CIS6930 Network Data Streaming

Project 3 Individual Project

Implementation of Flow-Size Sketches

1. Description

In this project, you will implement CountMin, Counter Sketch, and Active Counter.

CountMin

Input: a given file, project3input.txt, where the first line is the number n of flows, which is followed by n lines, each for a flow, containing its flow id (source address) and the number of packets in the flow --- for demo, n = 10,000, k = 3, w = 3000

Function: record the sizes of all flows in CountMin (it does not matter in which order the packets are recorded), query for the estimated sizes of all flows from CountMin, and compute the average error of all flows (for each flow, its error is the absolute value of the difference between the estimated flow size and the true flow size)

Output: (1) the first line of the output: the average error among all flows

(2) the next 100 lines: the flows of the largest estimated sizes, each for a line, including the flow id, its estimated size and its true size

Counter Sketch

Input: a given file, project3input.txt, where the first line is the number n of flows, which is followed by n lines, each for a flow, containing its flow id (source address) and the number of packets in the flow --- for demo, n = 10,000, k = 3, w = 3000

Function: record the sizes of all flows in Counter Sketch (it does not matter in which order the packets are recorded), query for the estimated sizes of all flows from Counter Sketch, and compute the average error of all flows (for each flow, its error is the absolute value of the difference between the estimated flow size and the true flow size)

Output: (1) the first line of the output: the average error among all flows,

(2) the next 100 lines: the flows of the largest estimated sizes, each for a line, including the flow id, its estimated size and its true size

Active Counter

Input: We only use one active counter of 32 bits --- for demo, the number part of the counter is 16 bits, and the exponent part of the counter is also 16 bits.

Function: increase the active counter by one for 1,000,000 times (remember that an active counter does probabilistic increase)
Output: the final value of the active counter in decimal

2. Dates

Handout: 9/26/2020
Due in Canvas: 10/26/2020

3. Programming Environment

Programming language: Java, C, C++, C#, Python
Operating System: Windows, Mac OS or Linux
Programming Tool: Eclipse, IntelliJ, Jcreator, Kawa, Netbeans, … whatever you like.

To use Eclipse, please go through the following list:

1. Download JDK from: https://www.oracle.com/technetwork/java/javase/downloads/jdk8-downloads-2133151.html

2. Download Eclipse from: http://www.eclipse.org/downloads/

3. Here is a link for eclipse tutorial:
http://eclipsetutorial.sourceforge.net/totalbeginner.html

4. Here is a tutorial for socket programming in Java:
http://java.sun.com/docs/books/tutorial/networking/sockets/

4. Code Submission

You must submit the source code and one output file for each sketch with the demo input parameters given earlier. Name the output file after the sketch performed.

Include readme.txt to explain your files.

Submit the project through Canvas:

1) Go to https://elearning.ufl.edu/

2) Click “Login to e-Learning”
3) Login with your gator link username/password
4) Go in CIS6930 Network Data Streaming
5) Click “Assignments” and submit your project

This is an **individual** project. We will run an automatic tool to catch submissions with identical or similar code. There will be no late submissions.