

# Research Project

## D5. Preliminary Results

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**Title:** Effect of Project Dependencies on the Health of the Software Project

Group 1: GVS Bhaskar  
Anudeep Uppu  
Keerthana Vijaykumar  
Sahana Vallu  
Mohanthi Sandeep

# Research Questions

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RQ 1: How does packages affect the health of project dependencies?

a: How does deprecated packages affect the health of project dependencies?

b: What are the compatibility issues involved in the upgradation of project dependencies in the future?

# Data Collection Method

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As part of data collection we have done the following:

Step 1 :

- We considered the repositories from 2010 till current date having Javascript projects with package.json file.
- We considered 10 pages assuming 100 entries per page which resulted to 926 entries in total.

# Data Collection Method Contd...

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## Step 2 :

For our preliminary analysis we considered the repositories:

- Which had greater than average of forks and watchers as we are considering the projects which are popular and could have more dependency on these projects.
- Hence, we considered 926 entries/repositories out of which 425 repositories had greater than the average of forks and watchers on which our further analysis was performed.
- We have considered the following columns and performed the analysis assuming that there could be some correlation between these factors: ['id','name','full\_name','html\_url','url','size','language','forks','open\_issues','visibility','watchers','created\_at','updated\_at','pushed\_at']

# Data Collection Method Contd...

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## Step 3 :

- We picked each repository and checked the packages present in their package.json file upto 2 levels.

## Pseudocode :

for each repository in list\_of\_repositories:

1. check for package.json file
2. check for the outdated packages, upgradable packages
3. increment their respective counts

- If we found out a deprecated/outdated package we incremented its count by 1 and packages which needed an upgrade to its latest version had an upgrade increment count.
- Finally, we would display the current version of the package and also give the information about the latest version of the package.

# Results

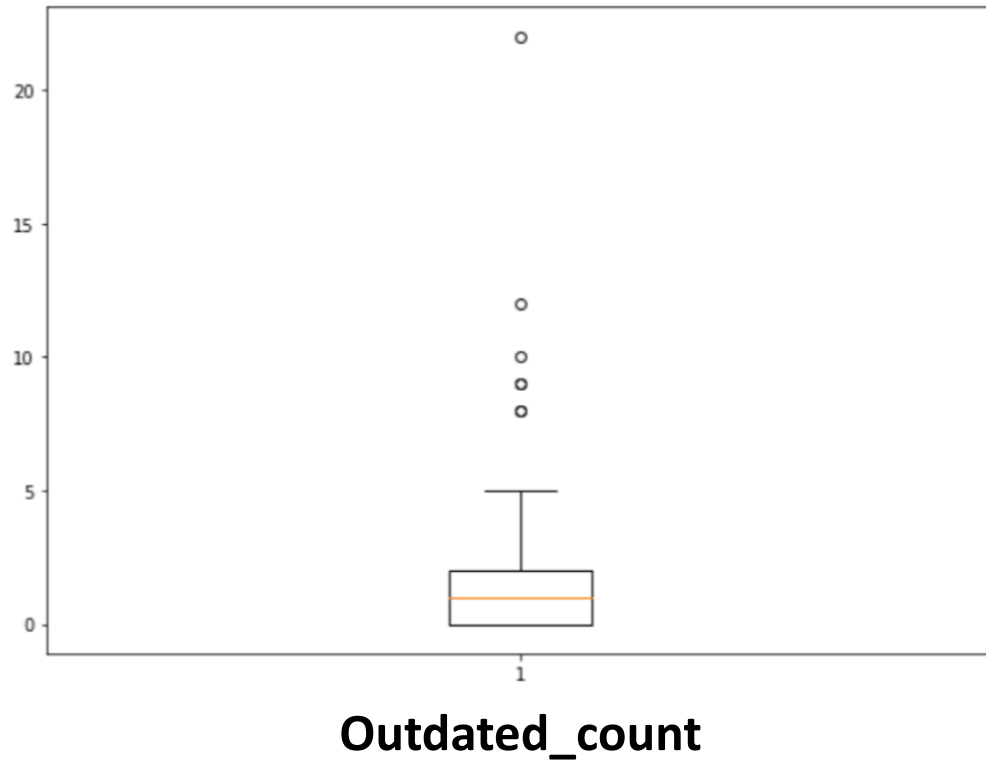
## Descriptive Statistics

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df.describe()										
	Unnamed: 0	id	size	forks	open_issues	watchers	up_to_date_count	upgradation_count	outdated_count	total_count
count	100.000000	1.000000e+02	100.000000	100.000000	100.000000	100.000000	100.000000	100.000000	100.000000	100.000000
mean	52.600000	4.289674e+07	7691.860000	191.750000	31.900000	1208.650000	7.520000	11.090000	1.240000	19.850000
std	33.609462	5.706982e+07	24654.251553	177.248121	57.896547	656.049708	15.961114	21.019517	3.153065	36.296026
min	0.000000	3.432500e+05	19.000000	15.000000	0.000000	759.000000	0.000000	0.000000	0.000000	0.000000
25%	24.750000	8.214737e+06	463.250000	75.750000	8.000000	838.500000	0.000000	0.000000	0.000000	0.000000
50%	49.500000	2.174454e+07	1209.000000	127.500000	15.000000	977.500000	0.000000	0.500000	0.000000	1.000000
75%	74.250000	5.379215e+07	3871.500000	255.500000	30.000000	1359.000000	4.000000	12.500000	1.000000	20.000000
max	115.000000	3.483244e+08	189651.000000	1036.000000	364.000000	5228.000000	96.000000	114.000000	22.000000	173.000000

# Results Contd..

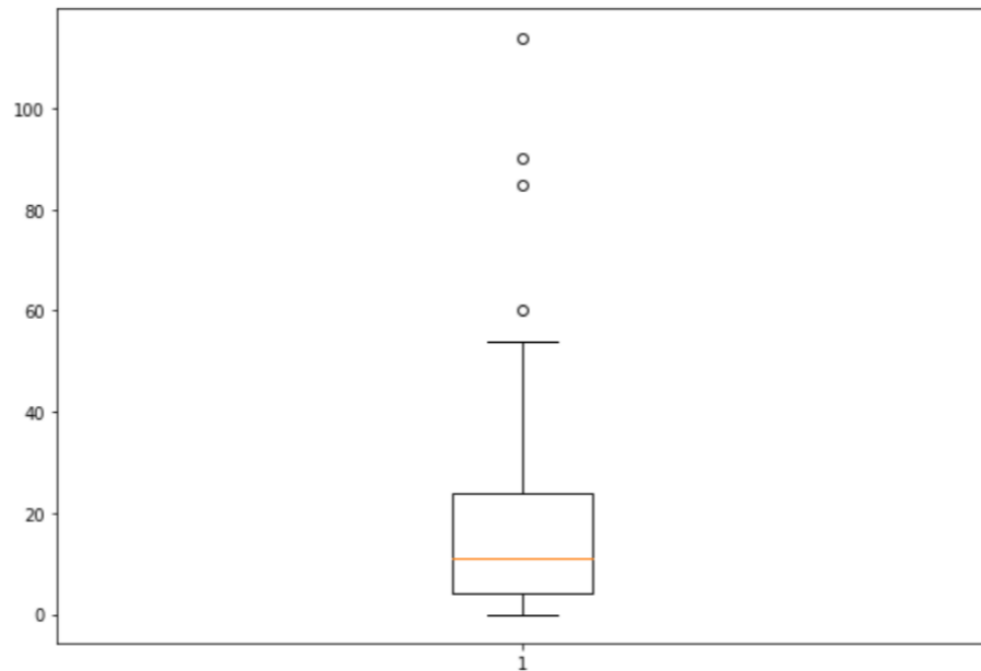
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The box-plot on the left shows the results obtained from the data analysis of the outdated packages.

# Results cont..

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**Upgradation\_count**

The box plot here shows the results obtained from our data analysis of the packages that need to be updated.



# Results cont..

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## ▼ Correlation

```
✓ [3] df["outdated_count"].corr(df["open_issues"])  
0s  
0.03432819962268614
```

```
✓ [5] df["upgradation_count"].corr(df["open_issues"])  
0s  
-0.006383696366829403
```

```
✓ [6] df["up_to_date_count"].corr(df["open_issues"])  
0s  
-0.05504494095246603
```

During our analysis, we observed a small correlation when we tried to compare open\_issues with the dependency counts.

Therefore, we are further tuning our methods to obtain better results.

*Thank You*