Modules

Command-Line Operations

```
// compile non-modular code

javac -cp <classpath> -d <directory> <classesToCompile>

javac --class-path <classpath> -d <directory> <classesToCompile>

javac -classpath <classpath> -d <directory> <classesToCompile>


// run non-modular code

java -cp <classpath> <package>.<className>

java -classpath <classpath> <package>.<className>

java --class-path <classpath> <package>.<className>
```

```
// compile module

javac -p <moduleFolderName> -d <directory> <classesToCompilePlusModuleInfo>

javac --module-path <moduleFolderName> -d <directory>

    <classesToCompilePlusModuleInfo>



// run module

java -p <moduleFolderName> -m <moduleName/package.className>

java --module-path <moduleFolderName> --module <moduleName/package.className>
```

```
// describe module

java -p <moduleFolderName> -d <moduleName>

java --module-path <moduleFolderName> --describe-module <moduleName>

jar --file <jarName> --describe-module

jar -f <jarName> -d


// list available modules

java --module-path <moduleFolderName> --list-modules

java -p <moduleFolderName> --list-modules

java --list-modules
```

```
// view dependencies

jdeps -summary --module-path <moduleFolderName> <jarName>

jdeps -s --module-path <moduleFolderName> <jarName>

jdeps --jdk-internals <jarName>

jdeps -jdkinternals <jarName>


// show module resolution

java --show-module-resolution --module-path <moduleFolderName>

    --module <moduleName>

java --show-module-resolution -p <moduleFolderName> -m <moduleName>
```

```
// create runtime JAR

jlink --module-path <moduleFolderName> --add-modules <moduleName>

    --output <directory>

jlink -p <moduleFolderName> --add-modules <moduleName> --output <directory>
```

Using `jmod`

- `JMOD` files are used when you have libraries that can't go inside a `JAR` file

- for the exam you only need to know common modes used by `jmod`

  - `create` – creates JMOD file

  - `extracts` – extracts all files from JMOD (like unzipping)

  - `describe` – prints module details (such as `requires`)

  - `list` – lists all files in JMOD file

  - `hash` – prints or records hashes