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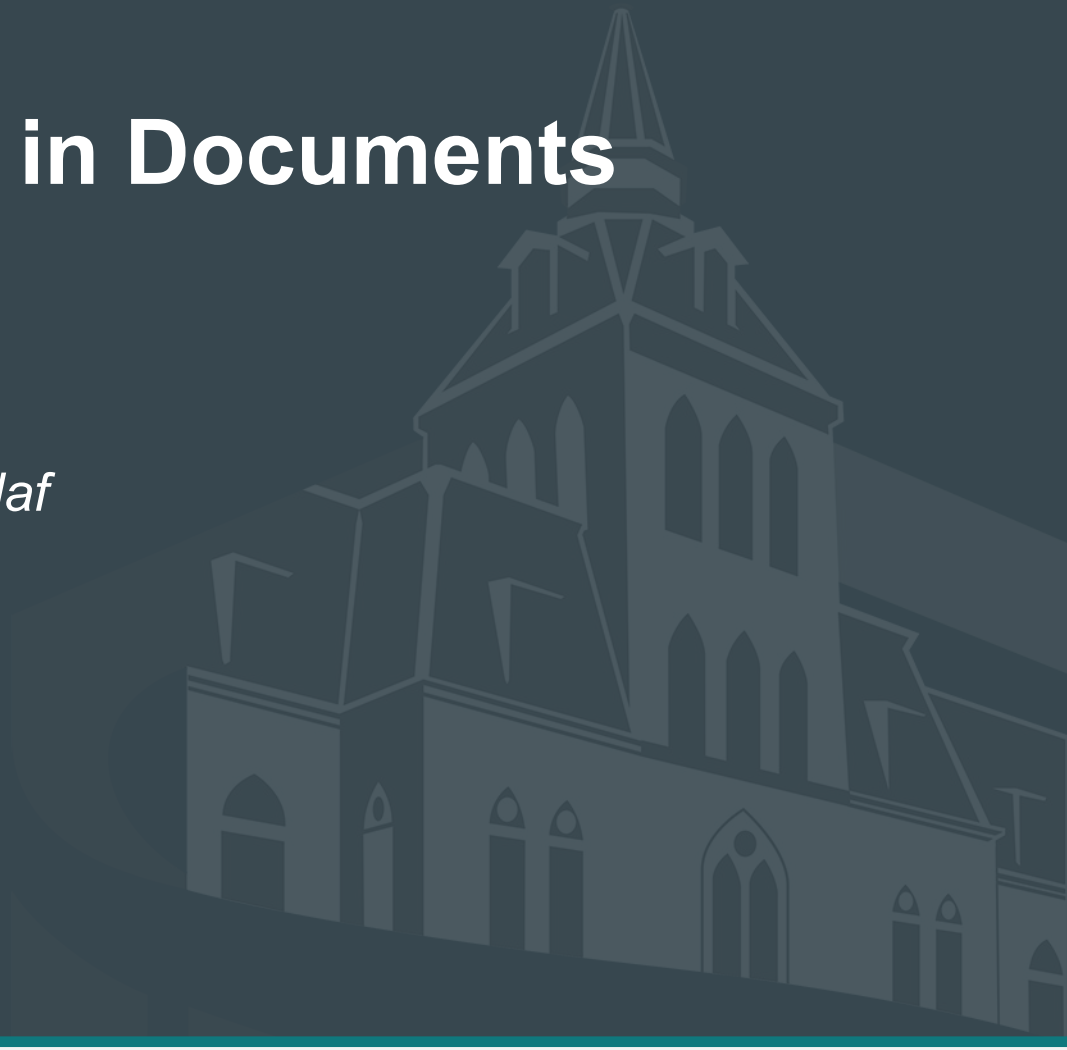
Factoring Common Text in Documents

Trevor Dawideit

Gousemoodhin Nadaf



I pledge my honor that I have abided by the Stevens Honor System.

Agenda

- Introduction
- Problem
- Solution
- Results
- Demo
- Improvements
- Q&A

Introduction

Problem

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Title: Moby-Dick; or The Whale

Author: Herman Melville

Release Date: June, 2001 [eBook #2701]
[Most recently updated: December 3, 2017]

Language: English

Character set encoding: UTF-8

Produced by: Daniel Lazarus, Jonesey, and David Widger

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Title: A Study In Scarlet

Author: Arthur Conan Doyle

Release Date: July 12, 2008 [EBook #244]
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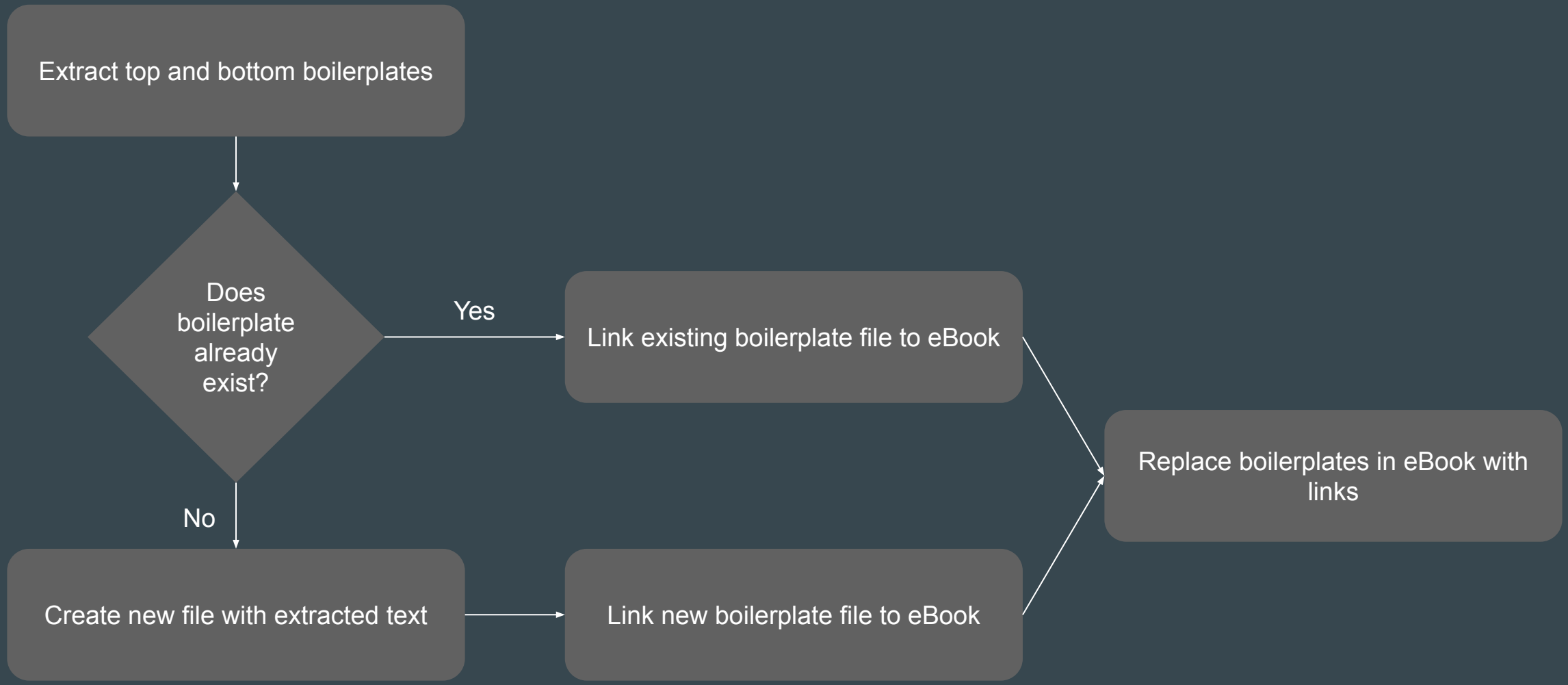
Solution


Extract top and bottom boilerplates
Does boilerplate already exist?
Yes
No
Link existing boilerplate file to eBook
Create new file with extracted text
Link new boilerplate file to eBook
Replace boilerplates in eBook with links

Solution (Extract top and bottom boilerplates)

Create 4 vectors:

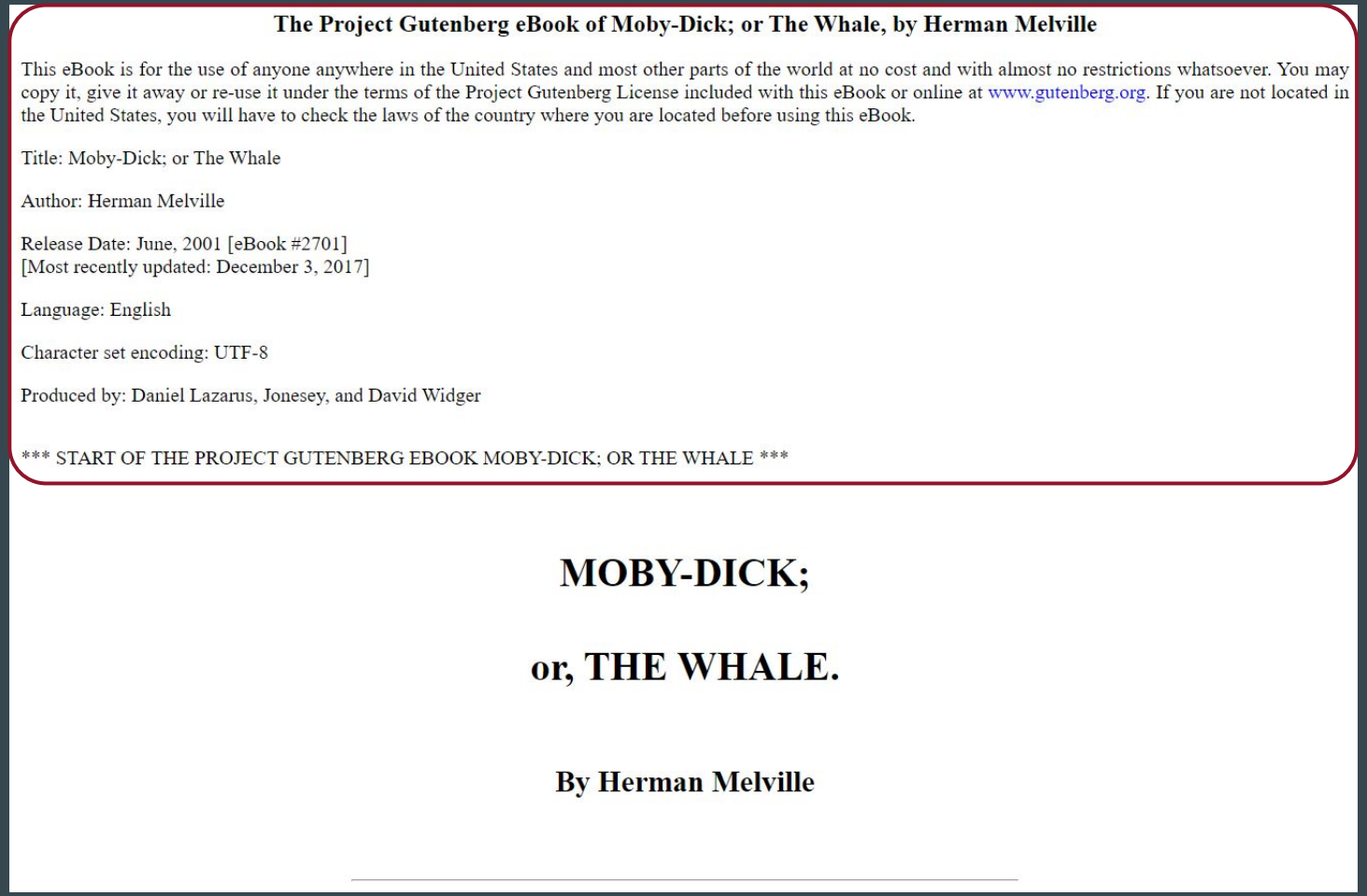
topFileContent

topBoilerplate

mainFileContent

bottomBoilerplate

Solution (Extract Top Boilerplate)



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Language: English

Character set encoding: UTF-8

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Solution (Extract Top Boilerplate cont.)

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<div style="display:block; margin-top:1em; margin-bottom:1em; margin-left:2em; text-indent:-2em">Author: Herman Melville</div>
<div style="display:block;margin:1em 0">Release Date: June, 2001 [eBook #2701]<br>
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Solution (Extract Top Boilerplate cont.)

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Solution (Extract Bottom Boilerplate)

The drama's done. Why then here does any one step forth?—Because one did survive the wreck.

It so chanced, that after the Parsee's disappearance, I was he whom the Fates ordained to take the place of Ahab's bowsman, when that bowsman assumed the vacant post; the same, who, when on the last day the three men were tossed from out of the rocking boat, was dropped astern. So, floating on the margin of the ensuing scene, and in full sight of it, when the halfspent suction of the sunk ship reached me, I was then, but slowly, drawn towards the closing vortex. When I reached it, it had subsided to a creamy pool. Round and round, then, and ever contracting towards the button-like black bubble at the axis of that slowly wheeling circle, like another Ixion I did revolve. Till, gaining that vital centre, the black bubble upward burst; and now, liberated by reason of its cunning spring, and, owing to its great buoyancy, rising with great force, the coffin life-buoy shot lengthwise from the sea, fell over, and floated by my side. Buoyed up by that coffin, for almost one whole day and night, I floated on a soft and dirgelike main. The unharming sharks, they glided by as if with padlocks on their mouths; the savage sea-hawks sailed with sheathed beaks. On the second day, a sail drew near, nearer, and picked me up at last. It was the devious-cruising Rachel, that in her retracing search after her missing children, only found another orphan.

Solution (Extract Bottom Boilerplate cont.)

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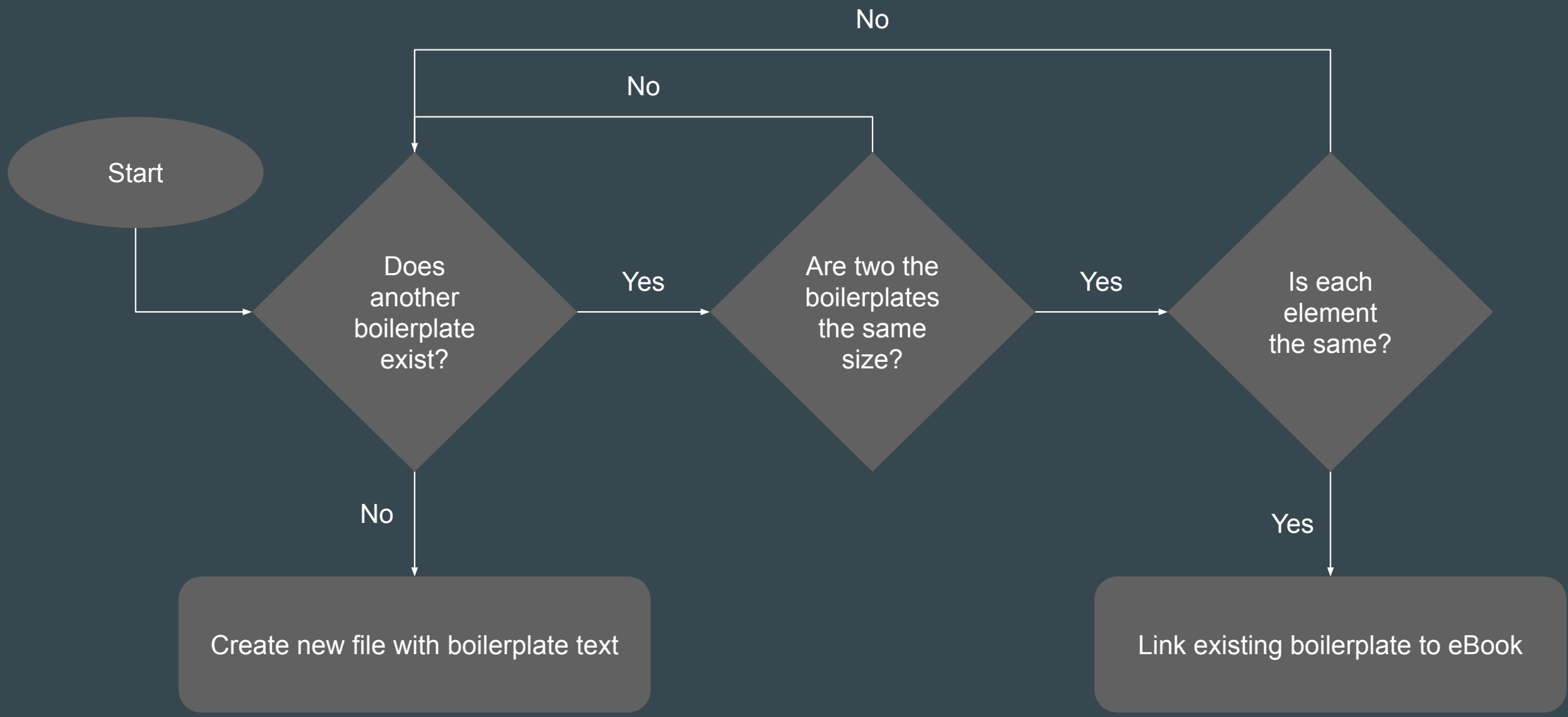
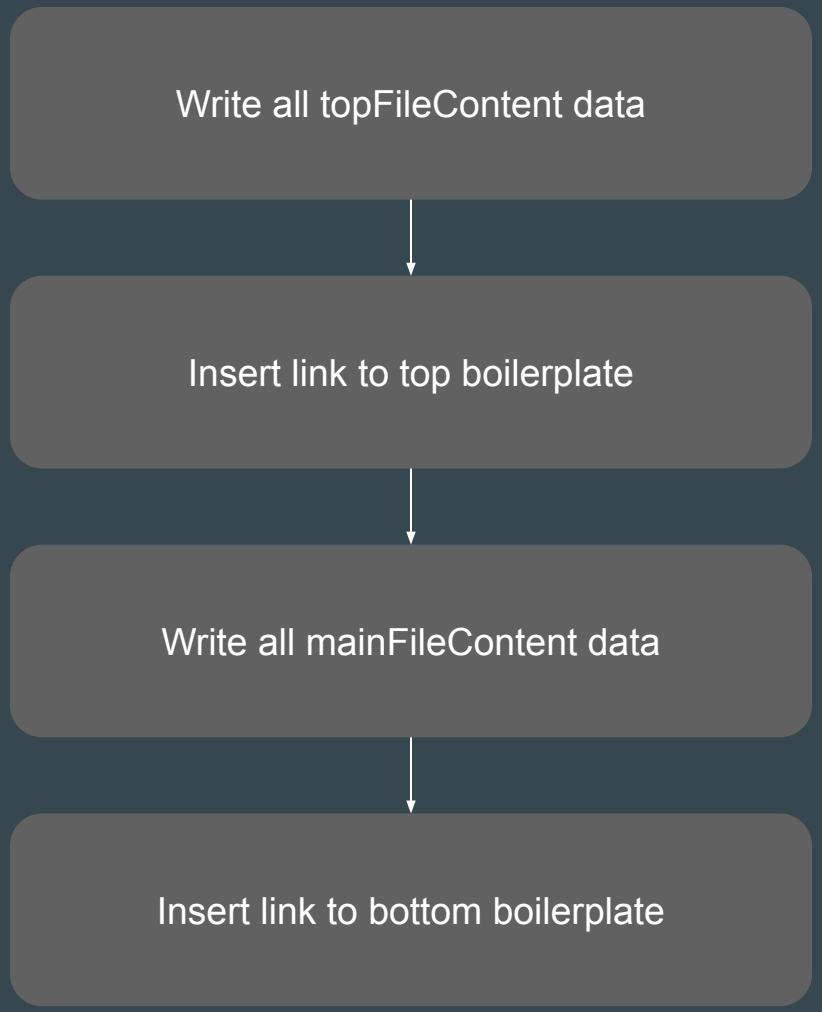
Solution (Check if boilerplate already exists)



Solution (Replace text with link)

Create new file:



Results (Complexity)

- Outer loop = O(F), F = Number of files
- Inner loop = O(M), M = Number of lines in file
- Boilerplate comparison = O(K), K = Length of boilerplate * Number of existing boilerplates
  - This comparison is run for both top and bottom boilerplates.
- Output file creation = O(L), L = Length of topFileContent + length of mainFileContent

Total Complexity:

O(F * (M + K + L))

O(n), n = total number of lines in all files

Live Demo

Improvements

Boilerplate Detection

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Improvements

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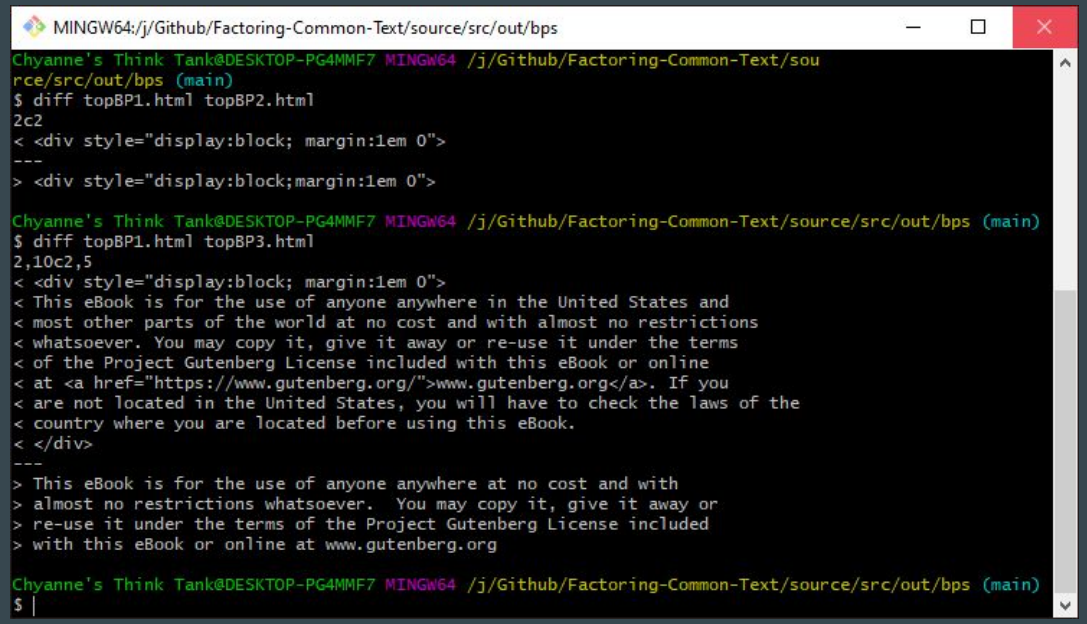

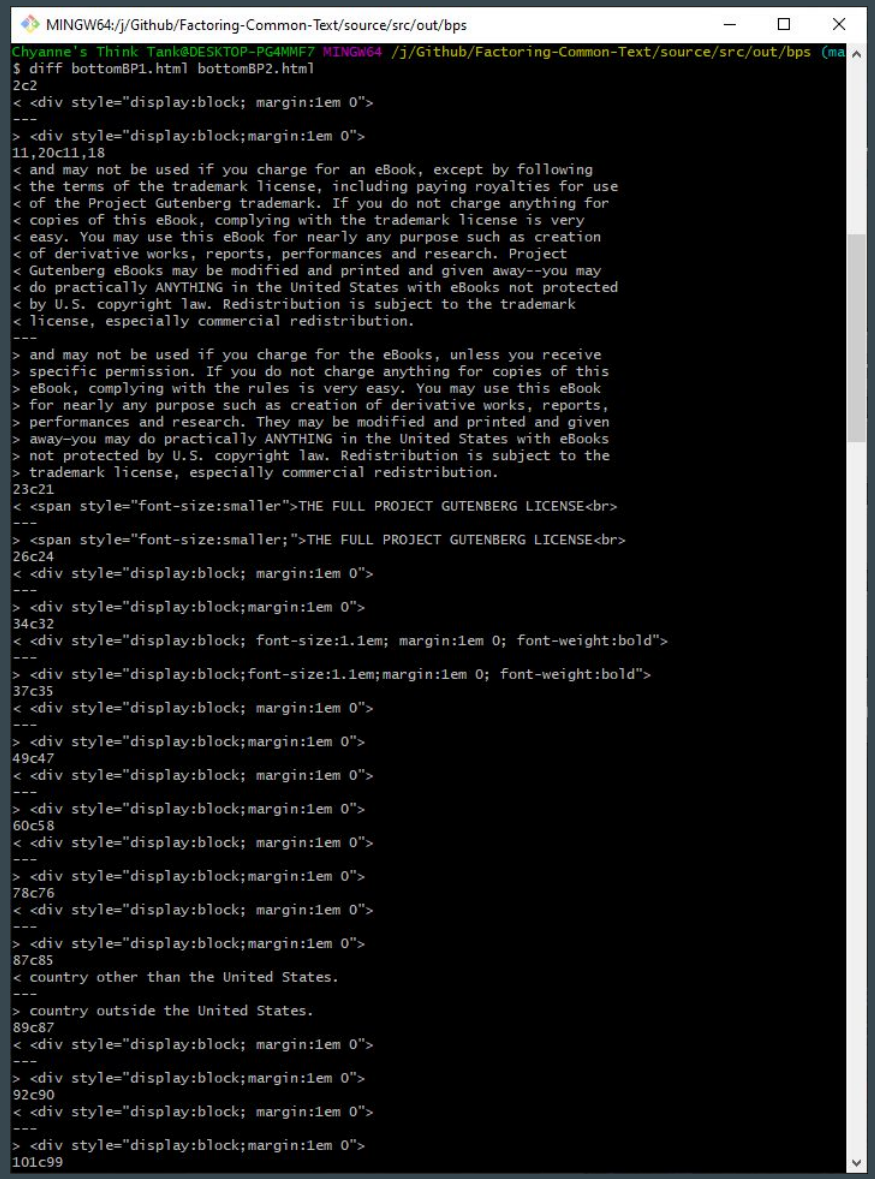

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