Whitebox Test
For "WikiDroid" app

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Introduction

This document associates the black box defects with the actual code, and records the white box issues.

The items listed in this document are recorded and corrected in detail at
https://github.com/aoisky/Bonjour/commit/3248100cf62bf14a0de858397a8292 0897b1596d

Note: some global defects and documentation defects that do not have specific module associated have been skipped. For the 3rd party components, the bug trackers are at:

- https://github.com/ManuelPeinado/GlassActionBar/issues
- https://github.com/PomepuyN/BlurEffectForAndroidDesign/issues
- https://github.com/gregko/WebArchiveReader/issues
- http://bugs.icu-project.org/trac/report/1 (1634 known bugs)

Black box Defects

Test Set 1: Running the app

The issues in this category are, to a large extent, related to the 3rd party code used in the project. They did not check the compatibility issue of those projects and seemed not to test the program on any real device.
How to fix: test the program on a real device, and change or remove the 3rd party components if they cause compatibility issue.

Test Set 2: Searching Articles by Keywords

#	Severity	Defects	How To Fix
0	S3	There is no prompt for invalid keywords like empty string or string consisting of only whitespaces. 　• The user doesn't know whether the app is searching or not, which is confusing.	Module: `MainActivity.java` How to fix: Delete lines 229 and 234 so the sanity check part will not be surrounded by `if (false) {}`
1 *	S1	The app shows wrong page for [a-zA-z]+ entries. 　• For example, open the app, search for "`software`".	Refer to #2 of White box defects.

		• The app gives entry "`software engineering`" rather than the entry "Software" http://en.wikipedia.org/wiki/Software	
2	S2	When the entry to search for does not exist, the app picks up one of the entries in Wikipedia's search result. • For example, search for "`gk104`" • Wikipedia shows the entry does not exist nd gives a search page (http://en.wikipedia.org/w/index.php?search=gk104) • The app however, picks up the third entry on the search page. The app displays entry "`Geforce 700 Series`"	Refer to #2 of White box defects.
3 *	S1	The app shows wrong page for [-\s\w]+ entries. • Search for entry "`Xi Jinping`" • Instead of showing the correct entry (http://en.m.wikipedia.org/wiki/Jinping_Xi), the app gives the entry "`Presidents of People's Republic of China`".	Refer to #2 of White box defects.
4 *	S2	The app shows wrong page when searching for quoted entries. • Search for entry "`"Jinping Xi"`" (without the single quotes) • The app gives the entry "China National Symphony Orchestra", which is actually the last entry in the search list (http://en.m.wikipedia.org/w/index.php?search=%22jinping+xi%22) • Same issue with keyword "`Abercombie & Fitch`"	Refer to #2 of White box defects.

Test Set 3: Links and Tabs

#	Severity	Defects	How To Fix
1	S1	The app can open at most 7 tabs; opening the 8th tab will cause the program to crash. • The backlog specified that the app should support open 10 tabs.	Module: tab/TabManager.java, MainActivity.java line 267 How to fix: `mToast` with value `null` caused app to crash; it should specify a message when reaching maximum number of tabs As for the issue of maximum of 7 tabs only, refer to #1 of White box defect.
2	S1	The app crashes when closing the first (default) tab. • Open the app, click the X button on the tab, and then app will crash. • This happens even when you have multiple tabs open; closing the first tab and app will crash.	Module: `MainActivity.java`, line 141 How to fix: Position should not minus by 1, change 'position – 1' to 'position', also check if position equals 0
3	S1	Click the X button on the nth tab and the (n-1)th tab actually gets closed. • This is a typical off-by-one bug.	Module: `MainActivity.java`, Line 141. How to fix: In the mentioned line, change "position - 1" to "position"
4	S1	Tap and hold on a link but the program does not respond. • It is expected that one tap and hold on the link, and a menu should pop up, and then the user could choose "Open in the new tab" to open the link in background.	Module: `MainActivity.java` How to fix: Add an on-tap-and-hold listener that if the target is a link, pop up a menu.
5	S3	When one navigates through links	Module:

		and reaches a page of Desktop version (e.g., links of "this page needs to improve", etc.), the layout goes totally wrong. • We give this problem "Workaround" level because most users tend not to click such kinds of links.	`activity_main.xml` How to Fix: Fix the layout of the UI by defining the layout_width and height of the FrameLayout
6	S1	The star (favorite icon) of tabs is actually associated with the *number* (the position number, more precisely) of tabs instead of the actual tab *object*. Some related phenomena are: • Say we have tabs 1,2, and 3, and tab 2 is starred. After closing tab2, the previously tab 3 becomes starred, while it is expected that no tabs are starred. • Still assume we have tabs 1, 2, and 3, where tab 3 is starred. Closing tab 3 and adding a new tab, one gets a starred new tab (this is more likely to happen than not).	Module: `tabs/TabListAdapter` How to fix: In the function `getView`, instead of using position as the key to the checkboxes, use the hash of the tab object as the key so that keys are associated with the specific object.

Test Set 4: At Exit

#	Severity	Defects	How To Fix
1	S1	The app does not save article status or tab status at all. • It doesn't save anything even just moving the app to background and then back to foreground.	Module: `MainActivity.java` How to fix: Add code to save and restore current state in the listeners `onSaveInstanceState` and `onRestoreInstanceState`.

Test Set 5: Save for Offline Access

#	Severity	Defects	How To Fix
1	S1	The app does not save anything at all; not to mention save for offline access.	Module: `ListSaveArticle.java` How to fix: The code is there but there

#	Severity	Defects	How To Fix
			is no function calls it. Link the component to the main program.
2	S1	The command "Save article" does not work at all. Thus one cannot save articles even manually.	Module: `MainActivity.java` How to fix: Link the menu item with the function that calls `Utils.saveArchive`
3	S1	The app crashes _whenever_ one clicks "List of Articles Saved" command. • It is labeled S1 because it is one of the core functionalities of the app.	Module: `MainActivity.java` How to fix: Remove the malicious function that cause the program to crash, and link the listener to `ListSaveArticles` module.
4	S2	App cannot withstand volume test. • One can crash the app by opening 4 "Adolf Hitler" entry pages, one "War in Afghanistan" page, and a "Gun laws in the United States by states" page. There are only 6 tabs and the program would crash.	Module: it is a global issue not specific to a particular module. How to fix: Explicitly check memory usage of the app and prompt user if opening a new tab may cause memory shortage.

Test Set 6: Miscellaneous Commands

#	Severity	Defects	How To Fix
1*	S1	"Share" button does not work. • Click on the share button and there is no response from app at all. • It is expected that the app shows a menu of the options one can use to share the article with other people.	Module: `MainActivity.java`, line 285-288 How to fix: The app should call the `startIntent` function to start the `shareIntent` defined in the app
2	S1	"Settings" button will close the app. • This seems an intentioned behavior of the app.	Module: `MainActivity.java`, line 300

			How to fix: The setting page is not implemented; remove the function call `tothis.finish();` and implement the function.
3	S2	The language setting of the app can be changed only once; after that when one wants to switch to another language the loaded language list is always empty. • Some charsets are missing in the system.	Module: `Languages.java`, line 78 How to fix: The `getAvailableLanguages` function only call English api; if the web page is changed to another language, the program cannot fetch language list anymore. Change the URL to one specific to the current language.
4	S3	Some languages in the language list are shown as blank. • A typical page is "Software Engineering" one can get by searching for "software".	Module: `Languages.java` How to fix: The right-aligned languages show up at the right of the list, if the screen has low resolution, user cannot see them. It can be fixed by specifically setting the width of the language list box.
5	1	When one switches to the nth language in the language list, the page actually loads the $(n+1)^{th}$ language. • This is marked S1 because of the 3rd defect listed in the table – once the language is changed one cannot change the language anymore.	Module: `Languages.java`, line 94-105 How to fix: Malicious code `i == 9` caused the strange behavior of language list. Remove all "i==9" conditions.
6	S2	The "Cancel" button on the language selection pane actually works as "Submit" or "Confirm". When clicked it submits the query and changes the language.	Module: `values/string.xml` How to fix: The string value `dialog_ok` should set to "OK" or

		Also there is no actual "Cancel" button at all.	"Confirm" instead of "Cancel".
7*	S2	One cannot zoom-in or zoom-out a page. • Zoom function is listed on the backlog.	Module: `MainActivity.java` How to fix: Need to implement the functions corresponding to zoom gestures.
8	S1	Click "List of Articles Saved" command and app will crash. • We give this issue a "Critical" level because offline browsing functions is one of the critical reasons for the app to exist.	Module: `ListSaveArticles.java`, line 103 How to fix: Need to check if no saved file in the folder (Check null pointer)
9	S1	There is no in-page keyword search function. • It was alleged one of the core features of the app.	Module: No module related to this currently. How to fix: Need to implement the in-page search function

* Functionality removed in the new backlog.

Test Set 7: Non-functional Tests

#	Severity	Defects	How To Fix
1	S2	The search bar, toggle menu (containing login, add to favorite, watchlist, and other items), and other elements from Wikipedia web page shows in the article pane. This is confusing because they seem to be within the scope of the app, or overlap the functions of the app.	Module: `WikiDroidHttpClient.java` How to fix: Crawl the target DOM on the webpage more precisely and do not render unrelated DOMs that confuse the user.
2	S3	When loading languages, it prompts "Loading ***unavailable*** languages…". The word "unavailable" should be "available".	Module: `values/strings.xml` How to fix: Change the value of "dialog_language_loading" to the "Loading available languages"

3	S3	The command string "List of _Articles Saved_" should be "_List of Saved Articles_".	Module: `values/strings.xml` How to fix: Change value of "`action_show_saved_article`" to "`List of Saved Articles`"
4	S2	The app has serious compatibility issue. It can only work on Android emulator of version 4.4.2 with Galaxy Nexus profile, and does not work on other API versions. It does not work on Kindle Fire with Android 4.4.2, either.	Module: All How to fix: Test various devices and make sure that basic functionality of the app works and it doesn't crash.
5	S3	Pages load annoyingly slowly.	Module:All How to fix: Streamline page loading process in ActivityMain and other Java files.

White box Defects

#	Defects	How to correct	Module	Severity
1	The default value for the maximum number of tabs is not effective in the program.	In constructor `TabManager`, if the argument `tabLimit` is larger than `DEFAULT_TAB_LIMIT`, or is less than 1, override the value with default one.	`tab/Tab Manager .java`	S3
2	Searching can result in `IndexOutOfBoundException`	In onPostExecute function, change line 55 to `webPage.loadUrl(resultList.get(0).getLink());`	`search/ SearchA rticle. java`	S2
3	In function `getLanguageURLs`, When choosing Spanish language ("es"), the program adds a malicious page "Never_Gonna_Give_You_Up".	Remove lines 91, 92, 93, and remove the "else" in line 94 of the file `languages/Languages.java`	`languag es/Lang uages.j ava`	S2

4	Redundant languages may show up on the language list, and possibly out-of-bound ArrayList read operation may occur, depending on how many languages are available in the article, and which language the user chooses.	Change lines 91 – 106 of `languages/Languages.java` to one single line `URLs.add(nl.item(i).getTextContent());` (This also fixes the off-by-one issue when selecting a language, revealed in the black box table.)	`languages/Languages.java`	S1
5	The function `findCurrentLanguage` only used for writing bugs.	Remove the function and remove all the statements related to the function. Only keep the `URLs.add(nl.item(I).getTextContent());`	`languages/Languages.java`	S2
6	There are many implemented but unused functions like save links, save articles.	For the non-functioning buttons, add the function calls to the event listeners.	`Utils.java`	S2
7	There is no network check implemented – it is just a Boolean constant. The network check is just a boolean value.	Remove the code that will never be executed and implement a working network availability check mechanism.	`MainActivity.java`	S3
8	There is no share article options or any social media integration in the application	Add code for the respective social media connection so that articles can be shared.	MainActivity.java	S3
9	There are three conditional statements of "i == 9" in the getAvailableLanguages function which caused the language selection chooses the wrong language	Remove all "i == 9" conditions in the getAvailableLanguages and only keep languages.add(nl.item(i).getTextContent());	Languages.java	S2
10	At line 50, it is an appropriate way to print debug information.	Modify and use log.d instead.	`Languages.java`	S3
11	At line 104 - 108, the code does not check if the `fileOnDir` is null.	Add code for checking whether `fileOnDir` is null or not.	`ListSaveArticles.java`	S3