

inout

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The Graph Structure of Public Software Development

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TODO: Add citation string

1 Replication Package : In/Out Degree Distributions

```
[1]: from pathlib import Path
import matplotlib.pyplot as plt
import numpy as np
import common

DATASET = Path('../experiments/inout')
DISTRIBUTIONS = [
    'cnt_in_dir',
    'dir_in_all',
    'dir_in_dir',
    'dir_in_rev',
    'dir_out_all',
    'dir_out_cnt',
    'dir_out_dir',
    'dir_out_rev',
    'ori_out_snp',
    'rel_in_snp',
    'rev_in_all',
    'rev_in_dir',
    'rev_in_rel',
    'rev_in_rev',
    'rev_in_snp',
    'rev_out_rev',
    'snp_in_ori',
```

```

'snp_out_all',
'snp_out_rel',
'snp_out_rev',
]

def show_distribution(name):
    src, direction, dst = name.split('_')
    title = "{} of {} {} {}".format(
        ("Indegrees" if direction == 'in' else "Outdegrees"),
        common.types_verbose[src],
        ("from" if direction == 'in' else "to"),
        common.types_verbose[dst],
    )

    x, y = common.load_text_distribution(DATASET / 'per_type' / (name + '.txt'))
    dist = common.Distribution(x, y, "Degree", "Number of nodes", title)

    common.plot_all(dist, 'figures/inout', name)

```

2 Layers

```

[4]: def show_distribution_layer(name, direction):
    title = "{} ({} )".format(
        ("Indegrees" if direction == 'in' else "Outdegrees"),
        common.LAYERS[name],
    )

    x, y = common.load_text_distribution(DATASET / ('{}_{}.txt'.format(name,
→direction)))
    dist = common.Distribution(x, y, "Degree", "Number of nodes", title)
    print("Average degree of {}: {}".format(name, sum(degree * count for degree,
→count in zip(x, y)) / sum(y)))

    common.plot_all(dist, 'figures/inout', '{}_{}'.format(name, direction))

```

```

[6]: show_distribution_layer('full', 'in')
show_distribution_layer('full', 'out')

show_distribution_layer('dir+cnt', 'in')
show_distribution_layer('dir+cnt', 'out')

show_distribution_layer('rev', 'in')
show_distribution_layer('rev', 'out')

```

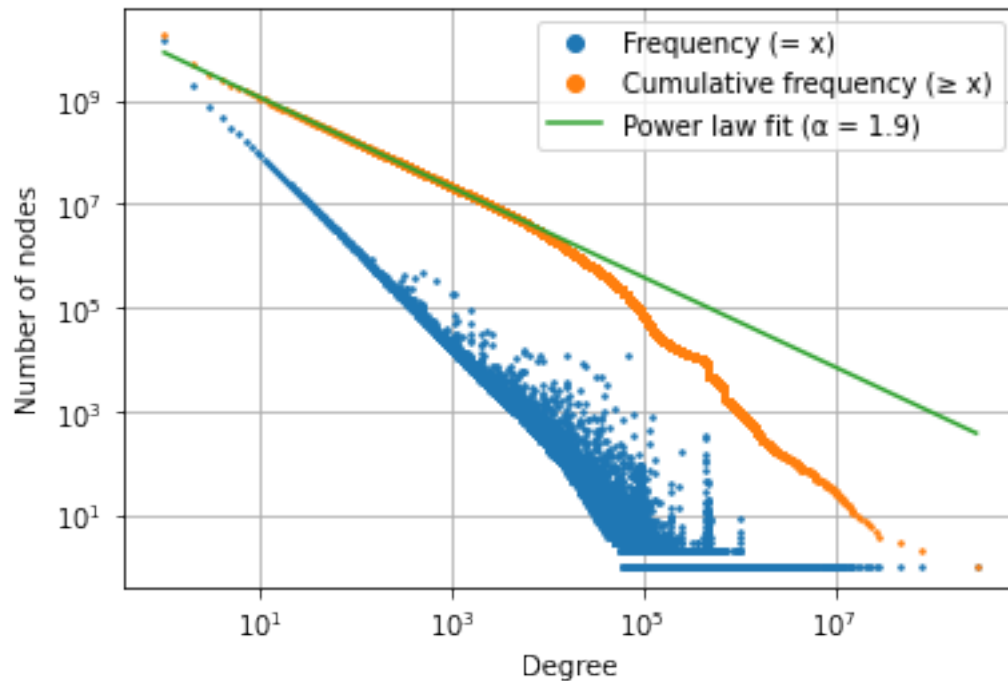
```

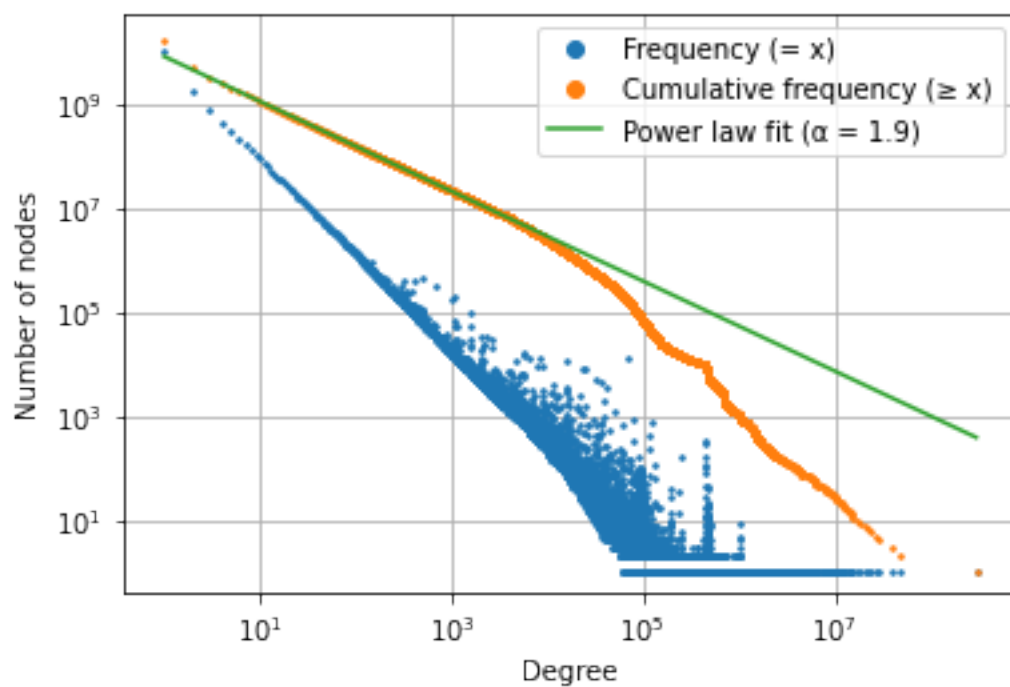
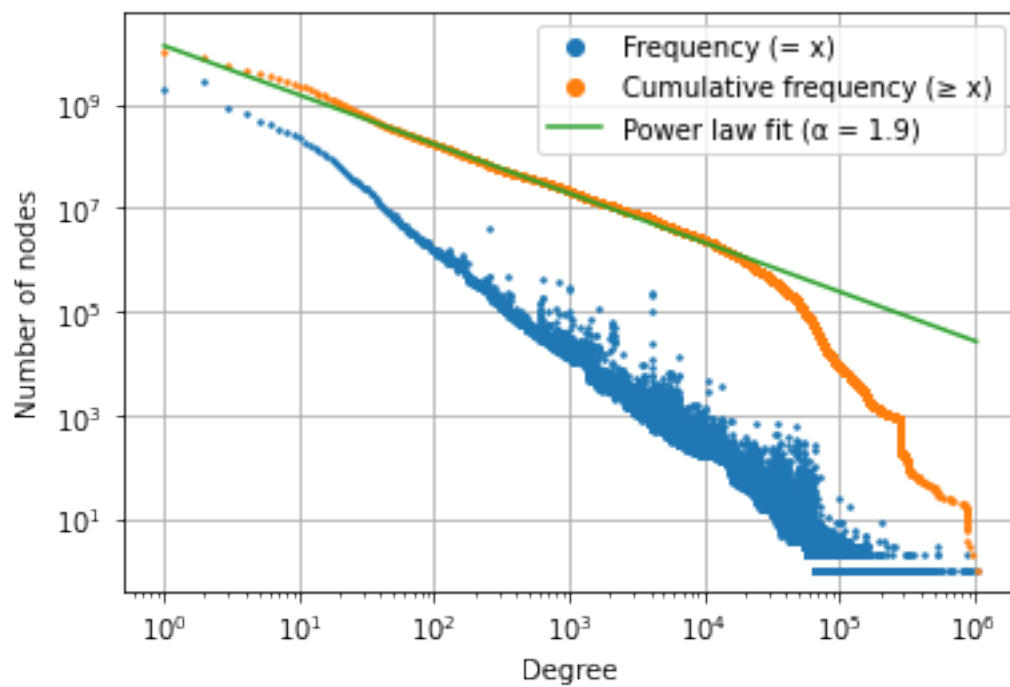
show_distribution_layer('rel+rev', 'in')
show_distribution_layer('rel+rev', 'out')

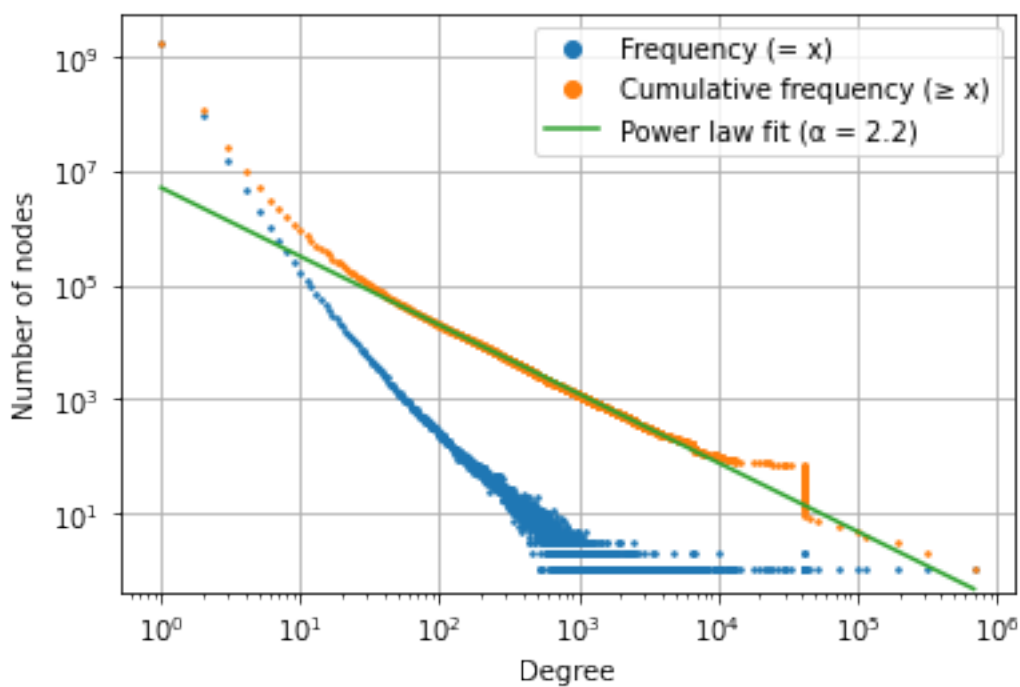
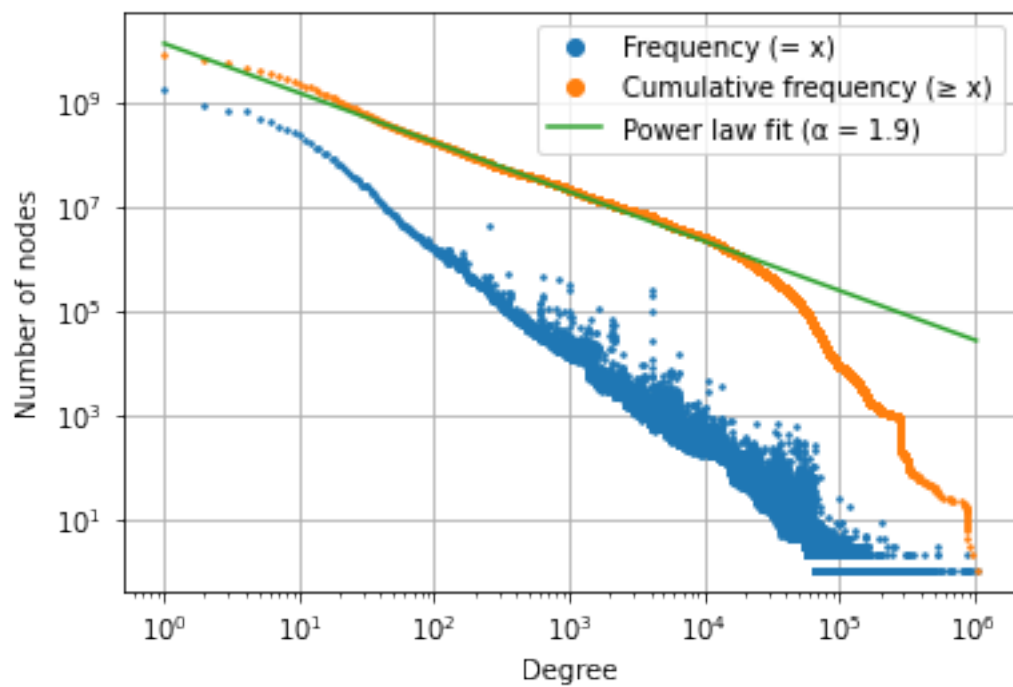
show_distribution_layer('ori+snp', 'in')
show_distribution_layer('ori+snp', 'out')

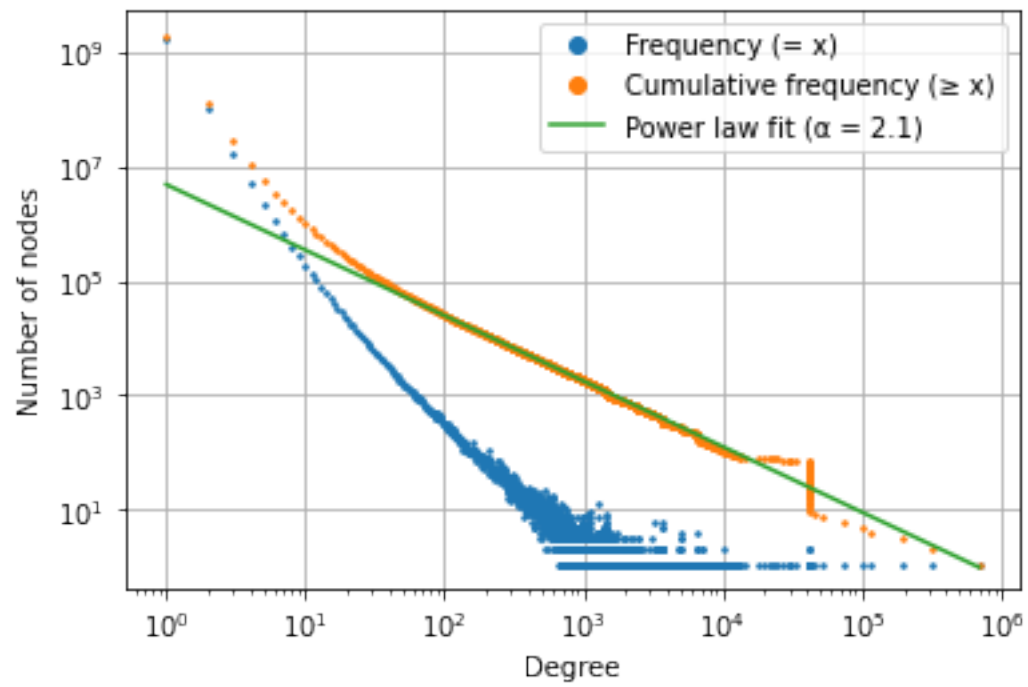
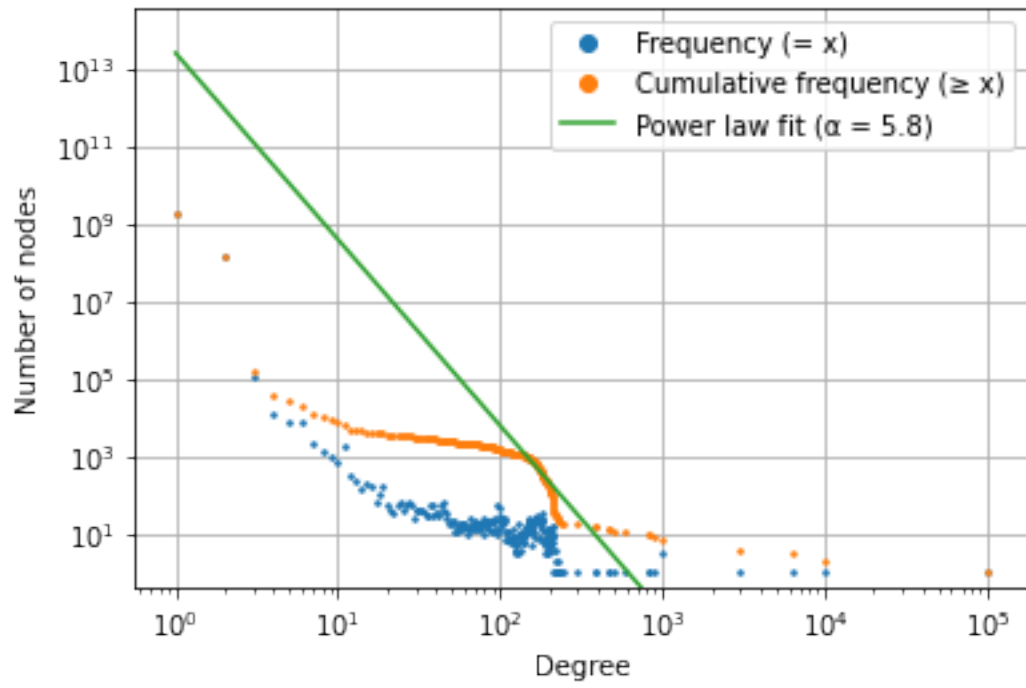
```

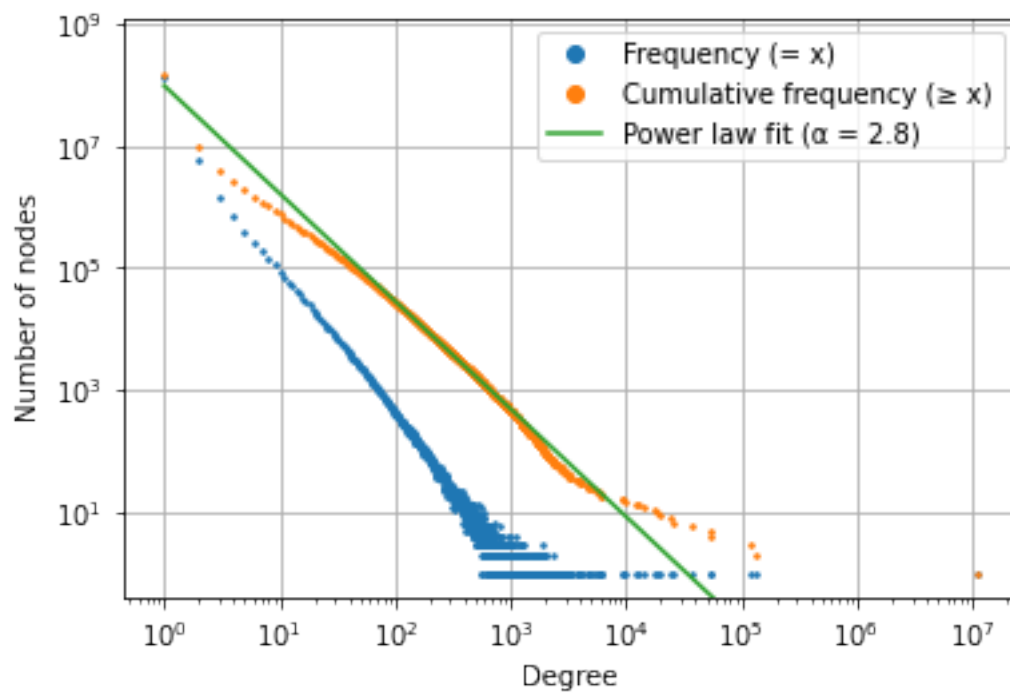
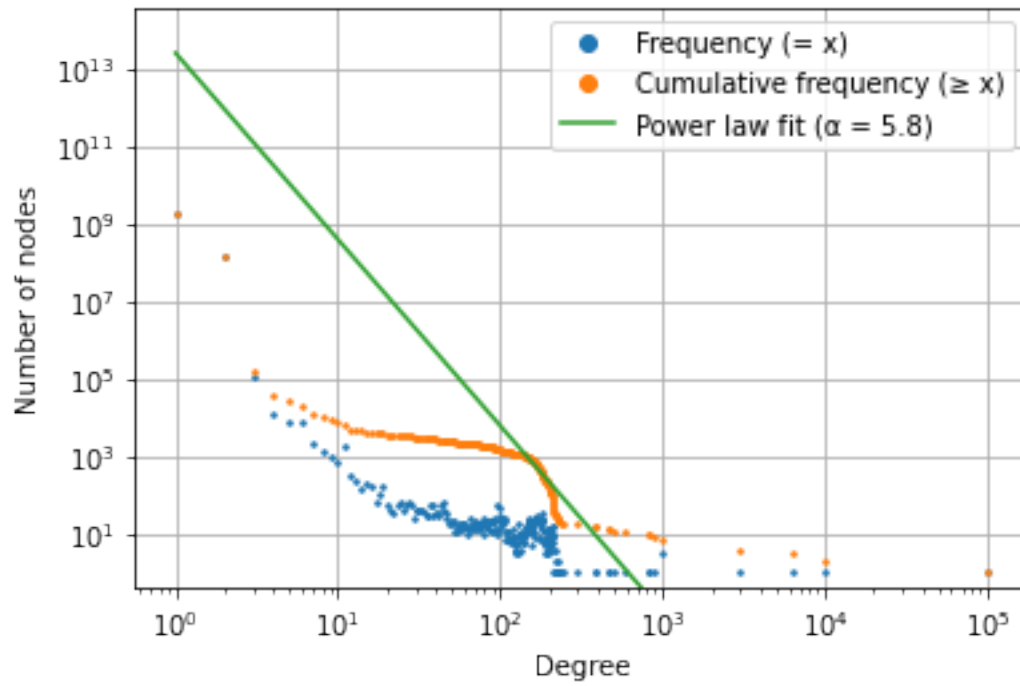
Average degree of full: 11.062626411698927
 Average degree of full: 11.062626411698927
 Average degree of dir+cnt: 12.141389244664333
 Average degree of dir+cnt: 12.141389059449143
 Average degree of rev: 1.022002649601302
 Average degree of rev: 1.022002649601302
 Average degree of rel+rev: 1.021796658939633
 Average degree of rel+rev: 1.021817215224544
 Average degree of ori+snp: 0.658996210014574
 Average degree of ori+snp: 7.0855709984027815

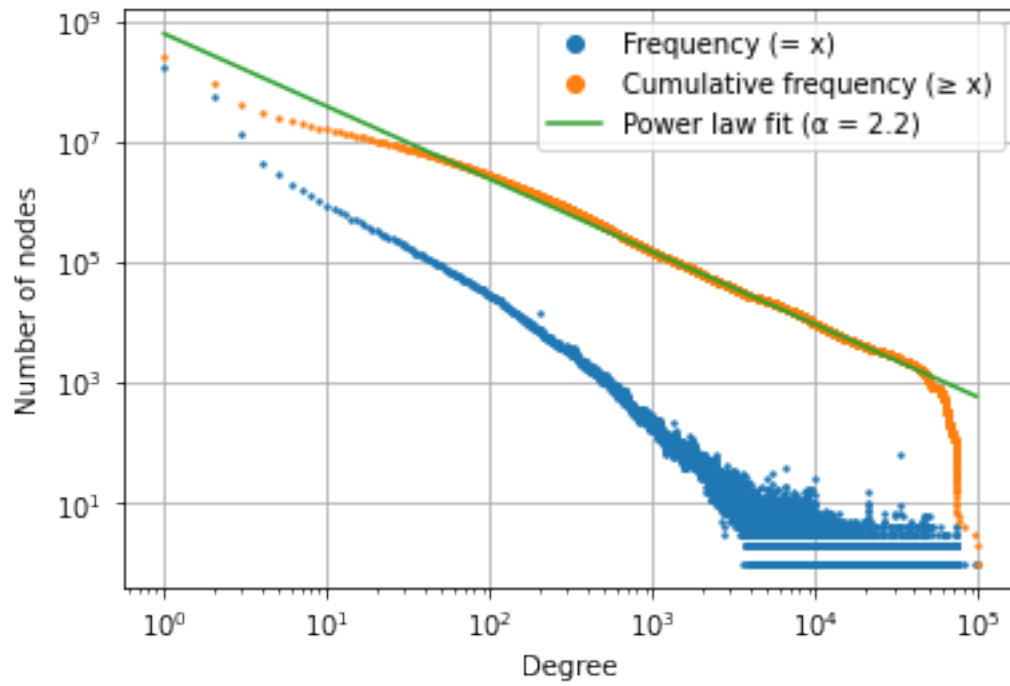








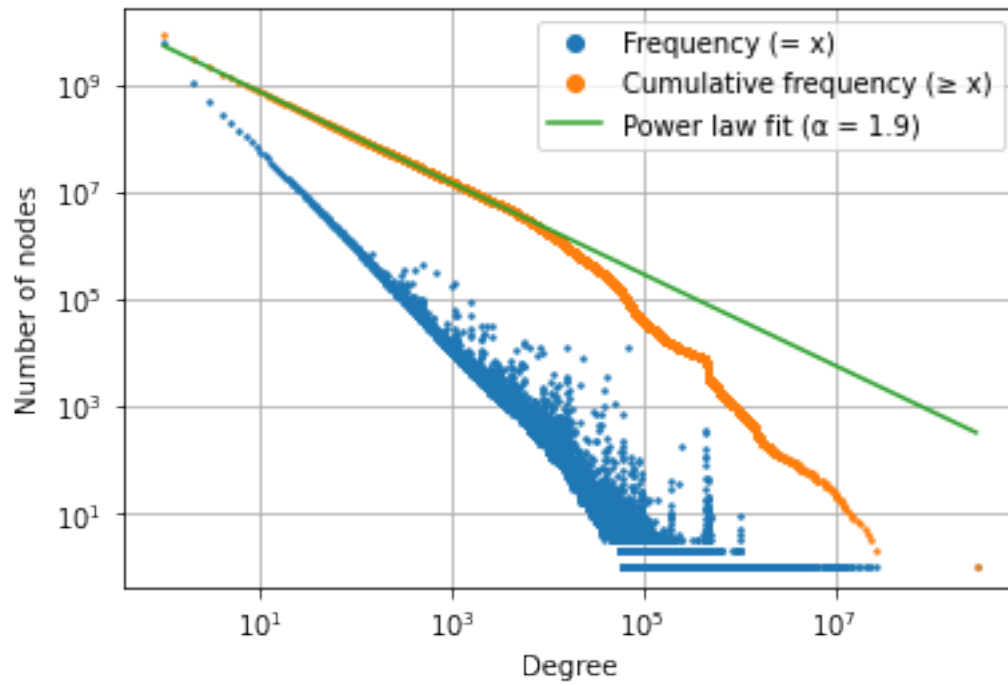




3 Contents

3.1 Indegrees

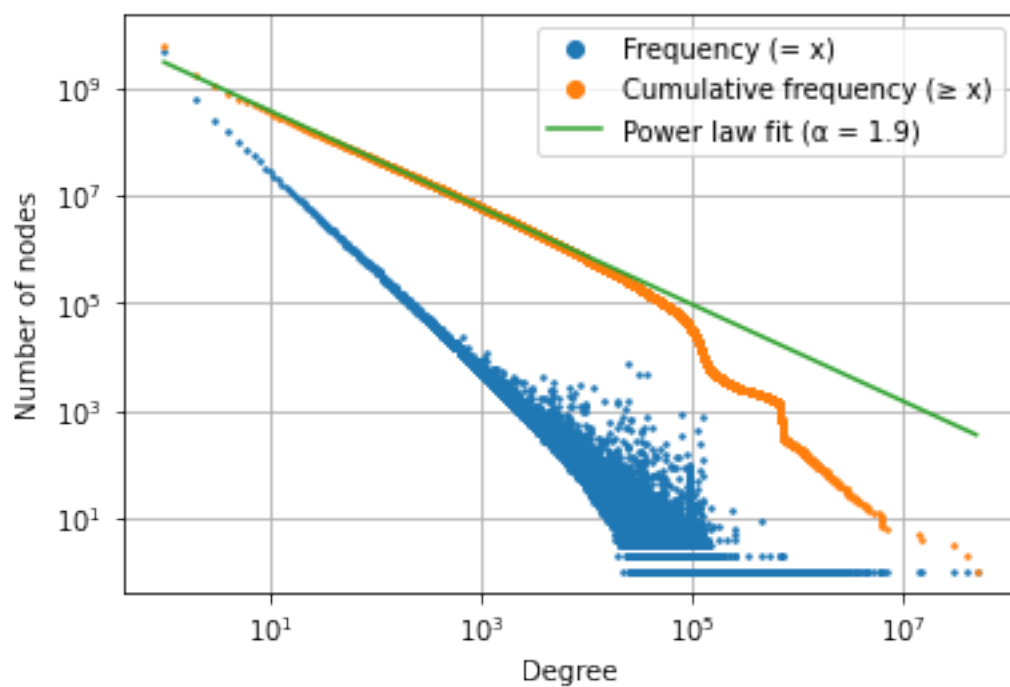
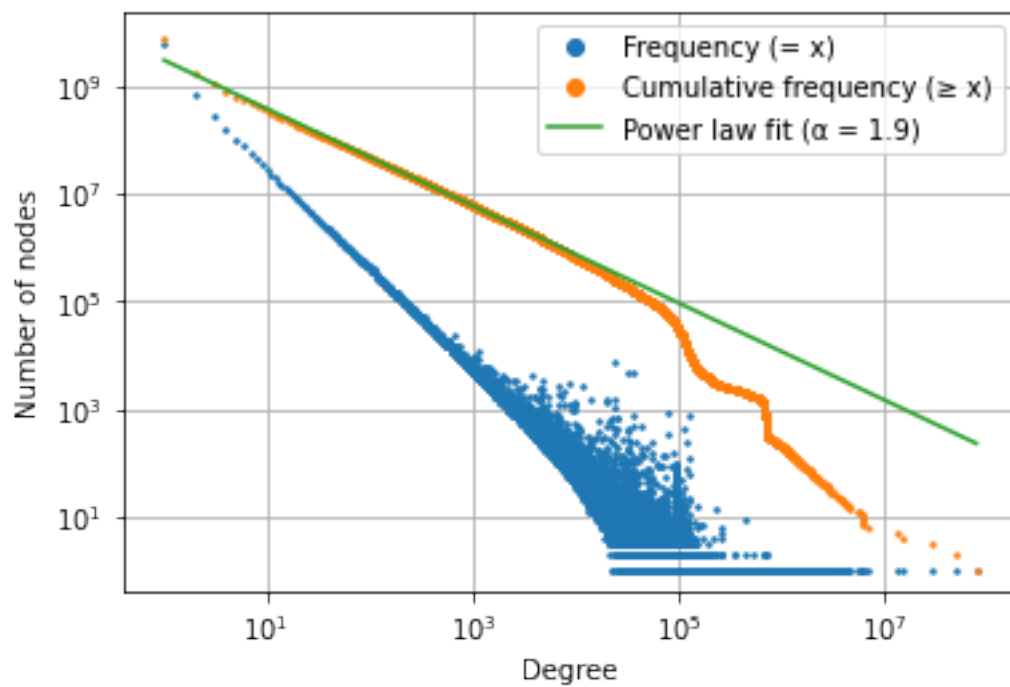
```
[4]: show_distribution('cnt_in_dir')
```

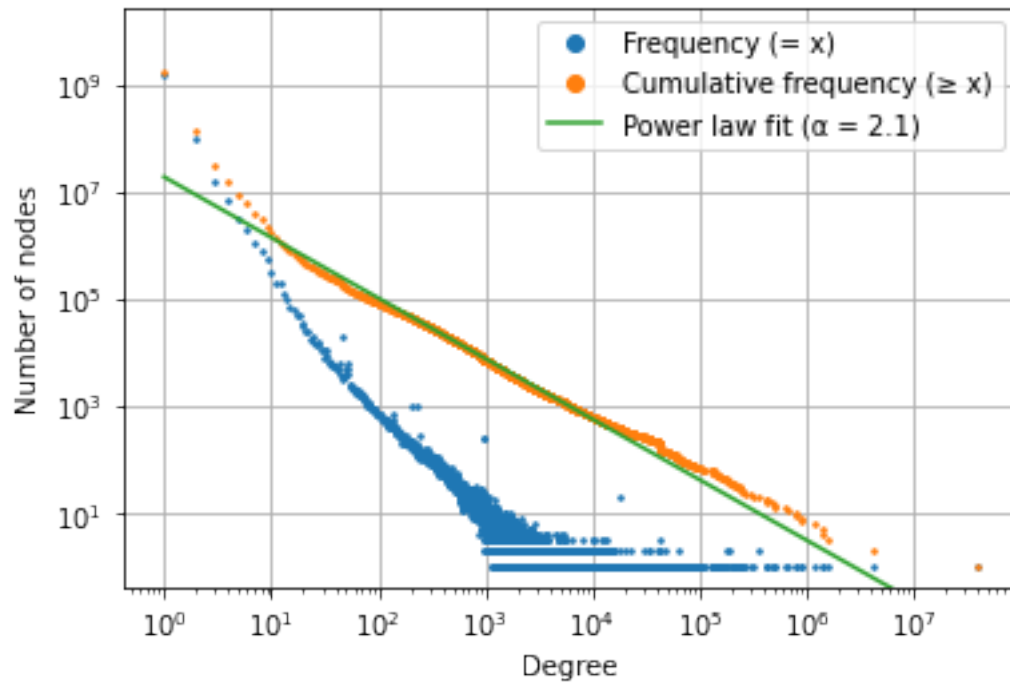



4 Directories

4.1 Indegrees

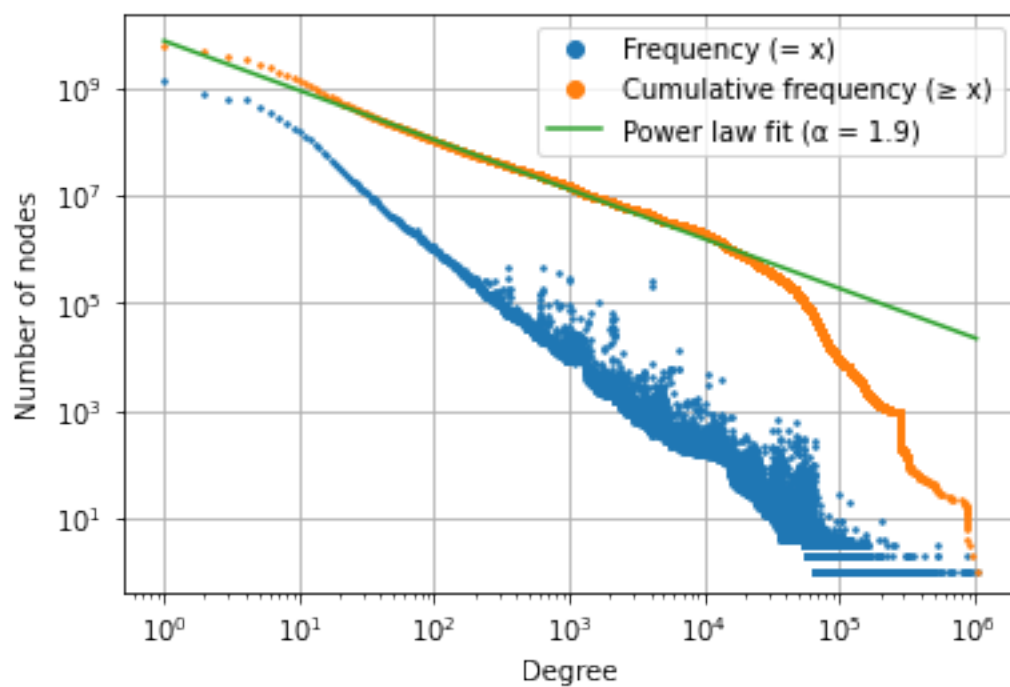
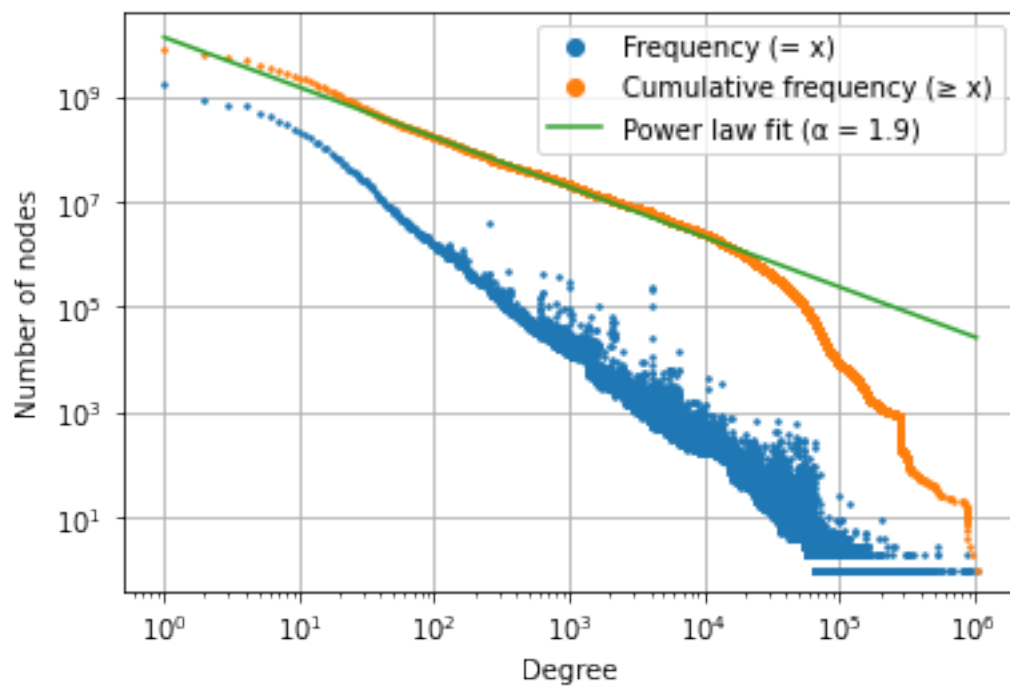
```
[5]: show_distribution('dir_in_all')  
      show_distribution('dir_in_dir')  
      show_distribution('dir_in_rev')
```

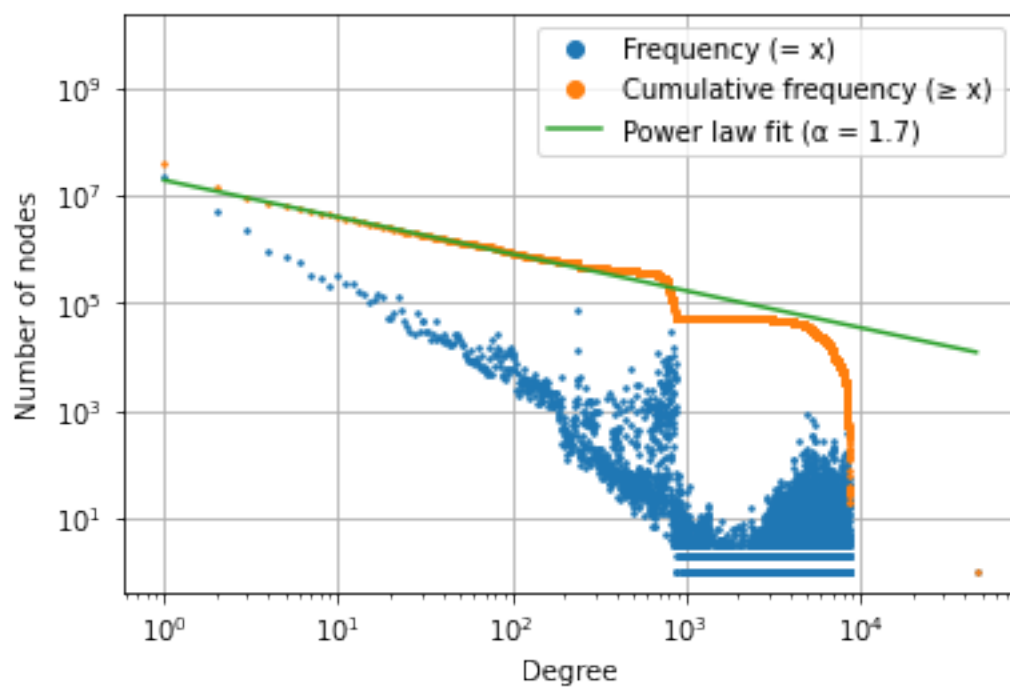
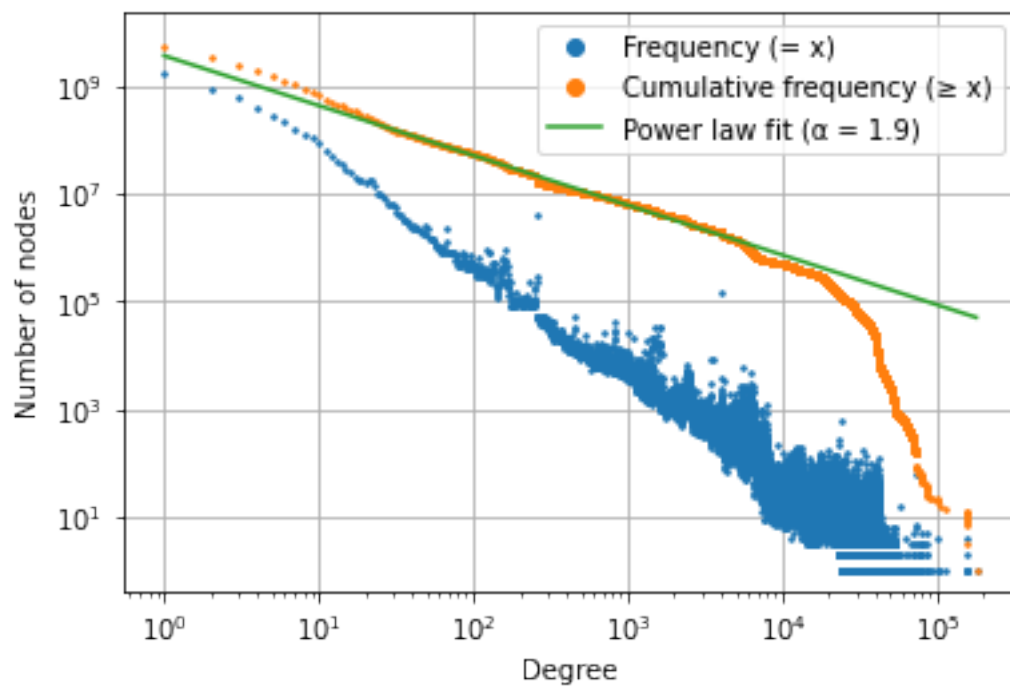




4.2 Outdegrees

```
[6]: show_distribution('dir_out_all')  
     show_distribution('dir_out_cnt')  
     show_distribution('dir_out_dir')  
     show_distribution('dir_out_rev')
```

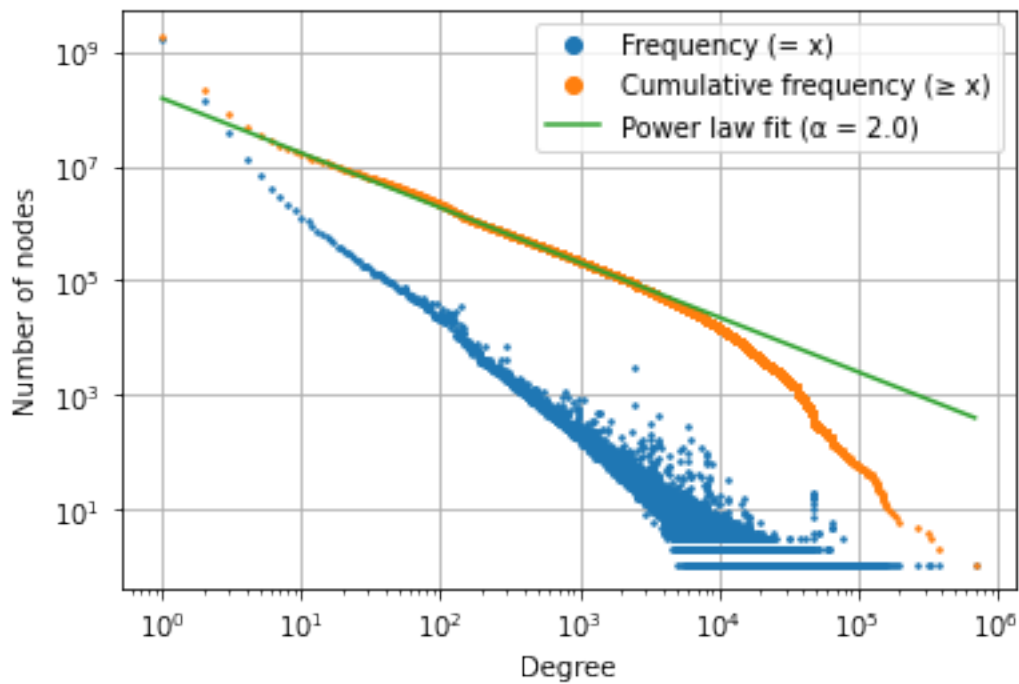


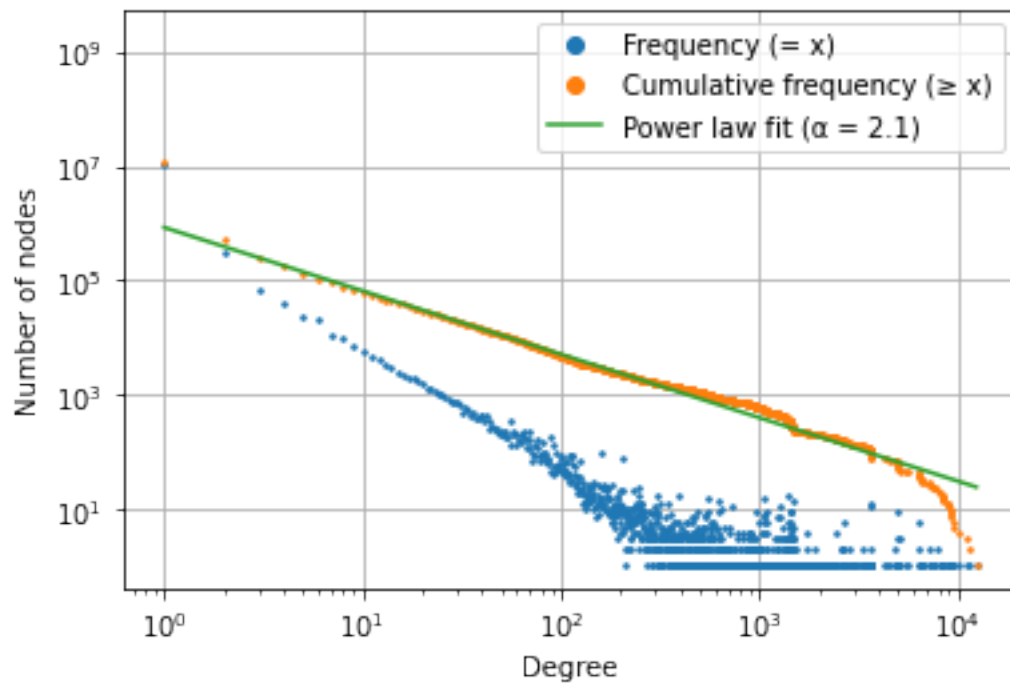
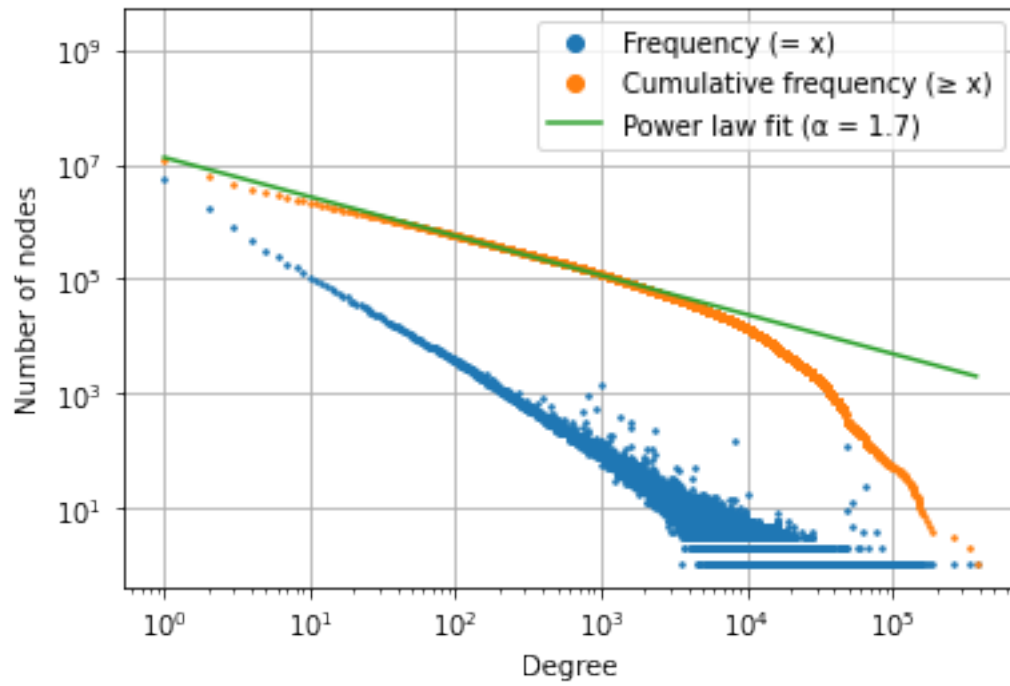


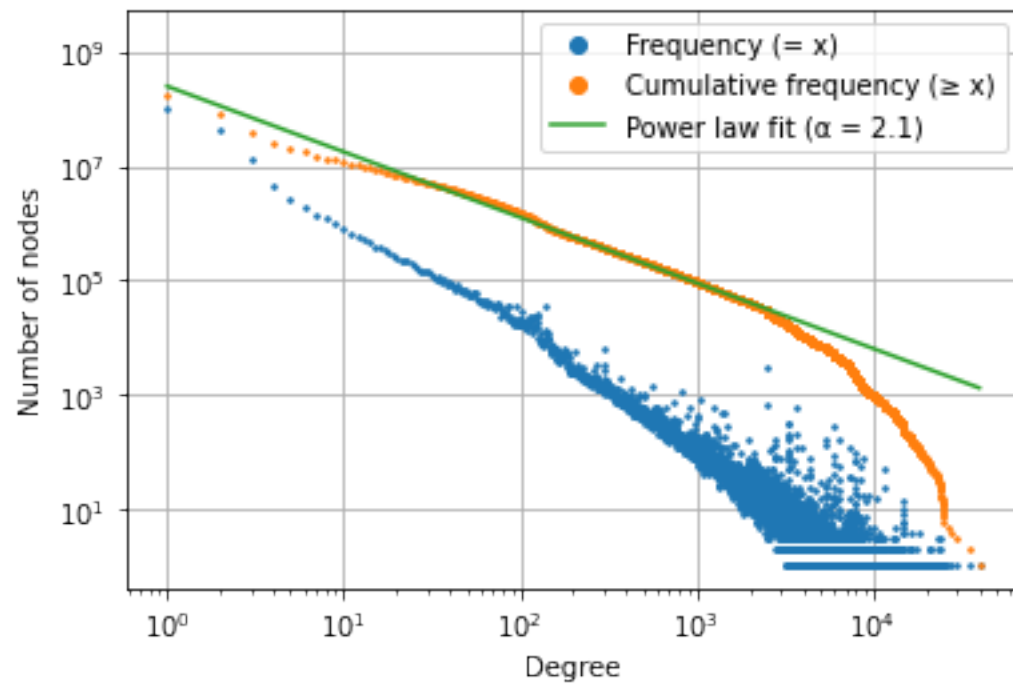
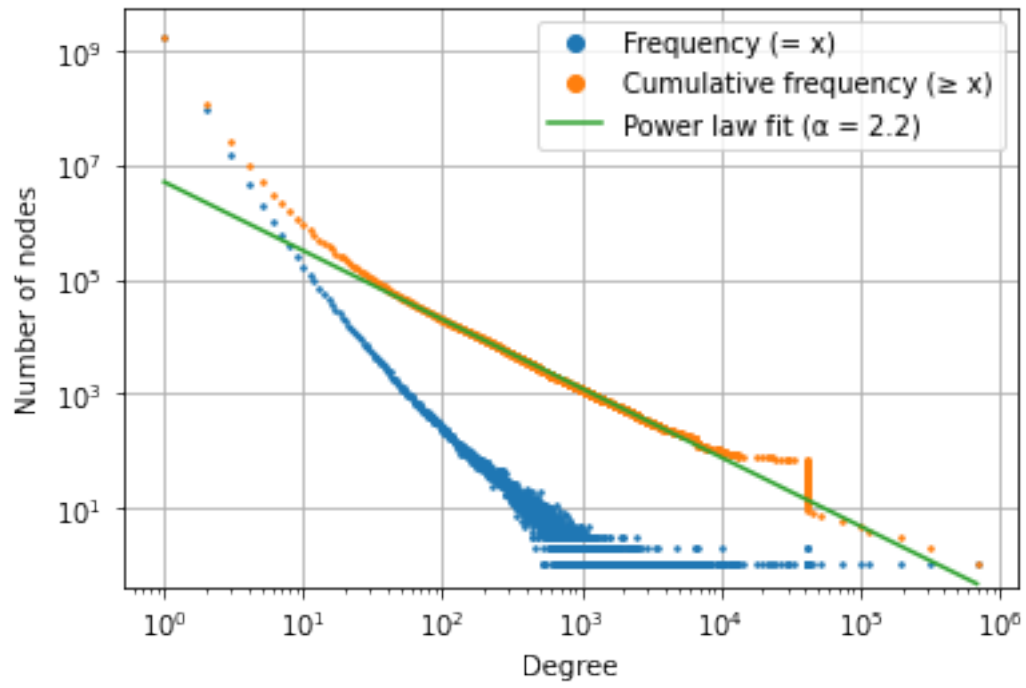
5 Revisions

5.1 Indegrees

```
[7]: show_distribution('rev_in_all')  
show_distribution('rev_in_dir')  
show_distribution('rev_in_rel')  
show_distribution('rev_in_rev')  
show_distribution('rev_in_snp')
```

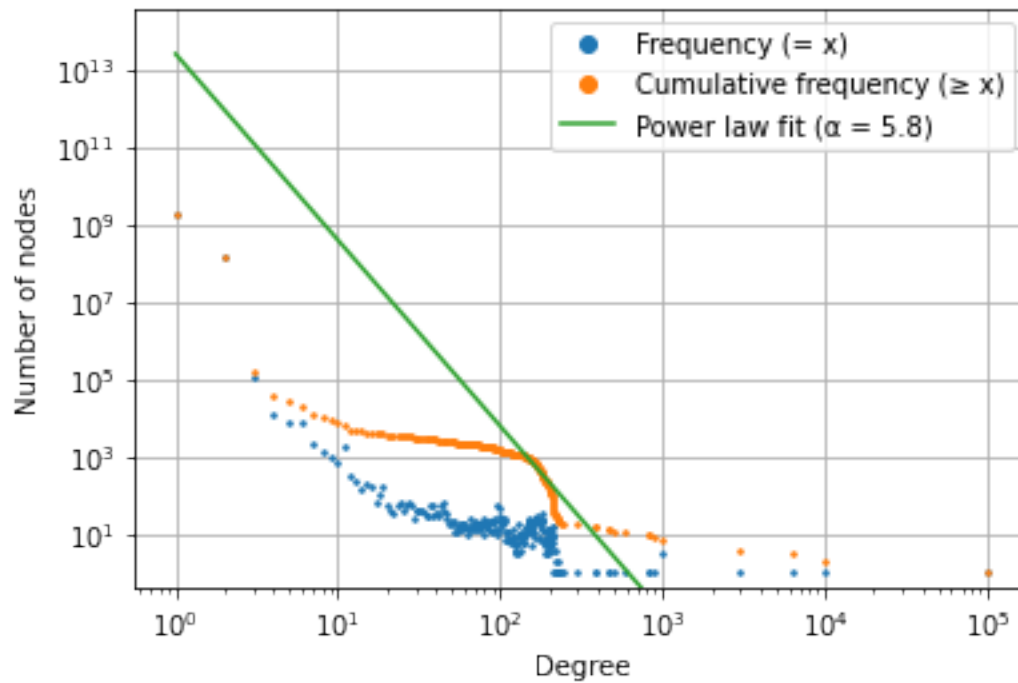






5.2 Outdegrees

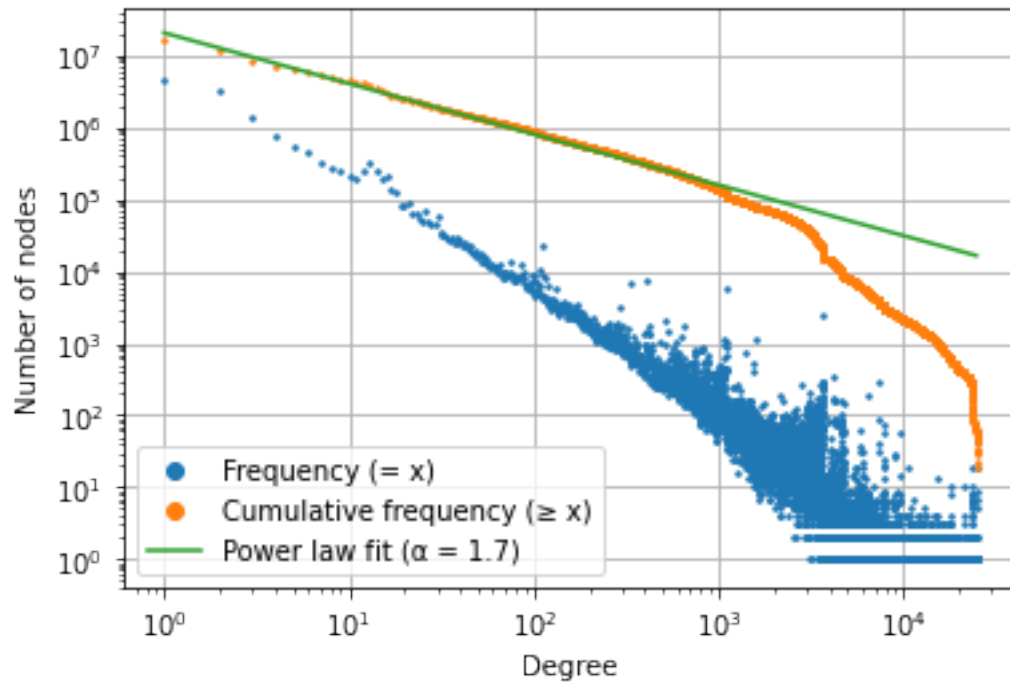
```
[8]: show_distribution('rev_out_rev')
```



6 Releases

6.1 Indegrees

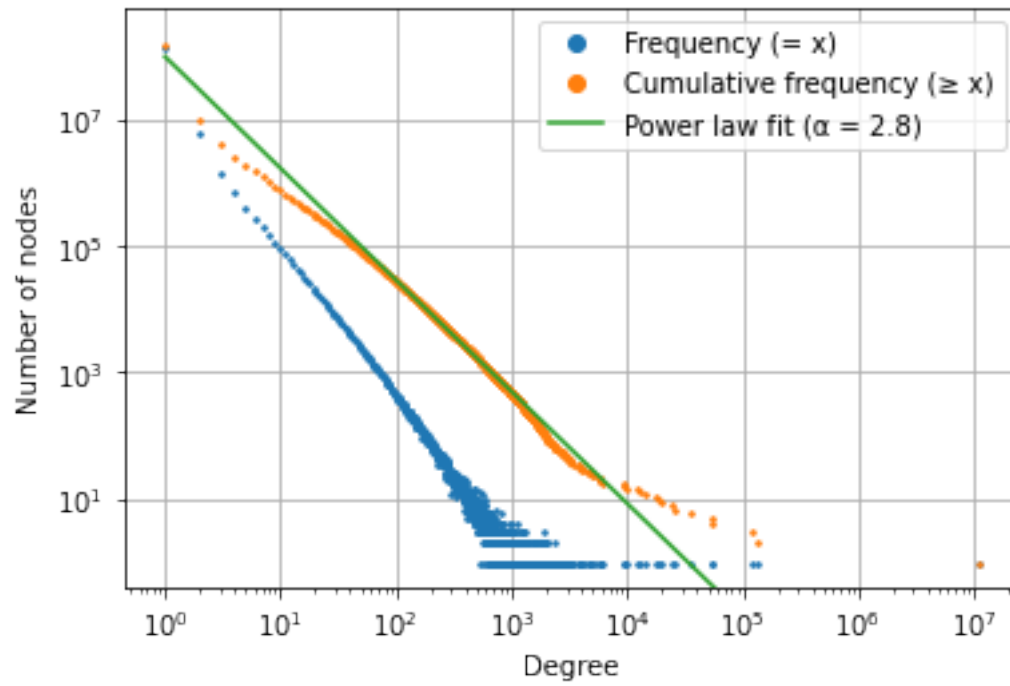
```
[9]: show_distribution('rel_in_snp')
```



7 Snapshots

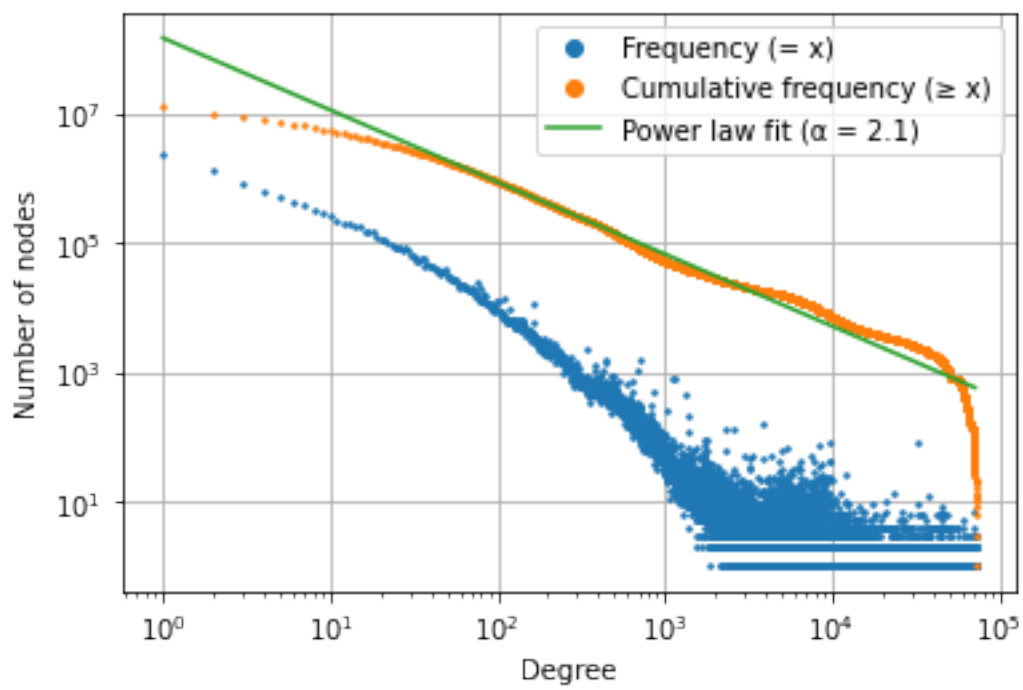
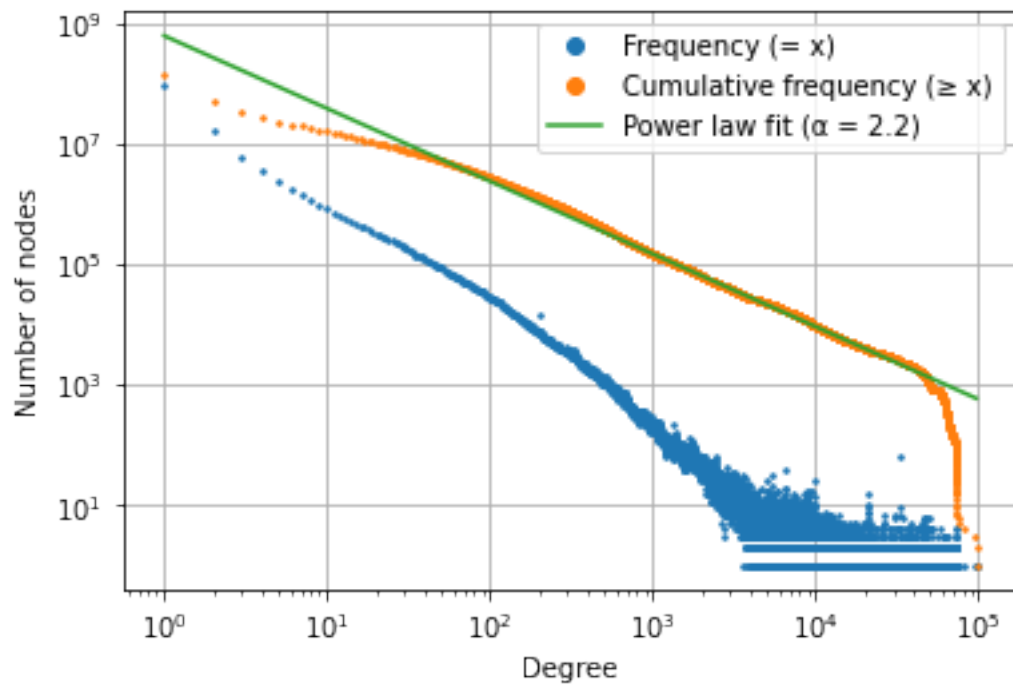
7.1 Indegrees

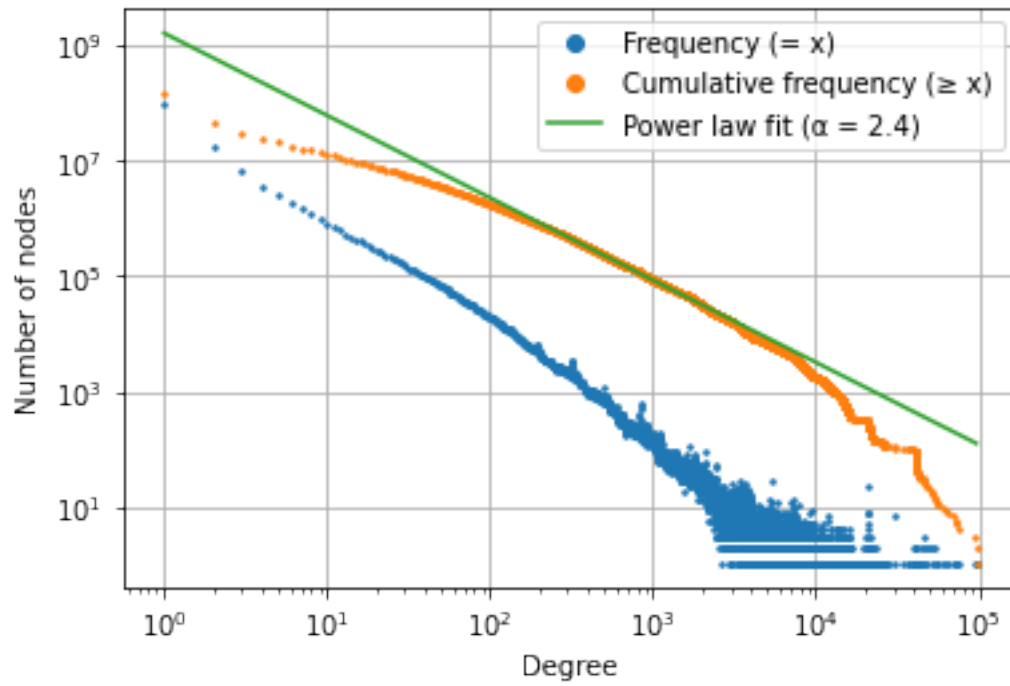
```
[10]: show_distribution('snp_in_ori')
```



7.2 Outdegrees

```
[11]: show_distribution('snp_out_all')  
      show_distribution('snp_out_rel')  
      show_distribution('snp_out_rev')
```

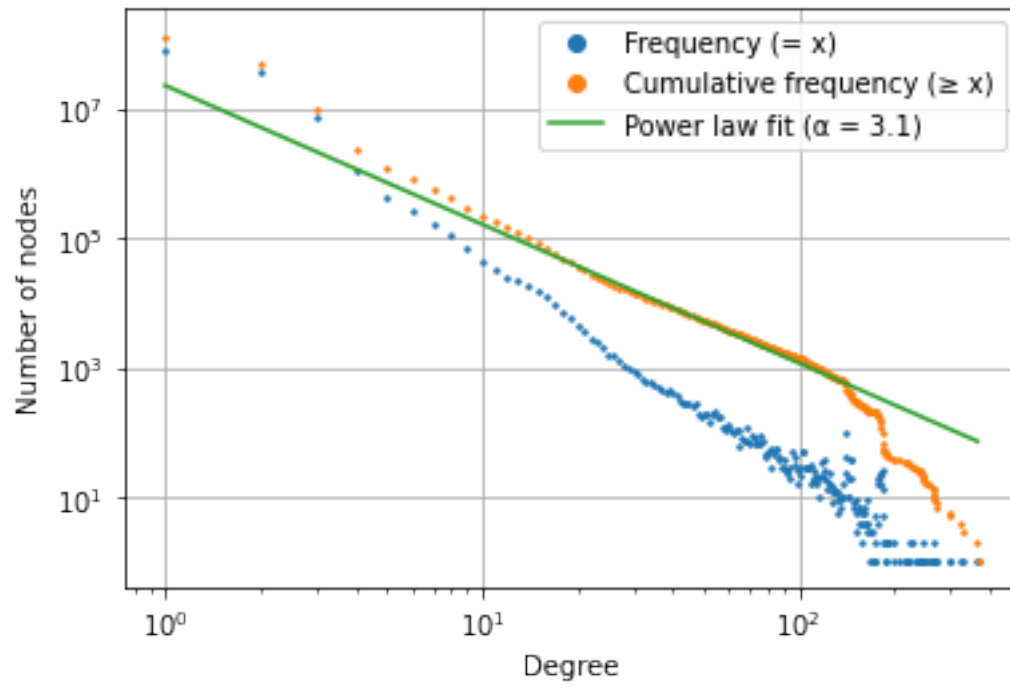




8 Origins

8.1 Outdegrees

```
[12]: show_distribution('ori_out_snp')
```



[]:

[]: