

# CPSC 223C: The C Programming Language – Spring 2020

## Final Project Two, **diff**, due Sunday, 10 May 2020

Teams of developers must have tools that can compare changes made to code by others to the code base. Tools like **diff** and **patch** are used by code review teams, and by version control systems, to make code reviews comprehensive, to the point, and to save memory on servers.

We (you) are going to build a slightly-simplified version of diff, that doesn't work on more than 2 files at a time, nor does it work on directories (although that wouldn't be difficult to add to it). Also, your version of diff doesn't have to do all of the options of standard diff.

It does have to provide the basic elements of diff, though, as listed in the form at the end of this document, including comparing files, printing out lines that are different in a variety of formats (combined, unified, side-by-side, as well as

For those unfamiliar with diff, check out the manual pages for them (`man diff`).

### Submission

Turn in the code for this project by uploading all of the source files you created to a single public repository on GitHub. While you may discuss this assignment with other students, work you submit must have been completed on your own. To complete your submission, print the sheet at the back of this file, fill out its spaces, and submit it to the instructor in class by the deadline. Failure to follow the instructions exactly will incur a 10% penalty on the grade for this assignment.

The basic form of using diff is as follows: `diff (options) file1 file2` Examples of each of the functionalities your version of diff should provide are given below.

left.txt (file1)	right.txt (file2)
<p>This part of the document has stayed the same from version to version. It shouldn't be shown if it doesn't change. Otherwise, that would not be helping to compress the size of the changes.</p> <p>This paragraph contains text that is outdated. It will be deleted in the near future.</p> <p>It is important to spell <b>check this dokument. On</b> the other hand, a misspelled word isn't the end of the world. Nothing in the rest of this paragraph needs to be changed. Things can be added after it.</p>	<p>This is an important notice! It should therefore be located at the beginning of this document!</p> <p>This part of the document has stayed the same from version to version. It shouldn't be shown if it doesn't change. Otherwise, that would not be helping to compress the size of the changes.</p> <p>It is important to spell <b>check this document. On</b> the other hand, a misspelled word isn't the end of the world. Nothing in the rest of this paragraph needs to be changed. Things can be added after it.</p> <p>This paragraph contains important new additions to this document.</p>

```
diff -q left.txt right.txt // BRIEF MODE
Files left.txt and right.txt differ
```

```
diff -s left.txt left.txt // FILES IDENTICAL MODE
```

Files left.txt and left.txt are identical

diff left.txt right.txt	diff right.txt left.txt
<pre>0a1,6 &gt; This is an important &gt; notice! It should &gt; therefore be located at &gt; the beginning of this &gt; document! &gt; 11,15d16 &lt; This paragraph contains &lt; text that is outdated. &lt; It will be deleted in the &lt; near future. &lt; 17c18 &lt; check this dokument. On --- &gt; check this document. On 24a26,29 &gt; &gt; This paragraph contains &gt; important new additions &gt; to this document.</pre>	<pre>1,6d0 &lt; This is an important &lt; notice! It should &lt; therefore be located at &lt; the beginning of this &lt; document! &lt; 16a11,15 &gt; This paragraph contains &gt; text that is outdated. &gt; It will be deleted in the &gt; near future. &gt; 18c17 &lt; check this document. On --- &gt; check this dokument. On 26,29d24 &lt; &lt; This paragraph contains &lt; important new additions &lt; to this document.</pre>

```
diff -y left.txt right.txt // SIDE by SIDE MODE
```

<pre>This part of the document has stayed the same from version to version. It shouldn't be shown if it doesn't change. Otherwise, that would not be helping to compress the size of the changes.  This paragraph contains text that is outdated. It will be deleted in the near future.  It is important to spell check this dokument. On the other hand, a misspelled word isn't the end of the world. Nothing in the rest of this paragraph needs to be changed. Things can be added after it.</pre>	<pre>&gt; This is an important &gt; notice! It should &gt; therefore be located at &gt; the beginning of this &gt; document! &gt; This part of the document has stayed the same from version to version. It shouldn't be shown if it doesn't change. Otherwise that would not be helping to compress the size of the changes.  &lt; &lt; &lt; &lt;  It is important to spell   check this document. On the other hand, a misspelled word isn't the end of the world. Nothing in the rest of this paragraph needs to be changed. Things can be added after it. &gt;</pre>
---	--

	<pre>&gt; This paragraph contains &gt; important new additions &gt; to this document.</pre>
--	---

diff -y --left-column left.txt right.txt // SIDE by SIDE MODE	
<pre>This part of the document has stayed the same from version to version. It shouldn't be shown if it doesn't change. Otherwise, that would not be helping to compress the size of the changes.  This paragraph contains text that is outdated. It will be deleted in the near future.  It is important to spell check this dokument. On the other hand, a misspelled word isn't the end of the world. Nothing in the rest of this paragraph needs to be changed. Things can be added after it.</pre>	<pre>&gt; This is an important &gt; notice! It should &gt; therefore be located at &gt; the beginning of this &gt; document! &gt; ( ( ( ( ( ( ( ( ( &lt; &lt; &lt; &lt; (   check this document. On ( ( ( ( ( ( ( &gt; &gt; This paragraph contains &gt; important new additions &gt; to this document.</pre>

diff -y --suppress-common-lines left.txt right.txt // SUPPRESS COMMON LINES	
<pre>This paragraph contains text that is outdated. It will be deleted in the near future.  check this dokument. On</pre>	<pre>&gt; This is an important &gt; notice! It should &gt; therefore be located at &gt; the beginning of this &gt; document! &gt; &lt; &lt; &lt; &lt; &lt;   check this document. On &gt; &gt; This paragraph contains &gt; important new additions &gt; to this document.</pre>

## CPSC 223C Project 2 – **diff**, due Saturday 16 May 2020 at 23:59

Your name and company name: **Jared Dyreson, California State University Fullerton**

Portfolio: <http://jareddyreson.com>

Verify each of the following items with a corresponding checkmark. Incorrect items will incur a 5% penalty on the grade.

Complete	Incomplete	<b>diff</b>
<input type="checkbox"/>	<input type="checkbox"/>	Researched <b>diff</b> on the Unix man page and on wikipedia
<input type="checkbox"/>	<input type="checkbox"/>	<b>diff -v</b> aka <b>--version</b> (prints version, license, and author (you))
<input type="checkbox"/>	<input type="checkbox"/>	<b>diff -q</b> aka <b>--brief</b> (reports only whether files are different; silent if they are not)
<input type="checkbox"/>	<input type="checkbox"/>	<b>diff -s</b> aka <b>--report-identical-files</b> (reports if files are the same; usual out if they are not)
<input type="checkbox"/>	<input type="checkbox"/>	<b>diff -s -q</b> reports identical with identical files, and different with different files (i.e., it never shows usual output of lines that are different)
<input type="checkbox"/>	<input type="checkbox"/>	<b>diff file1 file2</b> aka <b>--normal</b> (default behavior)
<input type="checkbox"/>	<input type="checkbox"/>	<b>diff -y</b> aka <b>--side-by-side</b> prints common paras unless <b>--suppress-common-lines</b> is set It shows a '<' / '>' for left/right-hand side, nothing for common paragraphs, except a ' ' for any lines that are different in the common paragraphs.
<input type="checkbox"/>	<input type="checkbox"/>	<b>diff -y --left-column</b> (... , prints only the left column of common lines), with '(' to remind that there is a common right-hand paragraph). (' ' is shown for differing lines)
<input type="checkbox"/>	<input type="checkbox"/>	<b>diff -y --suppress-common-lines</b> ... (side-by-side but doesn't show common lines) lines in a common paragraph that differ are shown, along with a ' '
<input type="checkbox"/>	<input type="checkbox"/>	<b>diff -c NUM</b> aka <b>--context=NUM</b> , (default 3 lines of copied context) *** l 2020-03-31 22:51:24.000000000 -0700 (files are l and r) --- r 2020-03-31 22:51:40.000000000 -0700 ***** *** 1,3 **** (lines of context, *** for left file, --- for right file) --- 1,9 ---- + This is an important (+ means add, - means delete,   means different) + notice! It should + therefore be located at + the beginning of this + document! +
<input type="checkbox"/>	<input type="checkbox"/>	<b>diff -u NUM</b> aka <b>--unified=NUM</b> (shows NUM default 3 lines of unified context) --- /path/to/original timestamp +++ /path/to/new timestamp @@ -1,3 +1,9 @@ +This is an important +notice! It should +therefore be located at +the beginning of this +document
<input type="checkbox"/>	<input type="checkbox"/>	Used a header file to prototype all functions in diff.h
<input type="checkbox"/>	<input type="checkbox"/>	Project directory pushed to new GitHub repository listed above using GitHub client.

### Your comments

To compile, run “make” and it will compile the binary called “delta”.  
 Printing side by side does not work as intended and I spent over a month debugging with no success. I also got really odd segmentation faults and all the memory passed in was valid so I have no idea.