

Project – 3 : Implementation of Flow-Size Sketches

The following project contains a zip file, which consists of 3 source code files(java) which contains the logic for implementing Count Min, Counter Sketch and Active Counter algorithms and corresponding output text files.

Below are the steps which guides to run the project on command line to the functionality of the algorithms mentioned above.

1) Launch the terminal application and go to the "src" folder of the project.

2) Begin by executing the following commands:

"javac P3_CountMin.java", "java P3_CountMin" and

"javac P3_CounterSketch.java", "java P3_CounterSketch" and

"javac P3_ActiveCounter.java", "java P3_ActiveCounter" and

"javac P3_FlowHandler.java", "java P3_FlowHandler" and

"javac P2_Sketches.java", "java P2_Sketches"

3) Executing these commands will result in the creation of output files in the "src" directory and, if those files already exist, will replace them.

1. CountMin.java:

In this algorithm, we try to find the smallest error value for the size of the flows by maintaining multiple arrays and update the value corresponding to each hashed flow ID to the respective index value of the counter array.

2. CounterSketch.java:

In this algorithm, we assign the flow size with either positive error or negative error by hashing the flow ID with the random number and considering MSB of the resultant to be compared with '1' and evaluate to either of the choices, this produces the median of the median value of the packet sizes.

3. ActiveCounter.java:

In this algorithm, we use to represent the counter as number and exponent parts and we increment the counter value probabilistically using the formula $1/2^{\text{counter_exp}}$, this provides us to track the sizes using less space.

This project is tested out on both IntelliJ and command line for execution, and below are the screenshots for the outputs. Project starts when above commands is run and contains the calls to the methods to execute CM.countMinSketch, CU.counterUpdateSketch and AC.activeCounterSketch.

Output Screenshots:

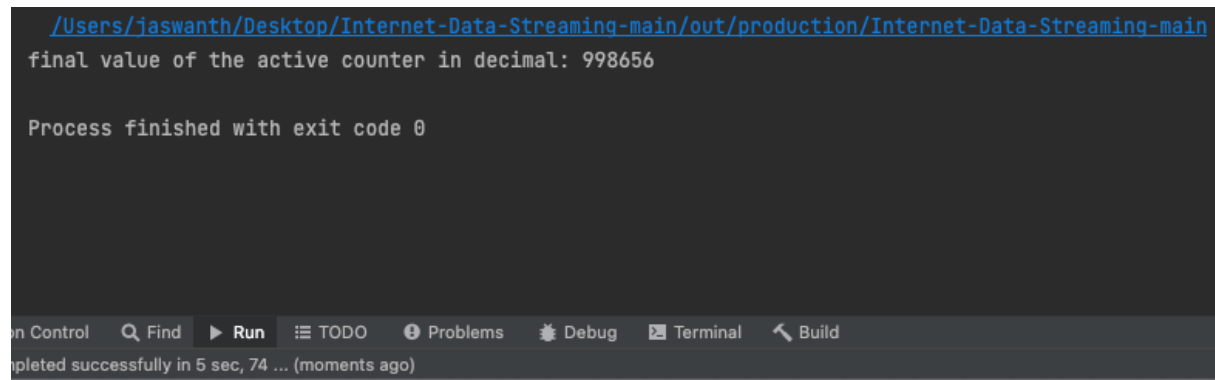
1. CountMin:

```
/Users/jaswanth/Desktop/Internet-Data-Streaming-main/out/production/Internet-Data-Streaming-main
Average error for the flows: 124.2776
Flow          Est      Actual
-----
66.249.64.14   13252    7701
104.154.198.228 10179    9835
159.178.108.111 10013    9848
104.17.183.118  9956     9956
187.237.14.200  9818     9747
159.178.237.53  9681     9681
70.187.95.95    9584     9510
52.84.76.175    9462     9450
103.26.37.253   9326     9324
165.215.209.15  8986     8982
88.231.33.95    8971     8968
73.224.42.241   8917     8910
159.178.107.44  8791     8698
23.202.88.31    8770     8462
216.52.195.182  8754     8584
on Control  Q Find  ▶ Run  ⚙️ TODO  ⓘ Problems  🐛 Debug  📄 Terminal  ⏪ Build
Completed successfully in 3 sec, 855 ... (a minute ago)
```

2. CounterSketch:

```
/Users/jaswanth/Desktop/Internet-Data-Streaming-main/out/production/Internet-Data-Streaming-main
Average error for the flows: 241.1708
Flow          Est      Actual
-----
70.187.95.95    10109    9510
104.17.183.118  9968     9956
187.237.14.200  9734     9747
159.178.237.53  9681     9681
103.26.37.253   9341     9324
159.178.108.111 9315     9848
52.84.76.175    9231     9450
104.154.198.228 9126     9835
73.224.42.241   8886     8910
54.230.161.109  8722     8673
88.231.33.95    8698     8968
159.178.107.44  8656     8698
216.52.195.182  8584     8584
159.178.102.100 8485     8733
23.202.88.31    8471     8462
on Control  Q Find  ▶ Run  ⚙️ TODO  ⓘ Problems  🐛 Debug  📄 Terminal  ⏪ Build
Completed successfully in 2 sec, 160 ... (moments ago)
```

3. ActiveCounter:



```
/Users/jaswanth/Desktop/Internet-Data-Streaming-main/out/production/Internet-Data-Streaming-main  
final value of the active counter in decimal: 998656  
  
Process finished with exit code 0
```

on Control Find Run TODO Problems Debug Terminal Build

pleted successfully in 5 sec, 74 ... (moments ago)