CS 471: Software Engineering
Spring 2018
Homework 3 – Implementation of an advanced maintenance task in an unfamiliar Open Source Software (jEdit)

Due date: Wednesday, March 21, 2018 (at the end of the day)

1. Brief Description

This assignment requires you to practice **compiling** and **modifying** an unfamiliar software system, by adding a more complex feature than the one you added in the previous (muCommander Splash Screen) homework. As a student, most class projects are small enough that you can understand the entire program. In industry, it is generally impossible for one person to understand the entire product. Being able to navigate a large and unfamiliar codebase is a fundamental and necessary skill.

A software engineer is expected to compile, install, test, deploy, debug and troubleshoot complex software written in heterogeneous programming languages and environments. Writing code is only a small portion of the job. In other words, a software engineer is expected to "make things work" and solve any software related issue.

2. Homework Report

It is recommended to make a copy of the `CS471_S18_HW3_Report_Template` template (also found under "Homework Assignments" in https://piazza.com/boisestate/spring2018/cs471/resources) and to start completing the sections of this report as you progress through the homework (in this way, the information added to the report will be fresh in your memory).

3. Software System

You will be compiling and adding a more complex feature to the jEdit open-source software system. The purpose is to give you an exposure to a large, and unfamiliar codebase. Version 5.4.0 of jEdit has 596 Java files containing ~123KLOC (without comments) and ~50KLOC of comments (see statistics below generated using a simple utility named `cloc (count lines of code)`)

```
$ cloc jEdit
    1649 text files.
    1299 unique files.
     824 files ignored.

github.com/AlDanial/cloc v 1.72  T=3.00 s (356.7 files/s, 104418.7 lines/s)
-------------------------------------------------------------------------------
Language                     files          blank        comment           code
-------------------------------------------------------------------------------
Java                           596          21444          49988         123399
XML                            296           8975           7202          95577
HTML                           149            451             73           2302
Ant                              1             77              6           2069
CSS                              2              3             31            487
XSLT                             3             75             70            283
DTD                             11             60             53            216
Clojure                          1             18              9            149
DOS Batch                        1             12              0             61
Markdown                         2             15              0             48
Bourne Shell                     6             14             26             42
C++                              1              2              4              6
Python                           1              1              2              6
-------------------------------------------------------------------------------
SUM:                          1070          31147          57464         224645
-------------------------------------------------------------------------------
```

The official website for jEdit (http://www.jedit.org/) is geared towards end users. As a developer, you will want to refer to their developer page (http://www.jedit.org/index.php?page=devel), **although most of these links are broken, incomplete, inaccurate or outdated. This is a very**

common phenomenon with legacy code.

4. Compiling and Modifying the Software

You have the full freedom in this assignment to use whatever tools you deem appropriate for compiling and making the change. However, it is recommended to follow these steps:

- Download the source code of jEdit v5.4.0 from the download page (http://www.jedit.org/index.php?page=download), which will direct you to the SourceForge page (http://sourceforge.net/projects/jedit/files/jedit/5.4.0/jedit5.4.0source.tar.bz2/download)
- The exacted source code archive is not a git repository. For the purpose of this homework assignment:
  - In the extracted jEdit folder initialize a git repository using:

    ```
    git init
    ```
  - Commit ALL files in the jEdit folder as the initial commit
    - NOTE: using this local git repository will not only help you revert back to a "known-good state" if something goes wrong, but it will also help you in generating the diff of your changes for the homework submission
- Use the following command to build and run jEdit (see the `README.SRC.txt` file inside the root folder of the jEdit source code) using the `Apache Ant` builder (http://ant.apache.org/), which has to be installed on your machine (if it's not already installed)

  ```
  ./ant run
  ```
- you can import jEdit in any IDE (e.g., `Eclipse`, `IntelliJ IDEA`, etc.) in order to **navigate**, **search** and **implement** the change request in jEdit
- OPTIONAL: If you imported correctly jEdit in the IDE, you should be able to **compile** and **run** it within the IDE.
  - Remember: You can still **compile** jEdit from command line, even if you cannot **compile** it from the IDE

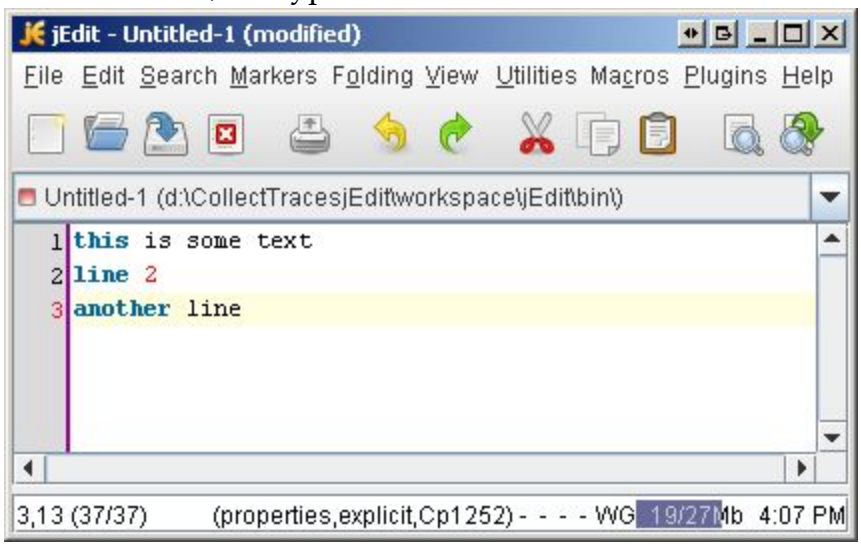
5. Feature Request / Maintenance Task

Once you have successfully **compiled** and **ran** the software, you are ready to start the implementation of the following feature request:

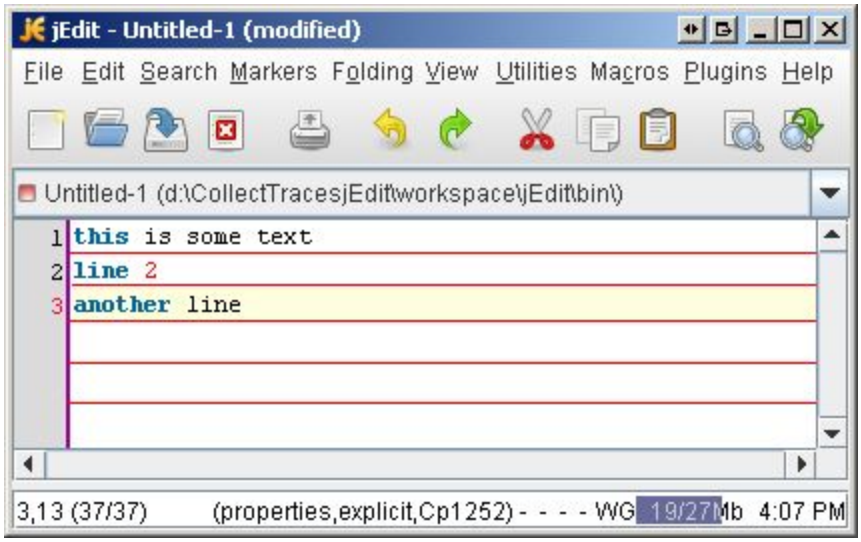
Enable Notepad-like style

Add a new feature to jEdit which allows lines to be drawn beneath the text to simulate the look of a paper notepad.

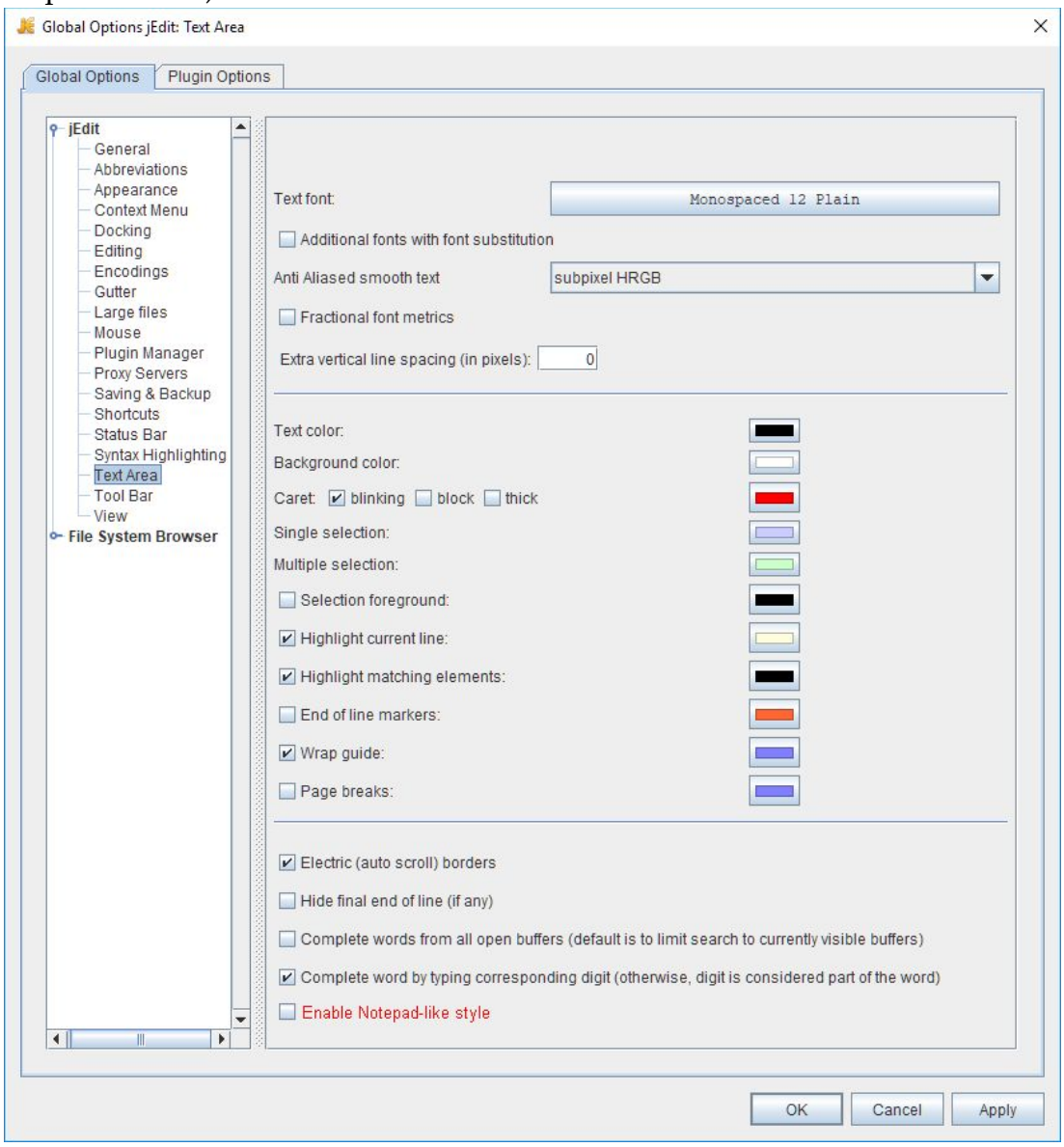
For example, without this feature, the typical text area looks like this:



With the new feature, the text area should look similar to the image below (notice the red lines under each text line):



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", as in the image below (notice the new option in red).



6. Homework submission

Submit via Blackboard (see HW3jEdit assignment) a single pdf file named

`CS471_S18_HW3_[LastName].pdf`, based on the `CS471_S18_HW3_Report_Template` template found under "Homework Assignments" in https://piazza.com/boisestate/spring2018/cs471/resources. The template contains ample description regarding the information you need to submit.

Your submitted report will contain screenshots of your successful software compilation and a link to a short video capturing the implemented feature (the video can be taken either with your phone camera or through screen capture software such as OBS Studio). Therefore, you do not need to submit your source code for this HW, but you can get 5 BONUS points if you submit a patch file (see rubric below).

7. Grading Rubric

The maximum points for this homework representing 10% of the final grade is 100, and the points are distributed as follows:

Item (see CS471_S18_HW3_Report_Template file)	Points
Detailed Development Environment Description	3
Compiling/Building and Running Issues Description	12
Screenshot of successful compilation	15
Concept Location	20
Successful Implementation Video	25
Highlighted Source Code of the Implementation in a Side-by-Side readable format	20
Time Required for Completing this Assignment	5

If you also submit via Blackboard a patch file that includes the implementation of your changes, you will receive 5 BONUS points (e.g., your maximum grade for this homework could be 105/100).