Name: Trevor Buck
ID: 109081318

CSCI 3104, Algorithms
Explain-It-Back 2

Profs. Grochow & Layer
Spring 2019, CU-Boulder

At a recent seminar, you learn that your colleagues in the astronomy department have gained access to new radio telescopes that will drastically increase the amount of data they can collect. In this seminar, these scientists are excited about how this data will significantly improve their predictive models. You politely ask a question about their ability to process all of this new data, and they assure you that they have made all of the necessary hardware improvements to accommodate this new technology.

In a short email, help your colleagues understand that faster processors and more hard drives cannot make up for inefficient algorithms and data structures. Try and convince them of the value of asymptotic analysis, and how based on the result of that analysis they may need to also improve their algorithms and data structures.

Dear colleagues,

I'm very excited to hear about your new telescopes! However, I'm a little worried about your ability to process all of the new information. There's a common misconception that data processing grows at a constant rate (i.e if it takes 10 seconds to process 20 bytes of information, then it would take 20 seconds to process 40 bytes of information)

* Continue on Next Page

Name: Trevor Buck
ID: 109081318

CSCI 3104, Algorithms
Explain-It-Back 2

Profs. Grochow & Layer
Spring 2019, CU-Boulder

However, thats not always the case. Certain programs and processors handle an increase of information differently. Continuing the last example, a bad algorithm could take 100 more seconds to process the new information. Luckily, there are ways to predict how programs will handle the increase in information. I would love to sit down with you and look at your code. Maybe we could analyze it and find a few optimizations.

-Your friend, Trevor Buck