

# An exploratory study about extent of use of released packages in the Maven Central Repository

## 1. Background:

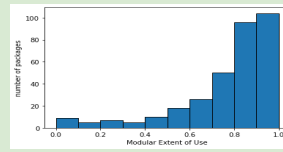
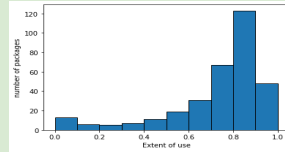
- Maven Central hosts over 9 million repositories
- Studies about Maven reveal defining patterns
- Current studies are mostly focused on popularity and vulnerabilities at package level

## 2. Research Questions:

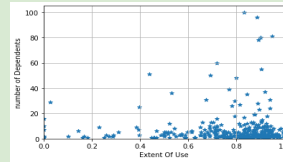
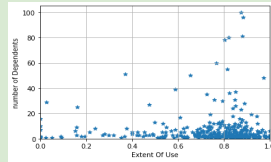
- On average, what extent of a released package version is used by others in Maven Central?
- Is extent of use correlated with the number of dependents?
- Is extent of use at method level correlated with extent of use at module level?

## 5. Results:

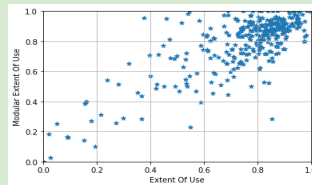
- Below are plotted the distributions of extent of use at method level(left) and module level(right). Extent of use in maven is high, 0.732 at method level and 0.771 at module level



- The number of dependents does not influence extent of use



- Extent of use at method and module level are highly correlated : Pearson correlation coefficient  $r = 0.829$



## 3. Extent of Use:

- Quantifies how much of a package is being used
- At method level: number of non-private methods used divided by number of non-private methods in package
- At module level: number of modules used divided by number of modules in package

## 4. Methodology:

- Perform data selection from packages in FASTEN
- Generate callgraphs using the FASTEN software
- Identify used methods in each dependent and compute extent of use at method level and module level
- Compute average extent of use for each package in dataset and derive results

## 6. Limitations:

- Small sample size compared to number of packages in maven
- Extent of use changes over time