

USAGE EXAMPLES

1. RQ1

To replicate our results for RQ1, please use:

```
python3 analyze_data.py
```

The expected result shows below:

```
[root@2fe0dc840b5b:/workspace/Chronos# python3 analyze_data.py ]
[2014 2015 2016 2017 2018 2019]
org.apache.ant ant
2811
=====
2015
seen: 312
unseen: 344
unseen dp: 292/981 = 0.2976554536187564
seen dp: 551/981 = 0.5616717635066258
remain dp: 138/981 = 0.14067278287461774
=====
2016
seen: 345
unseen: 551
unseen dp: 447/1347 = 0.33184855233853006
seen dp: 704/1347 = 0.5226429101707498
remain dp: 196/1347 = 0.14550853749072012
=====
2017
seen: 369
unseen: 725
unseen dp: 837/1814 = 0.46141124586549065
seen dp: 896/1814 = 0.49393605292171994
remain dp: 81/1814 = 0.044652701212789414
=====
2018
seen: 451
unseen: 643
unseen dp: 640/1718 = 0.37252619324796277
seen dp: 872/1718 = 0.5075669383003493
remain dp: 206/1718 = 0.119906868451688
=====
2019
seen: 313
unseen: 338
unseen dp: 458/1022 = 0.4481409001956947
seen dp: 498/1022 = 0.487279843444227
remain dp: 66/1022 = 0.06457925636007827
```

Figure 1 The expected results for python3 analyze_data.py

2. RQ2

To replicate our results for RQ2, please use:

```
bash auto_run.sh -d 'description_and_reference' -l 'splitting' -m 8 -i 10
```

The expected result shows below:

```
K = 1
P@1 = 0.7467153284671533
R@1 = 0.613912464264231
F@1 = 0.6738328437094417
K = 2
P@2 = 0.8005474452554745
R@2 = 0.7506077692032517
F@2 = 0.7747736995285237
K = 3
P@3 = 0.8187347931873487
R@3 = 0.7883986925452013
F@3 = 0.8032804321738715
K = 100
P@100 = 0.9144799693526374
R@100 = 0.9144799693526374
F@100 = 0.9144799693526374
```

Figure 2 The expected results for bash auto_run.sh -d 'description_and_reference' -l 'splitting' -m 8 -i 10

3. RQ3

To replicate our results for RQ3, please use:

Chronos without adjustment

```
bash auto_run.sh -d 'description_and_reference' -l 'splitting' -m 0 -i 0
```

The expected result shows below:

```
Real time : 0:00.89
Max RAM : 98920 KB
Percent CPU : 387%
Loading files
3111it [00:00, 297001.86it/s]
2740it [00:00, 358823.31it/s]
loaded bin file in buffer
K = 1
P@1 = 0.5992700729927007
R@1 = 0.4942135869570414
F@1 = 0.541695176941817
K = 2
P@2 = 0.7034671532846716
R@2 = 0.666376925768957
F@2 = 0.6844199075695343
K = 3
P@3 = 0.7329683698296837
R@3 = 0.7086987015691436
F@3 = 0.7206292524744021
TOTAL LABELS: 6350
How many unseen labels:
886
```

Figure 3 The expected results for bash auto_run.sh -d 'description_and_reference' -l 'splitting' -m 0 -i 0

Chronos without data enhancement

```
bash auto_run.sh -d 'merged' -l 'none' -m 8 -i 10
```

The expected result shows below:

```

K = 1
P@1 = 0.6992700729927007
R@1 = 0.5704908165812598
F@1 = 0.6283500432688456
K = 2
P@2 = 0.745985401459854
R@2 = 0.6991300488077381
F@2 = 0.7217981235145111
K = 3
P@3 = 0.7664233576642339
R@3 = 0.7386867450151923
F@3 = 0.7522994821026608
K = 100
P@100 = 0.8829147447606879
R@100 = 0.8829147447606879
F@100 = 0.8829147447606879
```

Figure 4 The expected results for bash auto_run.sh -d 'merged' -l 'none' -m 8 -i 10