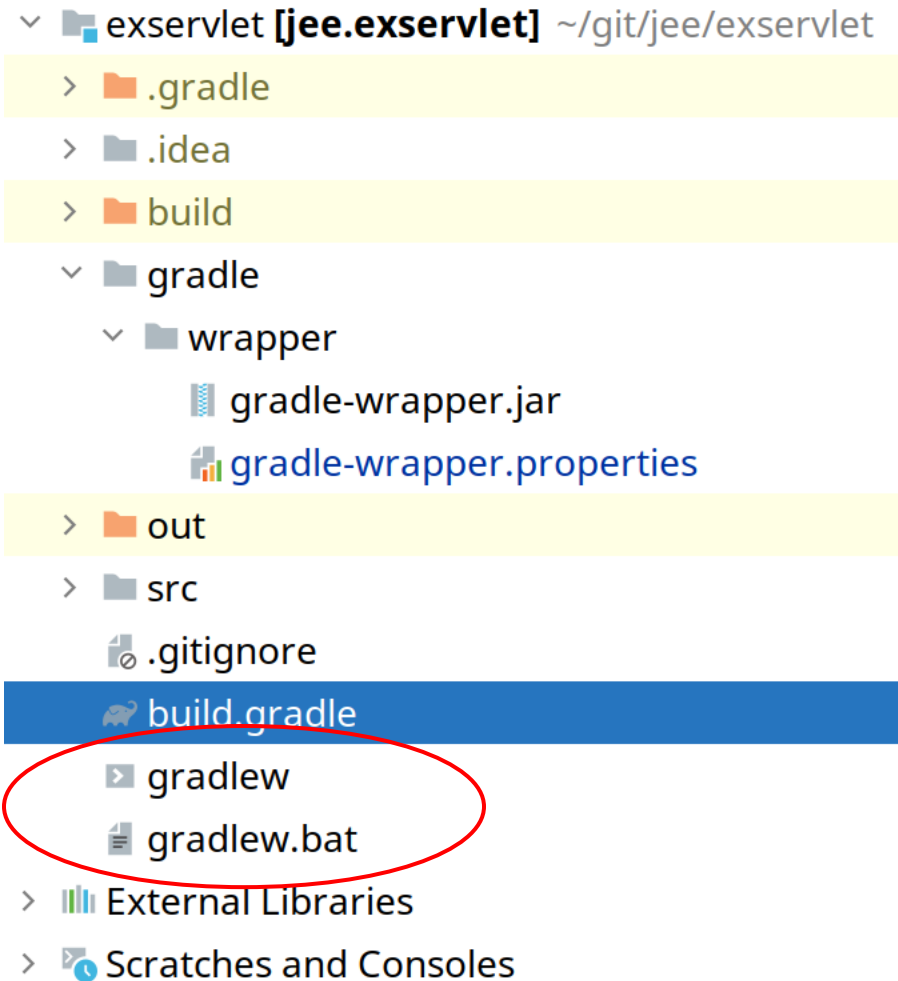
>  Scratches and Consoles

Gradle wrapper

> gradle appRun

> gradlew.bat appRun

> ./gradlew appRun



gradle-wrapper.properties

```
distributionBase=GRADLE_USER_HOME  
distributionPath=wrapper/dists  
distributionUrl=https\://.../gradle-6.6.1-bin.zip  
zipStoreBase=GRADLE_USER_HOME  
zipStorePath=wrapper/dists
```

Java koodi Käivitamine läbi Gradle

build.gradle

```
task runMyCode(type: JavaExec) {  
    main = 'exservlet.JsonConverter'  
    classpath = sourceSets.main.runtimeClasspath  
}
```

> gradle runMyCode

.gitignore

.idea
*.iml

*.class
*.jar
*.war

!/gradle/wrapper/gradle-wrapper.jar

Vahemälu

<user home>/gradle

<user home>/m2

<project home>/build

Vahemälu puhastamine

<user home>/gradle

kustutada

<user home>/m2

kustutada

<project home>/build

> gradle clean

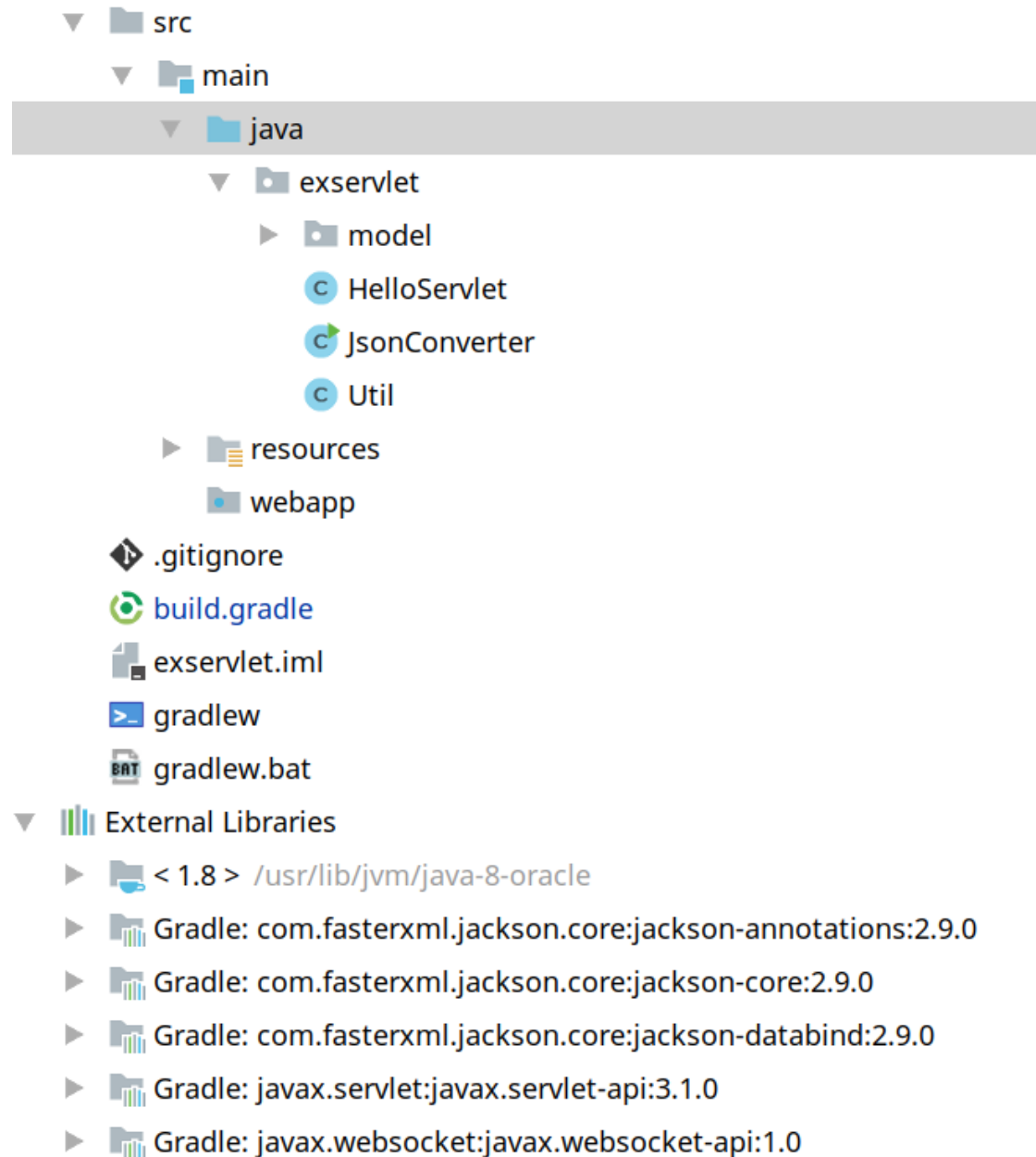
Gradle daemon

Uus Gradle projekt Idea-st

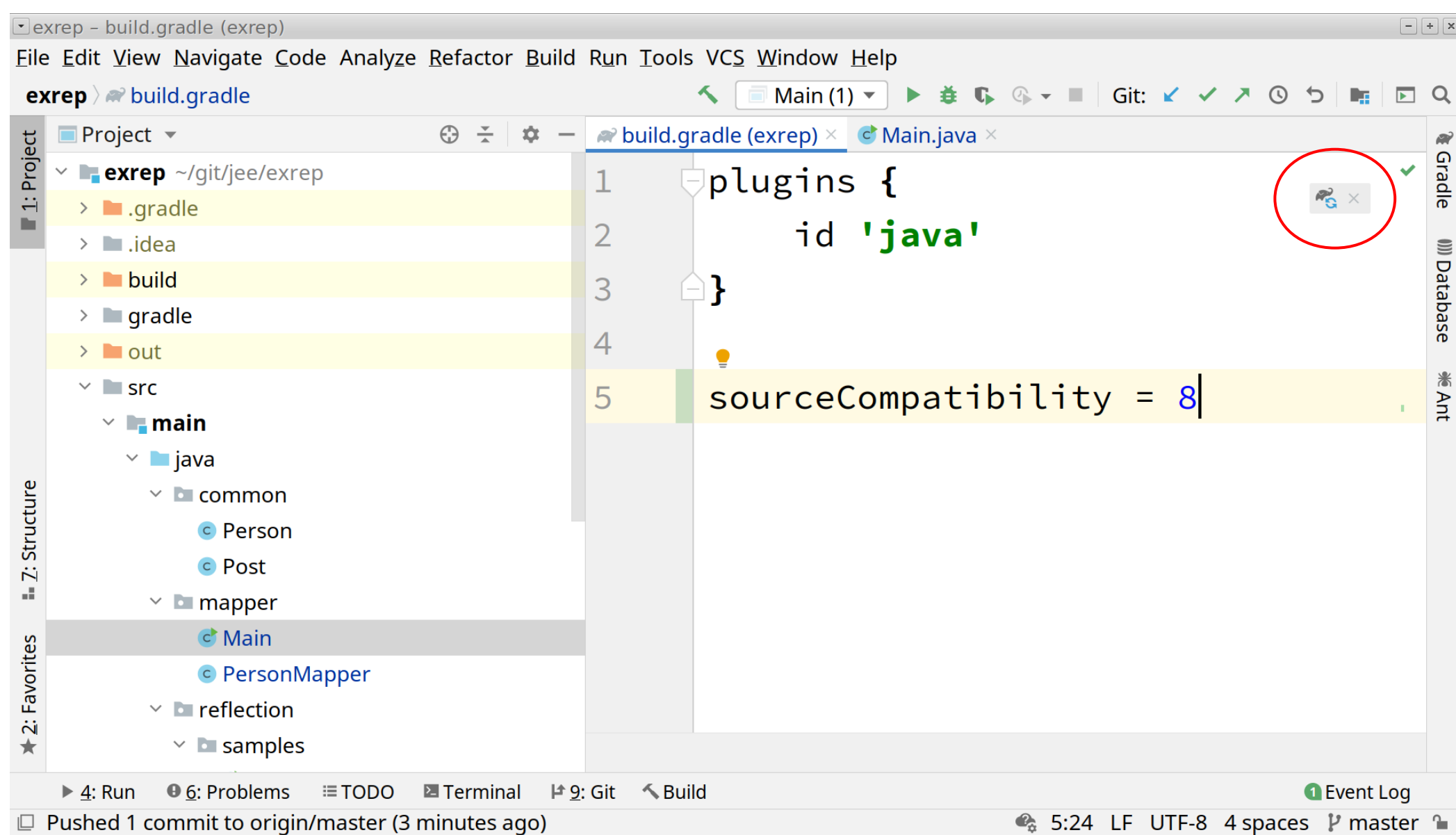
Gradle struktuur IDEA-s

- build.gradle vs .idea ja *.iml

Gradle structuur IDEA-s



build.gradle muudatused IDEA-s



Gradle

- Väga paindlik
- Pidevas muutumises
- Kehvem tööristade toetus, kui Maven-il

Maven (pros)

- Küllaltki paindumatu
- „Õigete” lahenduste leidmine on lihtsam
- Vähem probleeme

Maven (cons)

- Küllaltki paindumatu
- Raskesti laiendatav

Projekti 2. osa

- Tähtaeg 13. september (22:00)

Projekti 2. osa

- Projekti ehitamise skripti loomine
- skript (build.gradle)
- kataloogistruktuur
- gradle wrapper failid
- Hello servlet (ette antud)

HelloServlet.java

...

```
@WebServlet("/hello")
public class HelloServlet extends HttpServlet {

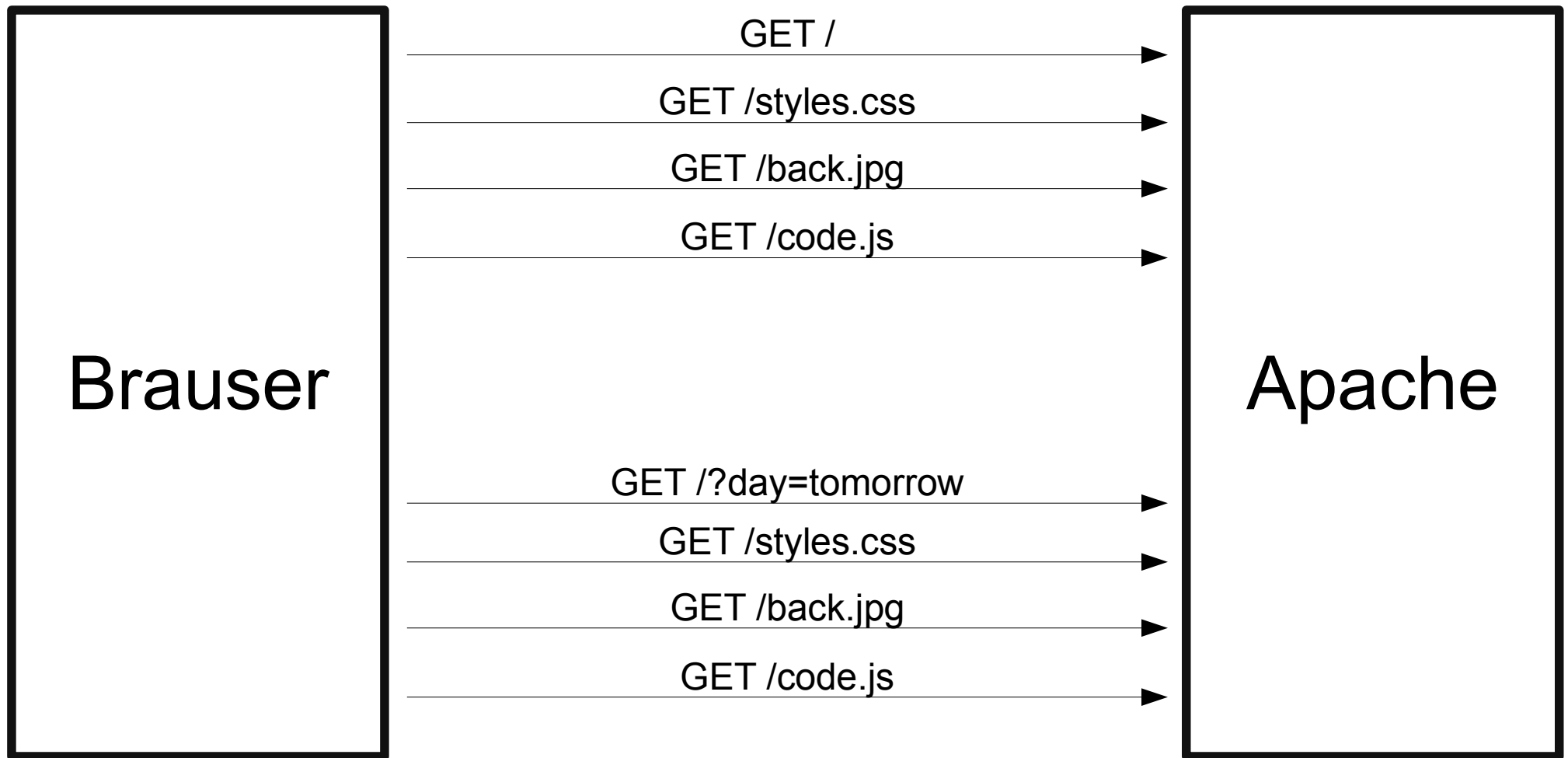
    @Override
    public void doGet(HttpServletRequest request,
                      HttpServletResponse response)
        throws IOException {

        response.setContentType("application/json");

        response.getWriter().print("{}");

    }
}
```

Html-i genereerimine serveris



Php + JavaScript

