

## **Homework 3 – Implementation of an advanced maintenance task in an unfamiliar Open Source Software (jEdit)**

**Software system and version:** jEdit 5.4.0

### **Change Request:**

Add a new feature to jEdit which allows lines to be drawn beneath the text to simulate the look of a paper notepad. Also, there should be an option to allow the user to disable/enable this feature. The location of this control should be under “Utilities->Global Options...->jEdit->Text Area”.

### **Detailed Development Environment Description:**

Command Line, git

### **Compilation/Building and Running Issues Description:**

At first, I downloaded both of apache and jedit in the same folder. I put them in different each folder. When I compile ‘ant run’, it said that ‘No such file or directory’ even though I downloaded both of apache and jedit zip file. I went to system properties in control panel to edited the system environment variables and it worked well! However, I had some problem about git. In C:\Users\ahram, there was a big parent .git. So, I delete the parent git folder and git also worked very well.

When I tried to import jEdit in Eclipse, I had some problems and errors. I went to the Build Path of jEdit project, and Configure Build Path. In Libraries of Java Build Path, I added JARs called ‘jsr305-1.3.9.jar’ for jEdit. I passed some of errors. However, there are still errors. That is because they are unreadable word from Java. So I just made them comment. And, it was installed successfully.

```
.gitignore  DisplayTokenHandler.java  TextUtilities.java
86  * @since jEdit 4.3pre2
87  */
88  public static char getComplementaryBracket(char ch, boolean[] direction)
89  {
90      switch(ch)
91      {
92          case '(': if (direction != null) direction[0] = true; return ')';
93          case ')': if (direction != null) direction[0] = false; return '(';
94          case '[': if (direction != null) direction[0] = true; return ']';
95          case ']': if (direction != null) direction[0] = false; return '[';
96          case '{': if (direction != null) direction[0] = true; return '}';
97          case '}': if (direction != null) direction[0] = false; return '{';
98          case '<': if (direction != null) direction[0] = true; return '>';
99          // case '>': if (direction != null) direction[0] = false; return '<';
100         // case ';': if (direction != null) direction[0] = true; return ';';
101         // case 'Â': if (direction != null) direction[0] = false; return 'Â';
102         // case 'â€¹': if (direction != null) direction[0] = true; return 'â€¹';
103         // case 'â€²': if (direction != null) direction[0] = false; return 'â€²';
104         // case 'â€™': if (direction != null) direction[0] = true; return 'â€™';
105         // case 'â€™': if (direction != null) direction[0] = false; return 'â€™';
106         // case 'â€¦': if (direction != null) direction[0] = true; return 'â€¦';
107         // case 'â€¦': if (direction != null) direction[0] = false; return 'â€¦';
108         // case 'â€«': if (direction != null) direction[0] = true; return 'â€«';
109         // case 'â€«': if (direction != null) direction[0] = false; return 'â€«';
110         // case 'â€™': if (direction != null) direction[0] = true; return 'â€™';
111         // case 'â€™': if (direction != null) direction[0] = false; return 'â€™';
112         // case 'â€™': if (direction != null) direction[0] = true; return 'â€™';
113         // case 'â€™': if (direction != null) direction[0] = false; return 'â€™';
114         // case 'â€™': if (direction != null) direction[0] = true; return 'â€™';
115         // case 'â€™': if (direction != null) direction[0] = false; return 'â€™';
116         default: return '\0';
117     }
118 } //}}}
119
120 //{{{ findMatchingBracket() method
```

**Screenshot of successful compilation:**

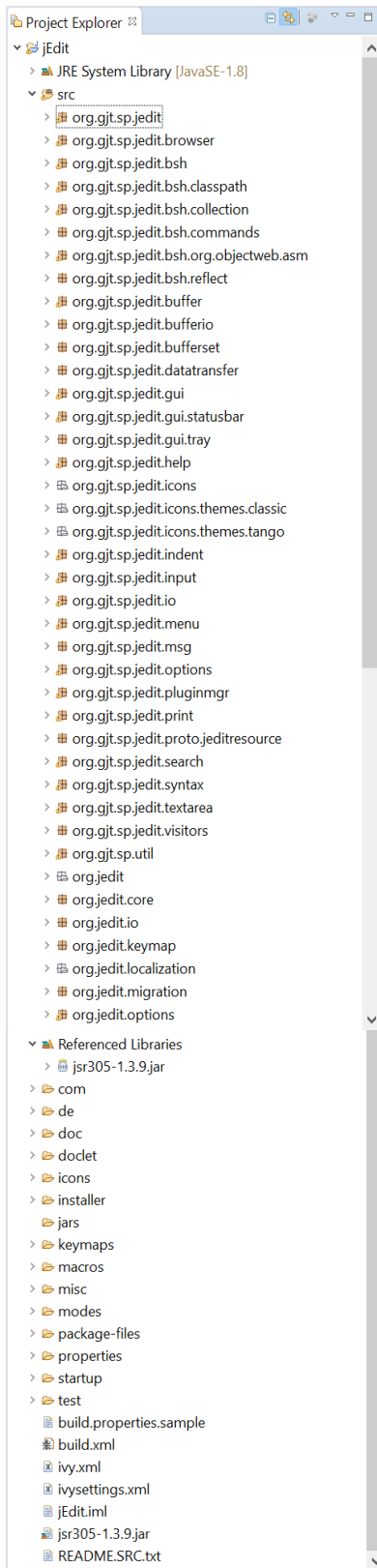


Figure 1 Screenshot of successful compilation of jEdit 5.4 in Eclipse 4.6 in Windows 10.

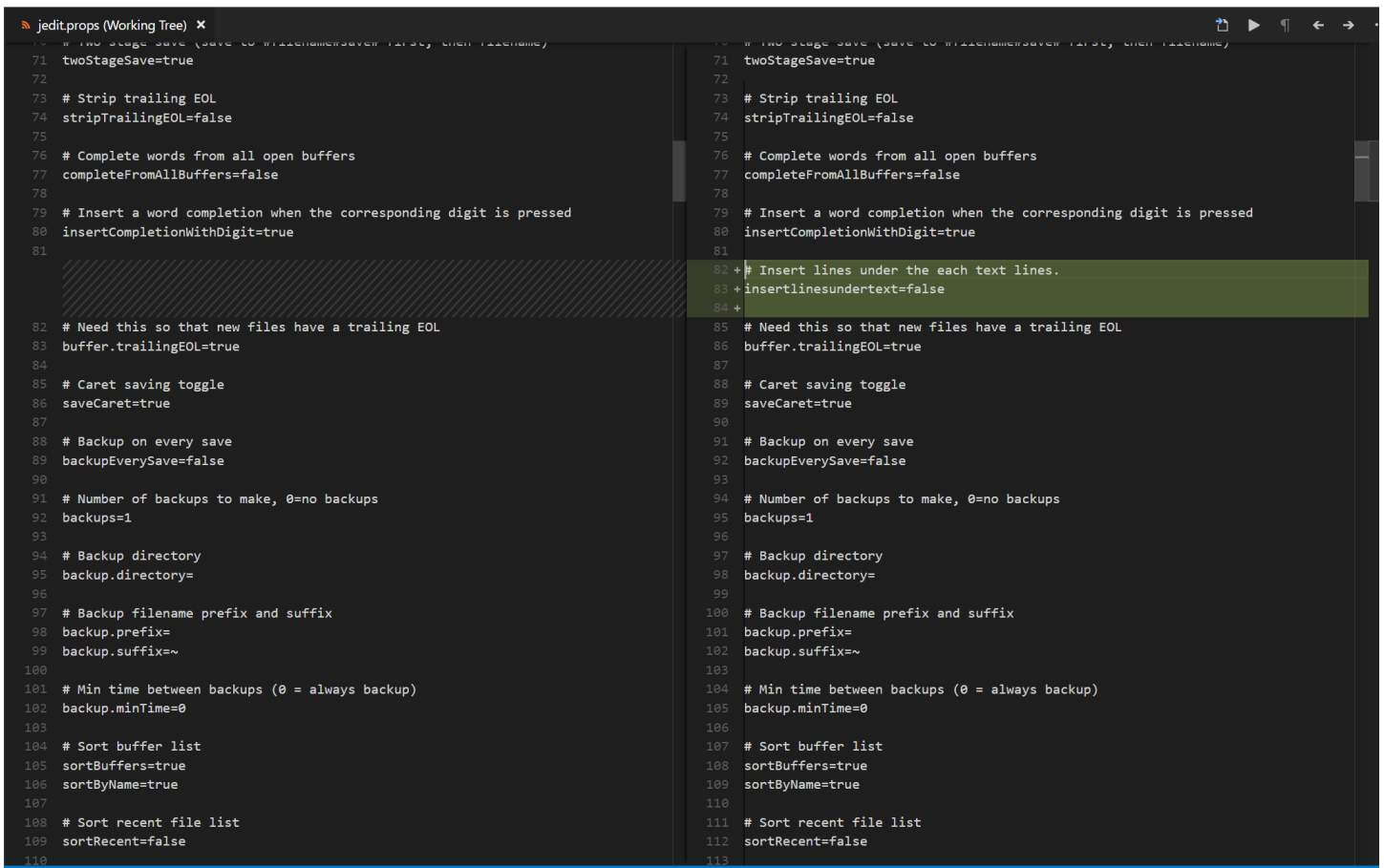
## Identifying the Relevant Code (i.e., Concept Location):

I looked for texts which in jEdit -> Utilities -> Global Option. I tried to search the texts in global option such as “Electric (auto scroll) borders”, “Hide final end of line (if any)”, or “Complete words from all open buffers (default is to limit search to currently visible buffers)”. Then, I got three files ‘jedit\_em.props’, ‘jedit.props’ and ‘BufferIORequest.java’ to modify for HW3. I got nothing matches when I searched them in .java file. I should have searched in all files.

## Successful Implementation Video:

<https://youtu.be/fgJzgMTXOdg>

## Highlighted Source Code of the Implementation in a Side-by-Side readable format:



```
71 twoStageSave=true
72
73 # Strip trailing EOL
74 stripTrailingEOL=false
75
76 # Complete words from all open buffers
77 completeFromAllBuffers=false
78
79 # Insert a word completion when the corresponding digit is pressed
80 insertCompletionWithDigit=true
81
82 # Need this so that new files have a trailing EOL
83 buffer.trailingEOL=true
84
85 # Caret saving toggle
86 saveCaret=true
87
88 # Backup on every save
89 backupEverySave=false
90
91 # Number of backups to make, 0=no backups
92 backups=1
93
94 # Backup directory
95 backup.directory=
96
97 # Backup filename prefix and suffix
98 backup.prefix=
99 backup.suffix=~
100
101 # Min time between backups (0 = always backup)
102 backup.minTime=0
103
104 # Sort buffer list
105 sortBuffers=true
106 sortByName=true
107
108 # Sort recent file list
109 sortRecent=false
110
```

```
71 twoStageSave=true
72
73 # Strip trailing EOL
74 stripTrailingEOL=false
75
76 # Complete words from all open buffers
77 completeFromAllBuffers=false
78
79 # Insert a word completion when the corresponding digit is pressed
80 insertCompletionWithDigit=true
81
82 # Insert lines under the each text lines.
83 insertLinesUnderText=false
84
85 # Need this so that new files have a trailing EOL
86 buffer.trailingEOL=true
87
88 # Caret saving toggle
89 saveCaret=true
90
91 # Backup on every save
92 backupEverySave=false
93
94 # Number of backups to make, 0=no backups
95 backups=1
96
97 # Backup directory
98 backup.directory=
99
100 # Backup filename prefix and suffix
101 backup.prefix=
102 backup.suffix=~
103
104 # Min time between backups (0 = always backup)
105 backup.minTime=0
106
107 # Sort buffer list
108 sortBuffers=true
109 sortByName=true
110
111 # Sort recent file list
112 sortRecent=false
113
```

Figure 1 git diff visualization using Visual Studio Code from jedit.props (<https://code.visualstudio.com/>).

```

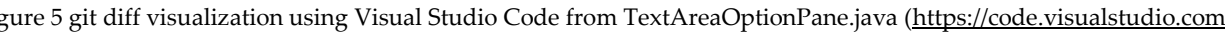
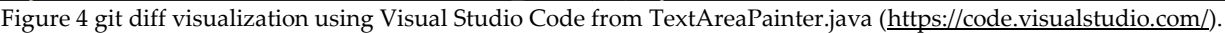
1815 options.textarea.stdNextPrevWord=Go to next/previous word commands eat whitespac
1816 options.textarea.antiAlias=Anti Aliased smooth text
1817 options.textarea.antiAlias.tooltip=Slows down display on some systems
1818 options.textarea.fracFontMetrics=Fractional font metrics
1819 options.textarea.fracFontMetrics.tooltip=Not recommended with subpixel antialias
1820 options.textarea.stripTrailingEOL=Hide final end of line (if any)
1821 options.textarea.completeFromAllBuffers=Complete words from all open buffers (de
1822 to limit search to currently visible buffers)
1823 options.textarea.insertCompletionWithDigit=Complete word by typing corresponding
1824 + options.textarea.insertLinesUnderText=Allow lines under each text lines.
1825 +
1826 +
1827 options.textarea.lineSpacing.label=Extra vertical line spacing (in pixels):
1828 #}}}
1829
1830 #{{{ Tool Bar pane
1831 options.toolbar.label=Tool Bar
1832 options.toolbar.showToolbar=Show tool bar
1833 options.toolbar.caption=Buttons to display on tool bar:
1834 options.toolbar.add=Add...
1835 options.toolbar.edit=Edit...
1836 options.toolbar.remove=Remove
1837 options.toolbar.moveUp=Move Up
1838 options.toolbar.moveDown=Move Down
1839 options.toolbar.reset=Reset to Default
1840 options.toolbar.edit.title=Edit Tool Bar Entry
1841 options.toolbar.edit.caption=Type:
1842 options.toolbar.edit.separator=Separator
1843 options.toolbar.edit.action=Command or macro:
1844 options.toolbar.edit.builtin=Use built-in icon:
1845 options.toolbar.edit.file=Load icon from file:
1846 options.toolbar.edit.choose=Choose
1847 options.toolbar.edit.no-icon=No icon selected
1848
1849 options.toolbar.reset.dialog.title=Reset to Default
1850 options.toolbar.reset.dialog.message=Are you sure you want to reset the toolbar
1851 #}}}
1852
1853 #{{{ View pane
1854 options.view.label=View
1855 options.view.viewLayout=View layout
1856 options.view.floatableToolbars=Floatable Toolbars
1857 options.view.alternateDockingLayout=Alternate docked window placement
  
```

Figure 2 git diff visualization using Visual Studio Code from jedit\_en.props (<https://code.visualstudio.com/>).

```

1007 setAutoscrolls(true);
1008 setOpaque(true);
1009 setRequestFocusEnabled(false);
1010 setDoubleBuffered(false);
1011
1012 setCursor(Cursor.getPredefinedCursor(Cursor.TEXT_CURSOR));
1013
1014 fontRenderContext = new FontRenderContext(null,false,false);
1015
1016 + addExtension(LINE_BACKGROUND_LAYER,new NotePad());
1017 addExtension(LINE_BACKGROUND_LAYER,new PaintLineBackground());
1018 addExtension(SELECTION_LAYER,new PaintSelection());
1019 addExtension(WRAP_GUIDE_LAYER,new PaintWrapGuide());
1020 addExtension(BRACKET_HIGHLIGHT_LAYER,new StructureMatcher
1021 .Highlight(textArea));
1022 addExtension(TEXT_LAYER,new PaintText());
1023 addExtension(TEXT_LAYER,new PaintSelectionText());
1024 caretExtension = new PaintCaret();
1025
1026 extraLineSpacing = 0;
1027 } //}}}
1028 //}}}
1029
1030 //{{{ Private members
  
```

Figure 3 git diff visualization using Visual Studio Code from TextAreaPainter.java (<https://code.visualstudio.com/>).





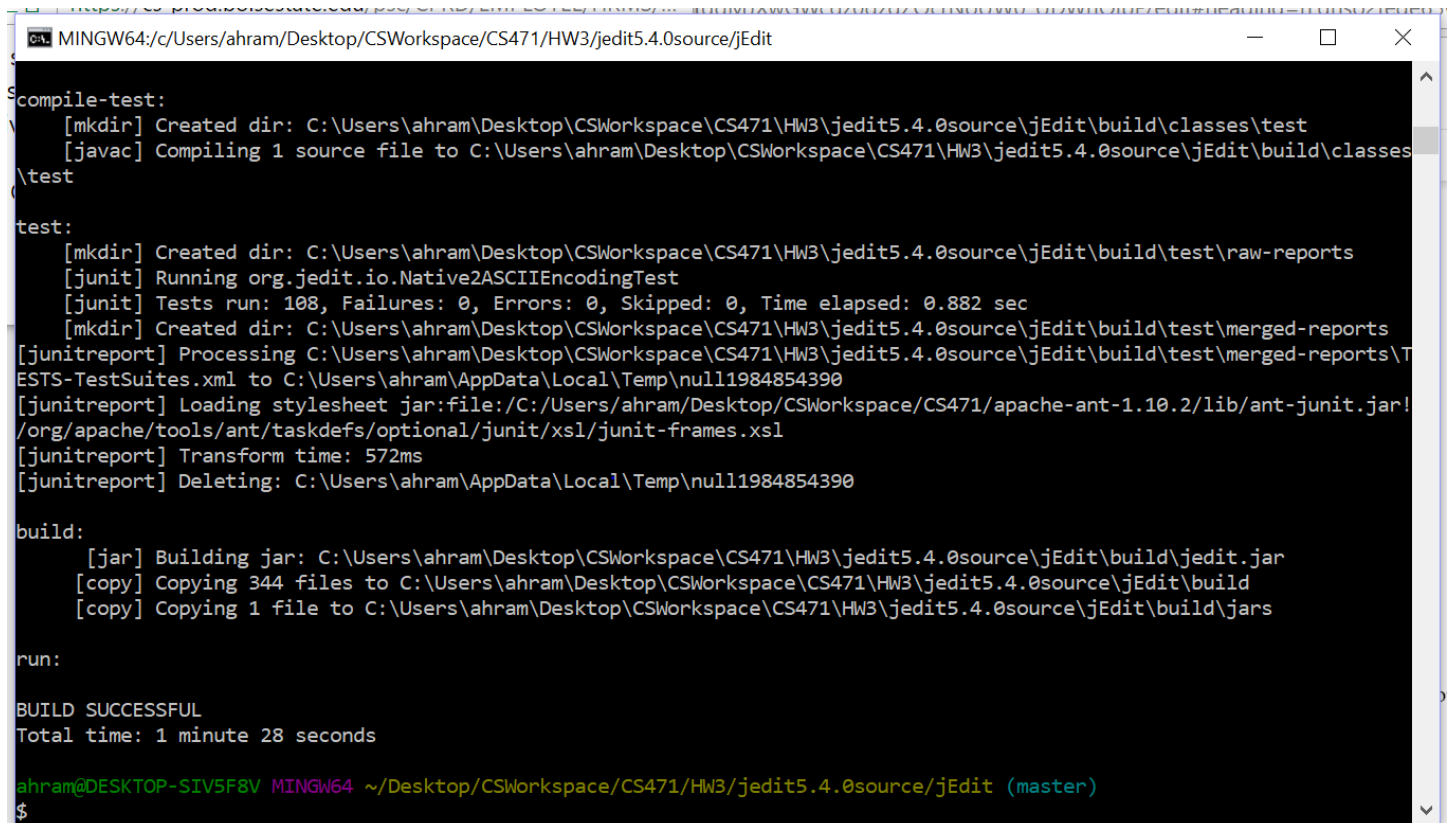
```
296 | jEdit.setColorProperty("view.pageBreaksColor", pageBreaksColor.g 301 | jEdit.setColorProperty("view.pageBreaksColor", pageBreaksColor.getSelectedColor())
297 |
298 | jEdit.setIntegerProperty("view.electricBorders",electricBorders 302 |
299 | .isSelected() ? 3 : 0); 303 | jEdit.setIntegerProperty("view.electricBorders",electricBorders
300 | AntiAlias nv = new AntiAlias(jEdit.getProperty("view.antiAlias") 304 | .isSelected() ? 3 : 0);
301 | nv.set(antiAlias.getSelectedIndex()); 305 | AntiAlias nv = new AntiAlias(jEdit.getProperty("view.antiAlias"));
302 | jEdit.setProperty("view.antiAlias", nv.toString()); 306 | nv.set(antiAlias.getSelectedIndex());
303 | jEdit.setBooleanProperty("view.fracFontMetrics",fracFontMetrics. 307 | jEdit.setProperty("view.antiAlias", nv.toString());
304 | jEdit.setBooleanProperty("stripTrailingEOL", stripTrailingEOL.is 308 | jEdit.setBooleanProperty("view.fracFontMetrics",fracFontMetrics.isSelected());
305 | jEdit.setBooleanProperty("completeFromAllBuffers", completeFromA 309 | jEdit.setBooleanProperty("stripTrailingEOL", stripTrailingEOL.isSelected());
306 | jEdit.setBooleanProperty("insertCompletionWithDigit", insertComp 310 | jEdit.setBooleanProperty("completeFromAllBuffers", completeFromAllBuffers.isSelected()
311 |
312 +
313 + jEdit.setBooleanProperty("insertLinesUnderText", insertLinesUnderText.isSelected())
314 +
307 | jEdit.setIntegerProperty("options.textarea.lineSpacing", 315 | jEdit.setIntegerProperty("options.textarea.lineSpacing",
308 | Integer.valueOf(lineSpacing.getText()); 316 | Integer.valueOf(lineSpacing.getText());
309 | } //}}} 317 | } //}}}
310 |
311 | {{{{{ Private members 318 |
312 | private FontSelector font; 319 |
320 | private JCheckBox fontSubst; 321 | private FontSelector font;
322 | private FontList fontSubstList; 322 | private JCheckBox fontSubst;
323 | private JCheckBox fontSubstSystemFonts; 323 | private FontList fontSubstList;
324 | private ColorWellButton foregroundColor; 324 | private JCheckBox fontSubstSystemFonts;
325 | private ColorWellButton backgroundColor; 325 | private ColorWellButton foregroundColor;
326 | 326 | private ColorWellButton backgroundColor;
```

Figure 6 git diff visualization using Visual Studio Code from TextAreaOptionPane.java (<https://code.visualstudio.com/>).

```
335 | private JCheckBox pageBreaks; 342 | private JCheckBox pageBreaks;
336 | private ColorWellButton pageBreaksColor; 343 | private ColorWellButton pageBreaksColor;
337 | private JCheckBox electricBorders; 344 | private JCheckBox electricBorders;
338 | private JComboBox<String> antiAlias; 345 | private JComboBox<String> antiAlias;
339 | private JCheckBox fracFontMetrics; 346 | private JCheckBox fracFontMetrics;
340 | private JCheckBox stripTrailingEOL; 347 | private JCheckBox stripTrailingEOL;
341 | private JCheckBox completeFromAllBuffers; 348 | private JCheckBox completeFromAllBuffers;
342 | private JCheckBox insertCompletionWithDigit; 349 | private JCheckBox insertCompletionWithDigit;
343 |
344 |
345 +
346 + private JCheckBox insertLinesUnderText;
347 + private ColorWellButton insertLineColor;
348 +
342 | private JTextField lineSpacing; 354 | private JTextField lineSpacing;
343 | //}}} 355 | //}}}
344 |
345 | {{{{{ FontList class 356 |
346 | /** 357 |
347 | * The substitution font list widget. Shows a JList with the 358 | /**
348 | * list of fonts and buttons that allow the user to manipulate 359 | * The substitution font list widget. Shows a JList with the
349 | * the list. 360 | * list of fonts and buttons that allow the user to manipulate
350 | */ 361 | * the list.
351 | 362 | */
```

Figure 7 git diff visualization using Visual Studio Code from TextAreaOptionPane.java (<https://code.visualstudio.com/>).

**Time required for completing this assignment:**



```
MINGW64: c:/Users/ahram/Desktop/CSWorkspace/CS471/HW3/jedit5.4.0source/jEdit
$ compile-test:
[mkdir] Created dir: C:\Users\ahram\Desktop\CSWorkspace\CS471\HW3\jedit5.4.0source\jEdit\build\classes\test
[javac] Compiling 1 source file to C:\Users\ahram\Desktop\CSWorkspace\CS471\HW3\jedit5.4.0source\jEdit\build\classes\test
test:
[mkdir] Created dir: C:\Users\ahram\Desktop\CSWorkspace\CS471\HW3\jedit5.4.0source\jEdit\build\test\raw-reports
[junit] Running org.jedit.io.Native2ASCIIEncodingTest
[junit] Tests run: 108, Failures: 0, Errors: 0, Skipped: 0, Time elapsed: 0.882 sec
[mkdir] Created dir: C:\Users\ahram\Desktop\CSWorkspace\CS471\HW3\jedit5.4.0source\jEdit\build\test\merged-reports
[junitreport] Processing C:\Users\ahram\Desktop\CSWorkspace\CS471\HW3\jedit5.4.0source\jEdit\build\test\merged-reports\TESTS-TestSuites.xml to C:\Users\ahram\AppData\Local\Temp\null1984854390
[junitreport] Loading stylesheet jar:file:/C:/Users/ahram/Desktop/CSWorkspace/CS471/apache-ant-1.10.2/lib/ant-junit.jar!/org/apache/tools/ant/taskdefs/optional/junit/xsl/junit-frames.xsl
[junitreport] Transform time: 572ms
[junitreport] Deleting: C:\Users\ahram\AppData\Local\Temp\null1984854390
build:
[jar] Building jar: C:\Users\ahram\Desktop\CSWorkspace\CS471\HW3\jedit5.4.0source\jEdit\build\jedit.jar
[copy] Copying 344 files to C:\Users\ahram\Desktop\CSWorkspace\CS471\HW3\jedit5.4.0source\jEdit\build
[copy] Copying 1 file to C:\Users\ahram\Desktop\CSWorkspace\CS471\HW3\jedit5.4.0source\jEdit\build\jars
run:
BUILD SUCCESSFUL
Total time: 1 minute 28 seconds

ahram@DESKTOP-SIV5F8V MINGW64 ~/Desktop/CSWorkspace/CS471/HW3/jedit5.4.0source/jEdit (master)
$
```

Activity	Approximate Time Required (in minutes)
Compiling and running the software	1 minute 28 seconds
Implementing the change request	10 seconds