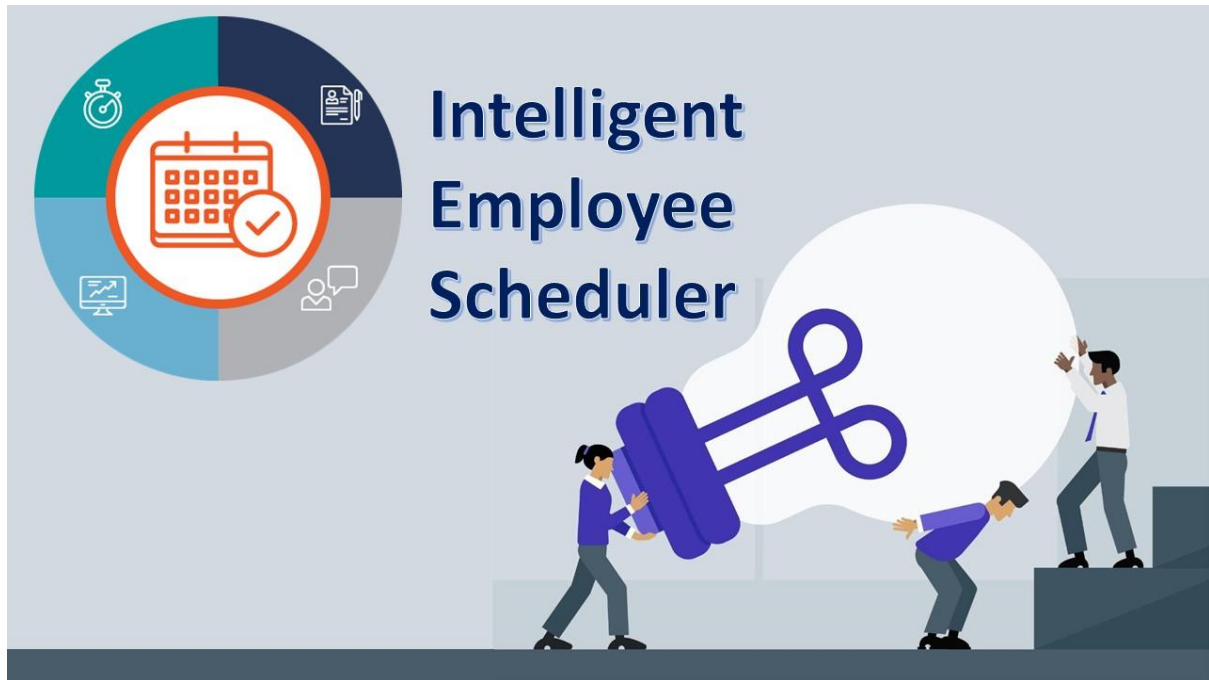


Intelligent Employee Scheduler (LTA MRT)

Environment set up for [iss-vm](#)



< Back End Sub-system >

1. Start backend service, you can navigate to the `/IRS-RS-2019-03-09-IS1PT-GRP-2-GOH-Intelligent_Employee_Scheduler/SystemCode/services` folder and enter

`mvn clean install`

```
iss-user@iss-vm: ~/iss-vm-program/iss-intelligent-reasoning-systems/git-IRS-RS/2/IRS-RS-2019-03-09-IS1PT-GRP-2-GOH-Intellige... x
-2hard/sof
JobAssignment:JobAssignment [logger=Logger[JobAssignment], employee=Employee [name=B, employeeID=200, employeeGrade=2, preferredLocation=5], job=Job [jobID=1, jobLocation=1, shift=1]]
JobAssignment:JobAssignment [logger=Logger[JobAssignment], employee=Employee [name=C, employeeID=300, employeeGrade=3, preferredLocation=5], job=Job [jobID=2, jobLocation=1, shift=1]]
JobAssignment:JobAssignment [logger=Logger[JobAssignment], employee=Employee [name=A, employeeID=100, employeeGrade=1, preferredLocation=1], job=Job [jobID=3, jobLocation=3, shift=5]]
Hardscore:-2
Softscore:0
-2hard/sof
2019-05-15 10:45:25.479 [main] DEBUG LS step (1), time spent (2015), score (-2hard/sof), best score (0hard/sof), accepted/selected move count (626/3554), picked move (JobAssignment [logger=Log
ger[JobAssignment], employee=Employee [name=A, employeeID=100, employeeGrade=1, preferredLocation=1], shiftAvailability=[0, 1]] -> Employee [name=B, employeeID=200, employeeGrade=2, preferredLocation=5], shiftAvailability=[2, 3, 5]]).
2019-05-15 10:45:25.479 [main] INFO Local Search phase (1) ended: time spent (2015), best score (0hard/sof), score calculation speed (2231/sec), step total (2).
2019-05-15 10:45:25.479 [main] INFO Solving ended: time spent (2015), best score (0hard/sof), score calculation speed (2162/sec), phase total (2), environment mode (REPRODUCIBLE).
Best Score:(Hard 0, Soft 1)
After solving schedule.....
JobID: 1, Shift: 1, Location: 1, Employee: A
JobID: 2, Shift: 1, Location: 1, Employee: C
JobID: 3, Shift: 5, Location: 3, Employee: B
[INFO] Tests run: 1, Failures: 0, Errors: 0, Skipped: 0, Time elapsed: 3.844 s - in com.lrs.roster.OptaplannerUnitTest
[INFO] Results:
[INFO] Tests run: 1, Failures: 0, Errors: 0, Skipped: 0
[INFO]
[INFO] --- maven-jar-plugin:3.1.1:jar (default-jar) @ services ---
[INFO] Building jar: /home/iss-user/iss-vm-program/iss-intelligent-reasoning-systems/git-IRS-RS/2/IRS-RS-2019-03-09-IS1PT-GRP-2-GOH-Intelligent_Employee_Scheduler/services/target/services-0.0.1-SNAPSHOT.jar
[INFO]
[INFO] --- spring-boot-maven-plugin:2.1.4.RELEASE:repackage (repackage) @ services ---
Downloaded: https://repo.maven.apache.org/maven2/org/springframework/boot/spring-boot-loader-tools/2.1.4.RELEASE/spring-boot-loader-tools-2.1.4.RELEASE.pom (3 KB at 7.3 KB/sec)
Downloaded: https://repo.maven.apache.org/maven2/org/springframework/boot/spring-boot-loader-tools/2.1.4.RELEASE/spring-boot-loader-tools-2.1.4.RELEASE.jar (146 KB at 343.0 KB/sec)
[INFO] Replacing main artifact with repackaged archive
[INFO]
[INFO] --- maven-install-plugin:2.5.2:install (default-install) @ services ---
[INFO] Installing /home/iss-user/iss-vm-program/iss-intelligent-reasoning-systems/git-IRS-RS/2/IRS-RS-2019-03-09-IS1PT-GRP-2-GOH-Intelligent_Employee_Scheduler/services/target/services-0.0.1-SNAPSHOT.jar to
/home/iss-user/.m2/repository/com/anitime/services/0.0.1-SNAPSHOT/services-0.0.1-SNAPSHOT.jar
[INFO] Installing /home/iss-user/iss-vm-program/iss-intelligent-reasoning-systems/git-IRS-RS/2/IRS-RS-2019-03-09-IS1PT-GRP-2-GOH-Intelligent_Employee_Scheduler/services/pon.xml to /home/iss-user/.m2/reposi
tory/com/anitime/services/0.0.1-SNAPSHOT/services-0.0.1-SNAPSHOT.pom
[INFO] BUILD SUCCESS
[INFO] Total time: 01:18 min
[INFO] Finished at: 2019-05-15T10:45:29+08:00
[INFO] Final Memory: 51M/477M
[INFO]
iss-user@iss-vm: /iss-vm-program/iss-intelligent-reasoning-systems/git-IRS-RS/2/IRS-RS-2019-03-09-IS1PT-GRP-2-GOH-Intelligent_Employee_Scheduler/services$
```

mvn spring-boot:run

```
iss-user@iss-vim: ~/iss-vim-program/iss-intelligent-reasoning-systems/glt-IRS-RS/2/IRS-RS-2019-03-09-ISIPT-GRP-2-GOH-Intellige...  
[INFO] -----  
[INFO] BUILD SUCCESS  
[INFO] -----  
[INFO] Total time: 01:18 min  
[INFO] Finished at: 2019-05-15T10:45:29+08:00  
[INFO] Final Memory: 51M/477M  
[INFO] -----  
iss-user@iss-vim: ~/iss-vim-program/iss-intelligent-reasoning-systems/glt-IRS-RS/2/IRS-RS-2019-03-09-ISIPT-GRP-2-GOH-Intelligence...$ mvn spring-boot:run  
[INFO] Scanning for projects...  
[INFO] Building services 0.0.1-SNAPSHOT  
[INFO] -----  
[INFO] >>> spring-boot-maven-plugin:2.1.4.RELEASE:run (default-cli) > test-compile @ services >>>  
[INFO] -----  
[INFO] --- maven-resources-plugin:3.1.0:resources (default-resources) @ services ---  
[INFO] Using 'UTF-8' encoding to copy filtered resources.  
[INFO] Copying 1 resource  
[INFO] Copying 5 resources  
[INFO] -----  
[INFO] --- maven-compiler-plugin:3.8.0:compile (default-compile) @ services ---  
[INFO] Nothing to compile - all classes are up to date  
[INFO] -----  
[INFO] --- maven-resources-plugin:3.1.0:testResources (default-testResources) @ services ---  
[INFO] Using 'UTF-8' encoding to copy filtered resources.  
[INFO] skip non existing resourceDirectory /home/iss-user/iss-vim-program/iss-intelligent-reasoning-systems/glt-IRS-RS/2/IRS-RS-2019-03-09-ISIPT-GRP-2-GOH-Intelligent_Employee_Scheduler/services/src/test/re  
sources  
[INFO] -----  
[INFO] --- maven-compiler-plugin:3.8.0:testCompile (default-testCompile) @ services ---  
[INFO] Nothing to compile - all classes are up to date  
[INFO] -----  
[INFO] <<< spring-boot-maven-plugin:2.1.4.RELEASE:run (default-cli) < test-compile @ services <<<  
[INFO] -----  
[INFO] --- spring-boot-maven-plugin:2.1.4.RELEASE:run (default-cli) @ services ---  
Starting RosterPlanner.  
2019-05-15 10:53:38.105 [main] DEBUG Application started with classpath: [file:/home/iss-user/iss-vim-program/iss-intelligent-reasoning-systems/glt-IRS-RS/2/IRS-RS-2019-03-09-ISIPT-GRP-2-GOH-Intelligent_Emp  
loyee_Scheduler/services/target/classes/, file:/home/iss-user/.m2/repository/org/springframework/boot/spring-boot-starter-data-jpa/2.1.4.RELEASE/spring-boot-starter-data-jpa-2.1.4.RELEASE.jar, file:/home/  
iss-user/.m2/repository/org/springframework/boot/spring-boot-starter-actuator/2.1.4.RELEASE/spring-boot-starter-actuator-2.1.4.RELEASE.jar, file:/home/iss-user/.m2/repository/org/springframework/spring-aop/5.1.6.RE  
LEASE/spring-aop-5.1.6.RELEASE.jar, file:/home/iss-user/.m2/repository/org/aspectj/aspectjweaver/1.9.2/aspectjweaver-1.9.2.jar, file:/home/iss-user/.m2/repository/org/springframework/boot/spring-boot-star  
ter-jdbc/2.1.4.RELEASE/spring-boot-starter-jdbc-2.1.4.RELEASE.jar, file:/home/iss-user/.m2/repository/com/zaxxer/HikariCP/3.2.0/HikariCP-3.2.0.jar, file:/home/iss-user/.m2/repository/org/springframework/s  
pring-jdbc/5.1.6.RELEASE/spring-jdbc-5.1.6.RELEASE.jar, file:/home/iss-user/.m2/repository/javax/transaction/javax.transaction-api/1.3/javax.transaction-api-1.3.jar, file:/home/iss-user/.m2/repository/jav  
a/bytebuddy/byte-buddy/1.9.12/byte-buddy-1.9.12.jar, file:/home/iss-user/.m2/repository/org/aspectj/aspectjweaver/1.9.2/aspectjweaver-1.9.2.jar, file:/home/iss-user/.m2/repository/org/hiberna  
te/hibernate-core/5.3.9.Final/hibernate-core-5.3.9.Final.jar, file:/home/iss-user/.m2/repository/org/jboss/logging/jboss-logging/3.3.2.Final/jboss-logging-3.3.2.Final.jar, file:/home/iss-user/.m2/reposito  
ry/javax/persistence/javax.persistence-api/2.2/javax.persistence-api-2.2.jar, file:/home/iss-user/.m2/repository/org/javassist/javassist/3.23.1-GA/javassist-3.23.1-GA.jar, file:/home/iss-user/.m2/reposito  
ry/net/bytebuddy/byte-buddy/1.9.12/byte-buddy-1.9.12.jar, file:/home/iss-user/.m2/repository/org/dom4j/dom4j/2.1.1/dom4j-2.1.1.jar, file:/home/iss-user/.m2/repository/org/hibernate/hibernate-commo  
ns-annotations/5.0.4.Final/hibernate-commons-annotations-5.0.4.Final.jar, file:/home/iss-user/.m2/repository/org/springframework/data/spring-data-commons/2.1.6.RELEASE/spring-data-commons-2.1.6.RELEASE.jar, file:/home/iss-user/.m2/repository/or  
g/springframework/spring-orm/5.1.6.RELEASE/spring-orm-5.1.6.RELEASE.jar, file:/home/iss-user/.m2/repository/org/springframework/spring-context/5.1.6.RELEASE/spring-context-5.1.6.RELEASE.jar, file:/home/iss
```

```
2019-05-15 10:53:38.105 [main] DEBUG Dirty checking collections  
2019-05-15 10:53:38.105 [main] DEBUG Flushed: 1 insertions, 0 updates, 0 deletions to 1 objects  
2019-05-15 10:53:38.105 [main] DEBUG Flushed: 0 (re)creations, 0 updates, 0 removals to 0 collections  
2019-05-15 10:53:38.105 [main] DEBUG Listing entities:  
2019-05-15 10:53:38.105 [main] DEBUG com.antline.services.model.Station(shift=0, name=bedok, id=56912)  
2019-05-15 10:53:38.105 [main] DEBUG Insert into station (name, shift, id) values (?, ?, ?)  
2019-05-15 10:53:38.105 [main] DEBUG Closing JPA EntityManager [SessionImpl(1427223816<open>)] after transaction  
2019-05-15 10:53:38.105 [main] DEBUG Creating new transaction with name [org.springframework.data.jpa.repository.support.SimpleJpaRepository.save]: PROPAGATION_REQUIRED, ISOLATION_DEFAULT  
2019-05-15 10:53:38.105 [main] DEBUG Opened new EntityManager [SessionImpl(1300486166<open>)] for JPA transaction  
2019-05-15 10:53:38.105 [main] DEBUG On TransactionImpl creation, JpaCompliance[isJpaTransactionComplianceEnabled == false  
2019-05-15 10:53:38.105 [main] DEBUG begin  
2019-05-15 10:53:38.105 [main] DEBUG Exposing JPA transaction as JDBC [org.springframework.orm.jpa.vendor.HibernateJpaDialect$HibernateConnectionHandle@5f7f316]  
2019-05-15 10:53:38.105 [main] DEBUG Loading entity: [com.antline.services.model.Station@16989]  
2019-05-15 10:53:38.105 [main] DEBUG select station0_ from station0_ where station0_ id=?  
2019-05-15 10:53:38.105 [main] DEBUG Done entity load  
2019-05-15 10:53:38.105 [main] DEBUG Generated identifier: 16989, using strategy: org.hibernate.id.Assigned  
2019-05-15 10:53:38.105 [main] DEBUG Initiating transaction commit  
2019-05-15 10:53:38.105 [main] DEBUG Committing JPA transaction on EntityManager [SessionImpl(1300486166<open>)]  
2019-05-15 10:53:38.105 [main] DEBUG committing  
2019-05-15 10:53:38.105 [main] DEBUG Processing flush-time cascades  
2019-05-15 10:53:38.105 [main] DEBUG Dirty checking collections  
2019-05-15 10:53:38.105 [main] DEBUG Flushed: 1 insertions, 0 updates, 0 deletions to 1 objects  
2019-05-15 10:53:38.105 [main] DEBUG Flushed: 0 (re)creations, 0 updates, 0 removals to 0 collections  
2019-05-15 10:53:38.105 [main] DEBUG Listing entities:  
2019-05-15 10:53:38.105 [main] DEBUG com.antline.services.model.Station(shift=0, name=choa chu kang, id=16989)  
2019-05-15 10:53:38.105 [main] DEBUG Insert into station (name, shift, id) values (?, ?, ?)  
2019-05-15 10:53:38.105 [main] DEBUG Closing JPA EntityManager [SessionImpl(1300486166<open>)] after transaction  
2019-05-15 10:53:38.105 [main] DEBUG Creating new transaction with name [org.springframework.data.jpa.repository.support.SimpleJpaRepository.save]: PROPAGATION_REQUIRED, ISOLATION_DEFAULT  
2019-05-15 10:53:38.105 [main] DEBUG Opened new EntityManager [SessionImpl(110998430<open>)] for JPA transaction  
2019-05-15 10:53:38.105 [main] DEBUG On TransactionImpl creation, JpaCompliance[isJpaTransactionComplianceEnabled == false  
2019-05-15 10:53:38.105 [main] DEBUG begin  
2019-05-15 10:53:38.105 [main] DEBUG Exposing JPA transaction as JDBC [org.springframework.orm.jpa.vendor.HibernateJpaDialect$HibernateConnectionHandle@49d12454]  
2019-05-15 10:53:38.105 [main] DEBUG Loading entity: [com.antline.services.model.Station@72518]  
2019-05-15 10:53:38.105 [main] DEBUG select station0_ from station0_ where station0_ id=?  
2019-05-15 10:53:38.105 [main] DEBUG Done entity load  
2019-05-15 10:53:38.105 [main] DEBUG Generated identifier: 72518, using strategy: org.hibernate.id.Assigned  
2019-05-15 10:53:38.105 [main] DEBUG Initiating transaction commit  
2019-05-15 10:53:38.105 [main] DEBUG Committing JPA transaction on EntityManager [SessionImpl(110998430<open>)]  
2019-05-15 10:53:38.105 [main] DEBUG committing  
2019-05-15 10:53:38.105 [main] DEBUG Processing flush-time cascades  
2019-05-15 10:53:38.105 [main] DEBUG Dirty checking collections  
2019-05-15 10:53:38.105 [main] DEBUG Flushed: 1 insertions, 0 updates, 0 deletions to 1 objects  
2019-05-15 10:53:38.105 [main] DEBUG Flushed: 0 (re)creations, 0 updates, 0 removals to 0 collections  
2019-05-15 10:53:38.105 [main] DEBUG Listing entities:  
2019-05-15 10:53:38.105 [main] DEBUG com.antline.services.model.Station(shift=0, name=harbourfront, id=72518)  
2019-05-15 10:53:38.105 [main] DEBUG Insert into station (name, shift, id) values (?, ?, ?)  
2019-05-15 10:53:38.105 [main] DEBUG Closing JPA EntityManager [SessionImpl(110998430<open>)] after transaction  
Initialized database  
RosterPlanner is started successfully.  
2019-05-15 10:54:16.815 [HikariPool-1 housekeeper] DEBUG HikariPool-1 - Pool stats (total=10, active=0, idle=10, waiting=0)
```

< Front End Sub-system >

<https://www.techomoro.com/how-to-install-and-setup-angular-7-on-ubuntu-18-04-1/>

2. Install Nodejs

It can be installed by running the command below on our Terminal.

```
curl -sL https://deb.nodesource.com/setup_11.x | sudo -E bash -
```

[sudo] password for iss-user: iss-user

```
iss-user@iss-vn:~$ curl -sL https://deb.nodesource.com/setup_11.x | sudo -E bash -
[sudo] password for iss-user:
## Installing the NodeSource Node.js 11.x repo...

## Populating apt-get cache...

+ apt-get update
Hit:1 http://repo.mongodb.org/apt/ubuntu xenial/mongodb-org/3.2 InRelease
Hit:2 http://repo.mongodb.org/apt/ubuntu xenial/mongodb-org/3.2 Release
Hit:3 https://download.docker.com/linux/ubuntu xenial InRelease
Hit:4 http://ppa.launchpad.net/linuxgndu/sqlitebrowser/ubuntu xenial InRelease
Hit:5 http://packages.ros.org/ros/ubuntu xenial InRelease
Hit:6 http://security.ubuntu.com/ubuntu xenial-security InRelease
Hit:7 http://sg.archive.ubuntu.com/ubuntu xenial InRelease
Hit:8 http://sg.archive.ubuntu.com/ubuntu xenial-backports InRelease
Hit:9 https://sg.archive.ubuntu.com/ubuntu xenial-updates InRelease
Hit:10 http://sg.archive.ubuntu.com/ubuntu xenial-backports InRelease
Reading package lists... Done

## Confirming "xenial" is supported...

+ curl -sif -o /dev/null 'https://deb.nodesource.com/node_11.x/dists/xenial/Release'

## Adding the NodeSource signing key to your keyring...

+ curl -s https://deb.nodesource.com/gpgkey/nodesource.gpg.key | apt-key add -
OK

## Creating apt sources list file for the NodeSource Node.js 11.x repo...

+ echo 'deb https://deb.nodesource.com/node_11.x xenial main' > /etc/apt/sources.list.d/nodesource.list
+ echo 'deb-src https://deb.nodesource.com/node_11.x xenial main' >> /etc/apt/sources.list.d/nodesource.list

## Running 'apt-get update' for you...

+ apt-get update
Ign:1 http://repo.mongodb.org/apt/ubuntu xenial/mongodb-org/3.2 InRelease
Hit:2 http://repo.mongodb.org/apt/ubuntu xenial/mongodb-org/3.2 Release
Hit:3 http://security.ubuntu.com/ubuntu xenial-security InRelease
Hit:4 http://ppa.launchpad.net/linuxgndu/sqlitebrowser/ubuntu xenial InRelease
Hit:5 http://sg.archive.ubuntu.com/ubuntu xenial InRelease
Get:7 https://deb.nodesource.com/node_11.x xenial InRelease [4,584 B]
Hit:8 https://download.docker.com/linux/ubuntu xenial InRelease
Hit:9 http://packages.ros.org/ros/ubuntu xenial InRelease
Hit:10 http://sg.archive.ubuntu.com/ubuntu xenial-updates InRelease
Hit:11 http://sg.archive.ubuntu.com/ubuntu xenial-backports InRelease
Get:12 https://deb.nodesource.com/node_11.x xenial/main amd64 Packages [768 B]
Fetched 5,352 B in 1s (3,169 B/s)
Reading package lists... Done

## Run 'sudo apt-get install -y nodejs' to install Node.js 11.x and npm
## You may also need development tools to build native addons:
```

```
sudo apt-get install -y nodejs
```

```
echo 'deb https://dl.yarnpkg.com/debian/ stable main' | sudo tee /etc/apt/sources.list.d/yarn.list
sudo apt-get update && sudo apt-get install yarn

iss-user@iss-vn:~$ sudo apt-get install -y nodejs
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following packages were automatically installed and are no longer required:
  gyp libjs-inherits libjs-node-uuid libuv1 libuv1-dev linux-headers-4.15.0-36
  linux-headers-4.15.0-36-generic linux-headers-4.15.0-39
  linux-headers-4.15.0-39-generic linux-image-4.15.0-36-generic
  linux-image-4.15.0-38-generic linux-image-4.15.0-39-generic
  linux-modules-4.15.0-36-generic linux-modules-4.15.0-38-generic
  linux-modules-4.15.0-39-generic linux-modules-extra-4.15.0-36-generic
  linux-modules-extra-4.15.0-38-generic linux-modules-extra-4.15.0-39-generic
  node-abbrev node-ansi node-ansi-color-table node-archy node-async
  node-block-stream node-combined-stream node-cookie-jar node-delayed-stream
  node-forever-agent node-form-data node-fstream node-fstream-ignore
  node-github-url-from-git node-glob node-graceful-fs node-gyp node-inherits
  node-ltn node-json-stringify-safe node-lockfile node-lru-cache node-mime
  node-minimatch node-mkdirp node-mute-stream node-node-uuid node-npm
  node-normalize-package-data node-npmlog node-once node-osenv node-q
  node-read node-read-package-json node-request node-retry node-rimraf
  node-sever node-sha node-signund node-slide node-tar node-tunnel-agent
  node-underscore node-which
Use 'sudo apt autoremove' to remove them.
The following packages will be REMOVED:
  nodejs-dev npm
The following packages will be upgraded:
  nodejs
1 upgraded, 0 newly installed, 2 to remove and 253 not upgraded.
Need to get 16.2 MB of archives.
After this operation, 52.9 MB of additional disk space will be used.
Get:1 https://deb.nodesource.com/node_11.x xenial/main amd64 nodejs [16.2 MB]
Fetched 16.2 MB in 1s (9,029 kB/s)
(Reading database ... 423003 files and directories currently installed.)
Removing npm (3.5.2-ubuntu4) ...
dpkg: nodejs-dev: dependency problems, but removing anyway as you requested:
  node-gyp depends on nodejs-dev.
Removing nodejs-dev (4.2.6-dfsg-1ubuntu4.2) ...
Processing triggers for man-db (2.7.5-1) ...
Processing triggers for doc-base (0.10.7) ...
Processing 3 removed doc-base files...
(Reading database ... 419946 files and directories currently installed.)
Preparing to unpack .../nodejs_11.15.0-inodesource1_amd64.deb ...
Unpacking nodejs (11.15.0-inodesource1) over (4.2.6-dfsg-1ubuntu4.2) ...
Processing triggers for man-db (2.7.5-1) ...
Processing triggers for doc-base (0.10.7) ...
Processing 1 removed doc-base file...
Setting up nodejs (11.15.0-inodesource1) ...
```


3. Install Angular Cli

It can be installed by:

```
sudo npm install -g @angular/cli
```

```
linux-headers-4.15.0-36-generic linux-headers-4.15.0-38
linux-headers-4.15.0-36-generic linux-headers-4.15.0-39
linux-headers-4.15.0-39-generic linux-image-4.15.0-36-generic
linux-image-4.15.0-38-generic linux-image-4.15.0-39-generic
linux-modules-4.15.0-36-generic linux-modules-4.15.0-38-generic
linux-modules-4.15.0-39-generic linux-modules-extra-4.15.0-36-generic
linux-modules-extra-4.15.0-38-generic linux-modules-extra-4.15.0-39-generic
node-abbrev node-ansi node-ansi-color-table node-archy node-async
node-block-stream node-combined-stream node-cookie-jar node-delayed-stream
node-forever-agent node-form-data node-fstream node-fstream-ignore
node-github-url-from-git node-glob node-graceful-fs node-gyp node-inherits
node-ini node-json-stringify-safe node-lazy-cache node-lru-cache node-mime
node-minimatch node-mkdirp node-mute-stream node-nopt node-osenv node-qs
node-read node-read-package-json node-request node-retry node-rimraf
node-sax node-sha node-signum node-slide node-tar node-tunnel-agent
node-underscore node-which
Use 'sudo apt autoremove' to remove them.
The following packages will be REMOVED:
  nodejs-dev npm
The following packages will be upgraded:
  nodejs
1 upgraded, 0 newly installed, 2 to remove and 253 not upgraded.
Need to get 16.2 MB of archives.
After this operation, 52.9 MB of additional disk space will be used.
Get:1 https://deb.nodesource.com/node_11.x xenial/main amd64 nodejs amd64 11.15.0-1nodesource1 [16.2 MB]
Fetched 16.2 MB in 1s (9,029 kB/s)
(Reading database ... 428083 files and directories currently installed.)
Removing npm (3.5.2-0ubuntu4) ...
dpkg: nodejs-dev: dependency problems, but removing anyway as you requested:
 node-gyp depends on nodejs-dev.
Removing nodejs-dev (4.2.6-dfsg-1ubuntu4.2) ...
Processing triggers for man-db (2.7.5-1) ...
Processing triggers for doc-base (0.10.7) ...
Processing 3 removed doc-base files...
(Reading database ... 419966 files and directories currently installed.)
Preparing to unpack .../nodejs_11.15.0-1nodesource1_amd64.deb ...
Unpacking nodejs (11.15.0-1nodesource1) over (4.2.6-dfsg-1ubuntu4.2) ...
Processing triggers for man-db (2.7.5-1) ...
Processing triggers for doc-base (0.10.7) ...
Processing 1 removed doc-base file...
Setting up nodejs (11.15.0-1nodesource1) ...
lss-user@lss-vpn:~$ sudo npm install -g @angular/cli
/usr/bin/ng -> /usr/lib/node_modules/@angular/cli/bin/ng
npm WARN optional SKIPPING OPTIONAL DEPENDENCY: fsevents@1.2.9 (node_modules/@angular/cli/node_modules/fsevents):
npm WARN notsup SKIPPING OPTIONAL DEPENDENCY: Unsupported platform for fsevents@1.2.9: wanted {"os":"darwin","arch":"any"} (current: {"os":"linux","arch":"x64"})
+ @angular/cli@7.3.9
added 295 packages from 180 contributors in 18.125s
lss-user@lss-vpn:~$ node --version
v11.15.0
lss-user@lss-vpn:~$
```

4. Grant user access for npm update check:

```
sudo chown -R $USER:$ (id -gn $USER) /home/iss-user/.config
```

5. Navigate to the /IRS-RS-2019-03-09-IS1PT-GRP-2-GOH-

Intelligent_Employee_Scheduler/SystemCode/frontend folder and enter

```
sudo npm install
```

```
lss-user@lss-vpn:~/lss-vn-program/lss-intelligent-reasoning-systems/glt-IRS-RS/2/IRS-RS-2019-03-09-IS1PT-GRP-2-GOH-Intelligent_Employee_Scheduler/frontend$ ll
total 428
drwxrwx--- 4 lss-user lss-user 4096 May 15 10:07 ./
drwxrwx--- 6 lss-user lss-user 4096 May 11 10:23 ../
-rwxrwx--- 1 lss-user lss-user 3960 May 11 10:23 angular.json*
-rwxrwx--- 1 lss-user lss-user 6148 May 11 10:23 .DS_Store*
drwxrwx--- 3 lss-user lss-user 4096 May 11 10:23 e2e/
-rwxrwx--- 1 lss-user lss-user 1580 May 11 10:23 package.json*
-rwxrwx--- 1 lss-user lss-user 390001 May 11 10:23 package-lock.json*
-rwxrwx--- 1 lss-user lss-user 1052 May 11 10:23 README.md*
drwxrwx--- 4 lss-user lss-user 4096 May 11 10:23 src/
-rwxrwx--- 1 lss-user lss-user 457 May 11 10:23 tsconfig.json*
-rwxrwx--- 1 lss-user lss-user 1096 May 11 10:23 tsint.json*
lss-user@lss-vpn:~/lss-vn-program/lss-intelligent-reasoning-systems/glt-IRS-RS/2/IRS-RS-2019-03-09-IS1PT-GRP-2-GOH-Intelligent_Employee_Scheduler/frontend$ sudo npm install
> node-sass@4.11.0 install /home/lss-user/lss-vn-program/lss-intelligent-reasoning-systems/glt-IRS-RS/2/IRS-RS-2019-03-09-IS1PT-GRP-2-GOH-Intelligent_Employee_Scheduler/frontend/node_modules/node-sass
> node scripts/install.js
Unable to save binary /home/lss-user/lss-vn-program/lss-intelligent-reasoning-systems/glt-IRS-RS/2/IRS-RS-2019-03-09-IS1PT-GRP-2-GOH-Intelligent_Employee_Scheduler/frontend/node_modules/node-sass/vendor/linux-x64-67: (Error: EACCES: permission denied, mkdir '/home/lss-user/lss-vn-program/lss-intelligent-reasoning-systems/glt-IRS-RS/2/IRS-RS-2019-03-09-IS1PT-GRP-2-GOH-Intelligent_Employee_Scheduler/frontend/node_modules/node-sass/vendor')
    at Object.mkdirSync (fs.js:773:3)
    at sync (/home/lss-user/lss-vn-program/lss-intelligent-reasoning-systems/glt-IRS-RS/2/IRS-RS-2019-03-09-IS1PT-GRP-2-GOH-Intelligent_Employee_Scheduler/frontend/node_modules/mkdirp/index.js:71:13)
    at Function.sync (/home/lss-user/lss-vn-program/lss-intelligent-reasoning-systems/glt-IRS-RS/2/IRS-RS-2019-03-09-IS1PT-GRP-2-GOH-Intelligent_Employee_Scheduler/frontend/node_modules/mkdirp/index.js:77:24)
    at checkAndDownloadBinary (/home/lss-user/lss-vn-program/lss-intelligent-reasoning-systems/glt-IRS-RS/2/IRS-RS-2019-03-09-IS1PT-GRP-2-GOH-Intelligent_Employee_Scheduler/frontend/node_modules/node-sass/scripts/install.js:114:11)
    at Object.<anonymous> (/home/lss-user/lss-vn-program/lss-intelligent-reasoning-systems/glt-IRS-RS/2/IRS-RS-2019-03-09-IS1PT-GRP-2-GOH-Intelligent_Employee_Scheduler/frontend/node_modules/node-sass/scripts/install.js:157:5)
    at Module._compile (internal/modules/cjs/loader.js:816:30)
    at Object.Module._extensions..js (internal/modules/cjs/loader.js:827:10)
    at Module.load (internal/modules/cjs/loader.js:645:32)
    at Function.Module._load (internal/modules/cjs/loader.js:620:12)
    at Function.Module.runMain (internal/modules/cjs/loader.js:877:12)
  errno: -13,
  syscall: 'mkdir',
  code: 'EACCES',
  path:
    /home/lss-user/lss-vn-program/lss-intelligent-reasoning-systems/glt-IRS-RS/2/IRS-RS-2019-03-09-IS1PT-GRP-2-GOH-Intelligent_Employee_Scheduler/frontend/node_modules/node-sass/vendor
}
> node-sass@4.11.0 postinstall /home/lss-user/lss-vn-program/lss-intelligent-reasoning-systems/glt-IRS-RS/2/IRS-RS-2019-03-09-IS1PT-GRP-2-GOH-Intelligent_Employee_Scheduler/frontend/node_modules/node-sass
> node scripts/build.js
Building: /usr/bin/node /home/lss-user/lss-vn-program/lss-intelligent-reasoning-systems/glt-IRS-RS/2/IRS-RS-2019-03-09-IS1PT-GRP-2-GOH-Intelligent_Employee_Scheduler/frontend/node_modules/node-gyp/bin/node-gyp.js rebuild --verbose --libsass_ext= --libsass_cflags= --libsass_ldflags= --libsass_library=
gyp info it worked! it ended with 0
gyp verb cli [ '/usr/bin/node',
gyp verb cli   '/home/lss-user/lss-vn-program/lss-intelligent-reasoning-systems/glt-IRS-RS/2/IRS-RS-2019-03-09-IS1PT-GRP-2-GOH-Intelligent_Employee_Scheduler/frontend/node_modules/node-gyp/bin/node-gyp.js',
gyp verb cli   'rebuild' ]
```

6. Update user access:

```
sudo chown -R $USER:$USER *
```

7. Run command

ng serve

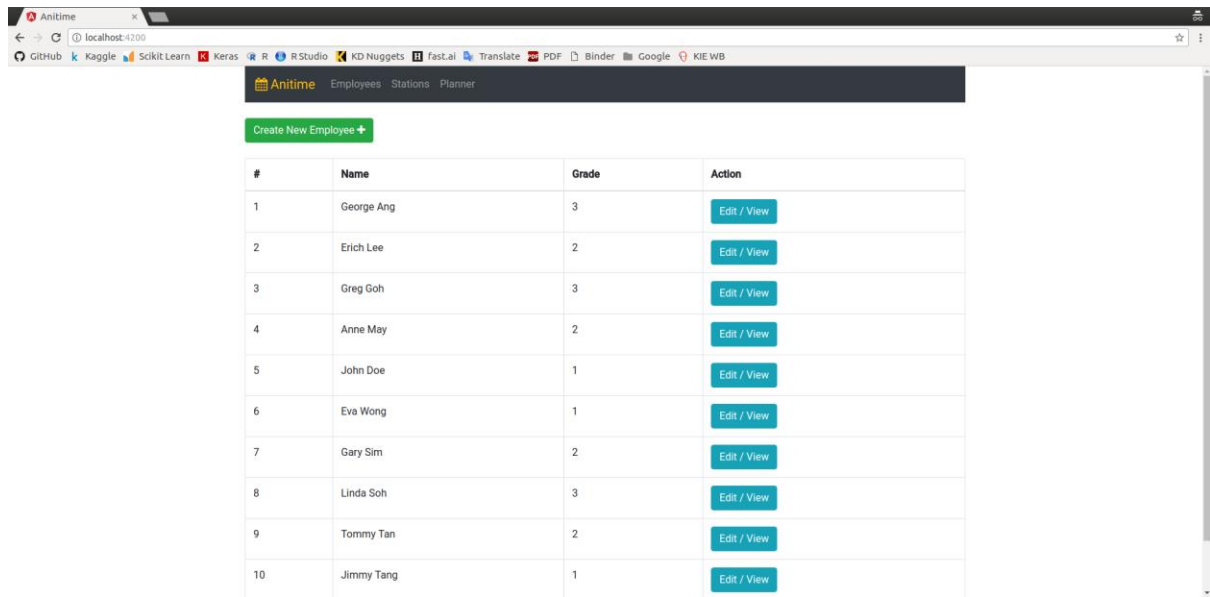
```
iss-user@biss-vm: ~/iss-vn-program/iss-intelligent-reasoning-systems/git-IRS-RS/2/IRS-RS-2019-03-09-IS1PT-GRP-2-GOH-Intellige... x
"930899adac6a70a73647e426561ff5f05bda926075888cd998bc71ab104c5989", "node-v11.15.0-win-x64.zip": "f3cef50ac560724a5ec5df7697f527d7339cafdae6c7c406a39358aee6cdf8", "node-v11.15.0-win-x86.7z": "fef827207376d9
0712f3c805e16519d9ef95bac42bc3625f0546d17df7e12f8", "node-v11.15.0-win-x86.zip": "44265a6474561c9e34c2ec8c0f3b9c8bbd1ec81b56d702f028f9249451a7a", "node-v11.15.0-x64.msl": "d383c648f637aa672f42543104b97d3f
6921b8b6e502b245794ad4a32b1eb", "node-v11.15.0-x86.msl": "02d824807bfa2b2194838f53f9a58f48a829cde78e020fe9727a8e9f48", "win-x64/node.exe": "3d67c207e37d7dfacbc17ed9705dbd8f61eb33f23636c63474745d835bf3
f8bdf", "win-x64/node.lib": "5d3b770cfcc81d8005443ff7c2dd9ea8c02b8850ea8c7c395342219c48a4a9b", "win-x64/node_pdb.7z": "8b86643081d0f499fc587509da10d4fe23d74d0e464aa2dee3a07cdd80b77b", "win-x64/node_pdb.zip": "27e7bf1d545066861aa12b32924080470ed939ee0e5438231e3a0221324a360", "win-x86/node.exe": "70d09f36f31376d97bd7142717597def00cd481bf1eb18cf25a0861419a9c72", "win-x86/node.lib": "f8e3ac52d04d170b3d697697fa4425
20a25f9e27d9075bca3ad0bbee2125d", "win-x86/node_pdb.7z": "e55446bd49f5a5de1908e7983bedc7b0b3b7772e58d3ac73ece34542c58ad3a", "win-x86/node_pdb.zip": "4d9f45f557ea3b59b8459b70b74c1a688b3d0b922ca81171374181
c68847775")
gyp verb download contents checksum ["node-v11.15.0-headers.tar.gz": "e738ca0fa48e1b43a4eddb83accb7ed6ce5aa27e74ccfd26989eb87aadd509"]
gyp verb validating download checksum for node-v11.15.0-headers.tar.gz (e738ca0fa48e1b43a4eddb83accb7ed6ce5aa27e74ccfd26989eb87aadd509 == e738ca0fa48e1b43a4eddb83accb7ed6ce5aa27e74ccfd26989eb87aadd509)
gyp verb get node dir target node version installed: 11.15.0
gyp verb find dir attempting to create "build" dir: /home/iss-user/iss-vn-program/iss-intelligent-reasoning-systems/git-IRS-RS/2/IRS-RS-2019-03-09-IS1PT-GRP-2-GOH-Intelligent_Employee_Scheduler/frontend/n
ode_modules/node-sass/build
node_modules/node-sass/build
gyp ERR! configure error
gyp ERR! stack Error: EACCES: permission denied, mkdir '/home/iss-user/iss-vn-program/iss-intelligent-reasoning-systems/git-IRS-RS/2/IRS-RS-2019-03-09-IS1PT-GRP-2-GOH-Intelligent_Employee_Scheduler/fronten
d/node_modules/node-sass/build'
gyp ERR! System Linux 4.15.0-47-generic
gyp ERR! command "/usr/bin/node" "/home/iss-user/iss-vn-program/iss-intelligent-reasoning-systems/git-IRS-RS/2/IRS-RS-2019-03-09-IS1PT-GRP-2-GOH-Intelligent_Employee_Scheduler/frontend/node-gy
p/bin/node-gyp.js" "rebuild" "-verbose" "--libsass_ext=""--libsass_cflags=""--libsass_ldflags=""--libsass_library=""
gyp ERR! cwd /home/iss-user/iss-vn-program/iss-intelligent-reasoning-systems/git-IRS-RS/2/IRS-RS-2019-03-09-IS1PT-GRP-2-GOH-Intelligent_Employee_Scheduler/frontend/node_modules/node-sass
gyp ERR! node -v v11.15.0
gyp ERR! node-gyp -v v3.8.0
gyp ERR! not ok
Build failed with error code: 1
npm WARN optional SKIPPING OPTIONAL DEPENDENCY: fsevents@1.2.7 (node_modules/fsevents):
npm WARN notsup SKIPPING OPTIONAL DEPENDENCY: Unsupported platform for fsevents@1.2.7: wanted {"os":"darwin","arch":"any"} (current: {"os":"linux","arch":"x64"})
npm WARN optional SKIPPING OPTIONAL DEPENDENCY: node-sass@4.11.0 (node_modules/node-sass):
npm WARN notsup SKIPPING OPTIONAL DEPENDENCY: Unsupported platform for node-sass@4.11.0: wanted {"os":"linux","arch":"x64"}
npm WARN optional SKIPPING OPTIONAL DEPENDENCY: node-sass@4.11.0 postinstall: node scripts/build.js
npm WARN optional SKIPPING OPTIONAL DEPENDENCY: Exit status 1
added 1038 packages from 1014 contributors and audited 42488 packages in 36.797s
found 1 vulnerability (1 low, 2 high)
run 'npm audit fix' to fix them, or 'npm audit' for details
iss-user@biss-vm:~/iss-vn-program/iss-intelligent-reasoning-systems/git-IRS-RS/2/IRS-RS-2019-03-09-IS1PT-GRP-2-GOH-Intelligent_Employee_Scheduler/frontend$ ng serve
Your global Angular CLI version (7.3.9) is greater than your local
version (7.3.8). The local Angular CLI version is used.

To disable this warning use 'ng config -o cli.warnMsg.versionMismatch false'.
** Angular Live Development Server is listening on localhost:4200, open your browser on http://localhost:4200/ **

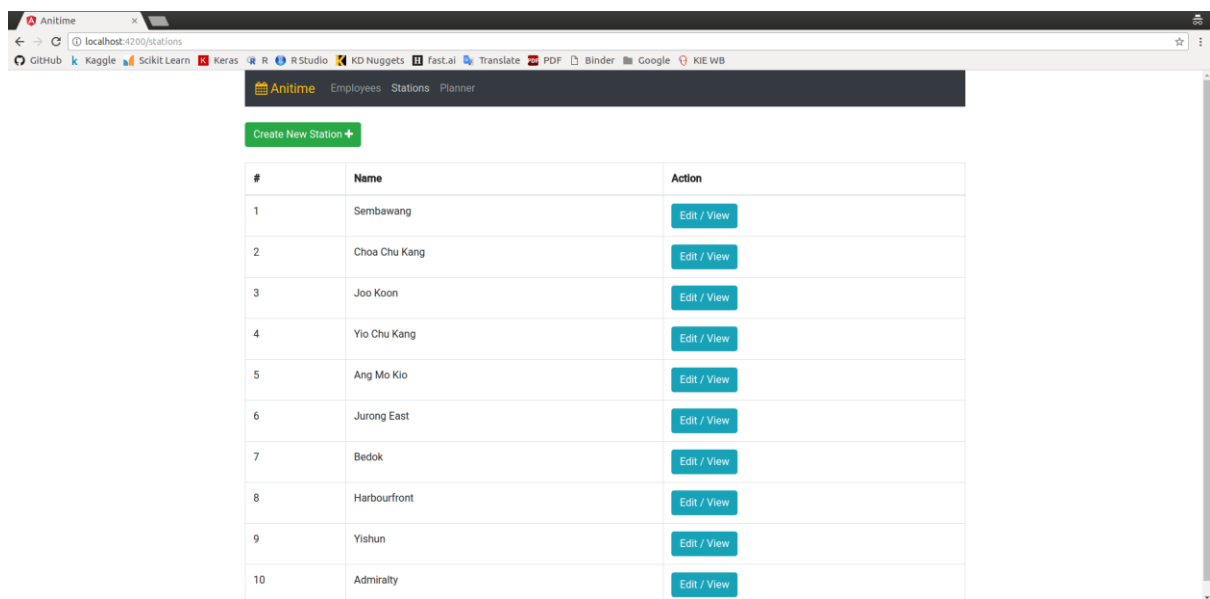
Date: 2019-05-15T05:10:25.304Z
Hash: 4e638cc0486eaa807e2
Time: 30230ms
chunk (es2015-polyfills) es2015-polyfills.js, es2015-polyfills.js.map (es2015-polyfills) 284 kB [initial] [rendered]
chunk (main) main.js, main.js.map (main) 79.4 kB [initial] [rendered]
chunk (polyfills) polyfills.js, polyfills.js.map (polyfills) 236 kB [initial] [rendered]
chunk (runtime) runtime.js, runtime.js.map (runtime) 0.08 kB [entry] [rendered]
chunk (styles) styles.js, styles.js.map (styles) 1.05 MB [initial] [rendered]
chunk (vendor) vendor.js, vendor.js.map (vendor) 7.03 MB [initial] [rendered]
[webpack]: Compiled successfully.
```

If you get any npm WARN messages you can ignore them as you should still be able to do an **ng serve**. As from the second screenshot, we can still serve the frontend.

8. Open browser, go to: **http://localhost:4200/**



#	Name	Grade	Action
1	George Ang	3	Edit / View
2	Erich Lee	2	Edit / View
3	Greg Goh	3	Edit / View
4	Anne May	2	Edit / View
5	John Doe	1	Edit / View
6	Eva Wong	1	Edit / View
7	Gary Sim	2	Edit / View
8	Linda Soh	3	Edit / View
9	Tommy Tan	2	Edit / View
10	Jimmy Tang	1	Edit / View



#	Name	Action
1	Sembawang	Edit / View
2	Choa Chu Kang	Edit / View
3	Joo Koon	Edit / View
4	Yio Chu Kang	Edit / View
5	Ang Mo Kio	Edit / View
6	Jurong East	Edit / View
7	Bedok	Edit / View
8	Harbourfront	Edit / View
9	Yishun	Edit / View
10	Admiralty	Edit / View

Anitime
Employees Stations Planner

Search Employees

Employee	Grade	Preferred Station	Mon AM	Mon PM	Tue AM	Tue PM	Wed AM	Wed PM	Thu AM	Thu PM	Fri AM	Fri PM	Action
George Ang	3		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Add

Employees Added

#	First Name	Last Name
1	Linda	Soh
2	John	Doe
3	George	Ang

Search Station

Station	Mon AM	Mon PM	Tue AM	Tue PM	Wed AM	Wed PM	Thu AM	Thu PM	Fri AM	Fri PM	Action
Yishun	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Add

Stations Added

#	Name	Shift
1	Admiralty	0
2	Sembawang	7
3	Yishun	4

Solve

Terminal
File
Edit
View
Search
Terminal
Tools
Help

Anitime
Employees Stations Planner

Schedule for the week

Employee	Grade	Mon AM	Mon PM	Tue AM	Tue PM	Wed AM	Wed PM	Thu AM	Thu PM	Fri AM	Fri PM
Linda Soh	Grade 3										
John Doe	Grade 1										
George Ang	Grade 3										

```

lss-user@lss-vm: ~/lss-vm-program/lss-intelligent-reasoning-systems/glt-IRS-R5/2/IRS-R5-2019-03-09-ISTPT-GRP-2-GOH-Intelligent_Employee_Scheduler/services
lss-user@lss-vm: ~/lss-vm-program/lss-intelligent-reasoning-systems/glt-IRS-R5/2/IRS-R5-2019-03-09-ISTPT-GRP-2-GO...
-ihard/0soft
JobAssignment:JobAssignment [logger=Logger[JobAssignment], employee=Employee [name=GeorgeAng, employeeID=1218, employeeGrade=3, preferredLocation=0], shiftAvailability=[0, 1, 2, 3, 4, 5, 6, 7, 8, 9]], job=Job [jobID=87184, jobLocation=87184, shift=0]
JobAssignment:JobAssignment [logger=Logger[JobAssignment], employee=Employee [name=LindaSoh, employeeID=66143, employeeGrade=3, preferredLocation=0], shiftAvailability=[0, 1, 2, 3, 4, 5, 6, 7, 8, 9]], job=Job [jobID=6861, jobLocation=6861, shift=7]
JobAssignment:JobAssignment [logger=Logger[JobAssignment], employee=Employee [name=JohnDoe, employeeID=22327, employeeGrade=1, preferredLocation=0], shiftAvailability=[0, 1, 2, 3, 4, 5, 6, 7, 8, 9]], job=Job [jobID=79444, jobLocation=79444, shift=4]
Hardscore:0
Softscore:0
0hard/0soft
JobAssignment:JobAssignment [logger=Logger[JobAssignment], employee=Employee [name=GeorgeAng, employeeID=1218, employeeGrade=3, preferredLocation=0], shiftAvailability=[0, 1, 2, 3, 4, 5, 6, 7, 8, 9]], job=Job [jobID=87184, jobLocation=87184, shift=0]
JobAssignment:JobAssignment [logger=Logger[JobAssignment], employee=Employee [name=JohnDoe, employeeID=22327, employeeGrade=1, preferredLocation=0], shiftAvailability=[0, 1, 2, 3, 4, 5, 6, 7, 8, 9]], job=Job [jobID=6861, jobLocation=6861, shift=7]
JobAssignment:JobAssignment [logger=Logger[JobAssignment], employee=Employee [name=JohnDoe, employeeID=22327, employeeGrade=1, preferredLocation=0], shiftAvailability=[0, 1, 2, 3, 4, 5, 6, 7, 8, 9]], job=Job [jobID=79444, jobLocation=79444, shift=4]
Hardscore:-1
Softscore:0
-ihard/0soft
2019-05-15 10:58:47,179 [http-nio-8082-exec-7] DEBUG LS step (1), time spent (2024), score (-ihard/0soft), best score (0hard/0soft), accepted/selected move count (486/2473), picked n
ove [JobAssignment [logger=Logger[JobAssignment], employee=Employee [name=JohnDoe, employeeID=22327, employeeGrade=1, preferredLocation=0], shiftAvailability=[0, 1, 2, 3, 4, 5, 6, 7, 8, 9]]
, job=Job [jobID=6861, jobLocation=6861, shift=7]] [Employee [name=JohnDoe, employeeID=22327, employeeGrade=1, preferredLocation=0], shiftAvailability=[0, 1, 2, 3, 4, 5, 6, 7, 8, 9]]
Employee [name=LindaSoh, employeeID=66143, employeeGrade=3, preferredLocation=0], shiftAvailability=[0, 1, 2, 3, 4, 5, 6, 7, 8, 9]]] -> Emp
2019-05-15 10:58:47,179 [http-nio-8082-exec-7] INFO Local Search phase (1) ended: time spent (2024), best score (0hard/0soft), score calculation speed (1638/sec), step total (2)
2019-05-15 10:58:47,180 [http-nio-8082-exec-7] INFO Solving ended: time spent (2025), best score (0hard/0soft), score calculation speed (1617/sec), phase total (2), environment mode (REPROD
UCIBLE).
Solution:JobSchedule.null
After solving schedule.....
JobID: 87184, Shift: 0, Location: 87184, Employee: LindaSoh
JobID: 6861, Shift: 7, Location: 6861, Employee: JohnDoe
JobID: 79444, Shift: 4, Location: 79444, Employee: GeorgeAng
.....
2019-05-15 10:58:47,181 [http-nio-8082-exec-7] DEBUG Using 'application/json', given [application/json, text/plain, */*] and supported [application/json, application/*+json, application/json

```