Author Mystery

Ali Malik
malikali@stanford.edu
Game Plan

- Recap
- Algorithm Description
- Code!
Recap
Algorithms

The STL contains pre written algorithms that operate on iterators.

Doing so lets them work on many types of containers.

Uses determined by types of iterators.

Rely heavily on templates.
Sometimes we need to form “weird” iterators:

- Iterating over **streams** would be pretty cool
- Having an iterator that could “**insert**” into a collection would be pretty cool

This is where iterator adaptors come in.
Here’s a cool application of this. This code prints the vector:

```cpp
std::vector<int> v{3, 1, 4, 1, 5};
std::copy(v.begin(), v.end(),
          std::ostream_iterator<int>(cout, "", "\n"))
```
Now we can solve the coyote problem:

```cpp
vector<int> v {561, 1105, 1729, 2465};
vector<int> vCopy;

std::copy(v.begin(), v.end(),
            std::back_inserter(vCopy));
```
Today
THE FEDERALIST:
A COLLECTION OF ESSAYS,
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AS AGREED UPON BY THE FEDERAL CONVENTION,
SEPTEMBER 17, 1787.

IN TWO VOLUMES.
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This work will be printed on a fine paper and good type, in one handsome volume dedicated, and delivered to subscribers at the moderate price of one dollar. A few copies will be printed on superfine royal writing paper, price ten shillings.
No money required till delivery.
To render this work more complete, will be added, without any additional expenses,
PHILO-PUBLIUS,
AND THE
Articles of the Convention,
As agreed upon at Philadelphia, September 17th, 1787.

The FŒDERALIST, No. 10.
To the People of the State of New-York.

A mong the numerous advantages promised by a well-constructed Union, none deserves to be more accurately developed than its tendency to break and control the violence of faction. The friend of popular governments, never finds himself so much alarmed for their character and fate, as when he contemplates their propensity to this dangerous vice. He will not fail therefore to set a due value on any plan which, without violating the principles to which he is attached, provides a proper cure for it. The infallibility, injustice and confusion introduced into the public councils, have in truth been the mortal diseases under which popular governments have everywhere perished; as they continue to be the favorite and fruitful topics from which the adversaries to liberty derive their most specious declamations. The valuable improvements made by the American Constitutions on the popular models, both ancient and modern, cannot be

The influence of fœderal leaders may kindle a flame within their particular States, but will be unable to spread a general conflagration through the other States. A religious sect, may degenerate into a political faction in a part of the country; but the variety of fields dispersed over the entire face of it, must secure the national Councils against any danger from that source: A rage for paper money, for an abolition of debts, for an equal division of property, or for any other improper or wicked projects, will be less apt to pervade the whole body of the Union, than a particular member of it; in the same proportion as such a malady is more likely to taint a particular county or district, than an entire State.

In the extent and proper structure of the Union, therefore, we behold a republican remedy for the diseases most incident to republican Government. And according to the degree of pleasure and prosperity we feel in being Republicans, ought to be our zeal in cherishing the spirit and supporting the character of Federalists.
Can we discover an author’s identity from their writing?
The Idea

Authors have an underlying writing style.

Subconsciously writers tend to write in a consistent manner.

...  

Could we use these tendencies as a literary fingerprint?
The Idea

We need a writer invariant.

Function words:

- Syntactic glue of a language
- E.g. the, I, he, she, do, from, because...
The Idea

Let’s imagine our language only has 3 function words:

[I, the, there]

Deep into that darkness peering, long I stood there, wondering, fearing, doubting, dreaming dreams no mortal ever dared to dream before.

- Edgar Allan Poe

I first met Dean not long after my wife and I split up. I had just gotten over a serious illness that I won’t bother to talk about, except that it had something to do with the miserably weary split-up and my feeling that everything there was dead.

- Jack Kerouac
The Idea

We can create a fingerprint vector for the two texts.

[I, the, there]

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The Idea

\[
\begin{bmatrix}
1 & 0 & 0 \\
4 & 1 & 1
\end{bmatrix}
\]
The Idea

\[
\begin{bmatrix}
1 & 0 & 0 \\
\end{bmatrix}
\quad
\begin{bmatrix}
4 & 1 & 1 \\
\end{bmatrix}
\]
The Idea

\[
\begin{bmatrix}
1, & 0, & 0 \\
\end{bmatrix} \quad \begin{bmatrix}
4, & 1, & 1 \\
\end{bmatrix}
\]
The Idea

\[
\begin{bmatrix}
1, 0, 0
\end{bmatrix}
\quad
\begin{bmatrix}
4, 1, 1
\end{bmatrix}
\]

The closer this angle, the more similar the texts.
The Idea

\[ \cos \theta = \frac{\vec{u} \cdot \vec{v}}{||\vec{u}|| ||\vec{v}||} \]
Let’s start coding!
The code for getting the word count will be really useful for the first part of assignment 2.