Curtin University – Department of Computing

Assignment Cover Sheet / Declaration of Originality

Complete this form if/as directed by your unit coordinator, lecturer or the assignment specification.

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Unit name:	Software Engineering Concepts	Unit ID:	COMP 3003
Lecturer / unit coordinator:	Dr. David Cooper	Tutor:	Mr. Dharshana Kasthurirathna
Date of submission:	26/10/2017	Which assignment?	(Leave blank if the unit has only one assignment.)

I declare that:

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- The work I am submitting is *entirely my own*, except where clearly indicated otherwise and correctly referenced.

- I have taken (and will continue to take) all reasonable steps to ensure my work is *not accessible* to any other students who may gain unfair advantage from it.

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Signature: *Benutts*

Date of signature: 26/10/2017

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SEC Assignment 1: Table of Contents

Class Structure

There are 7 classes in total:

- NewsMain:
  Contain the main method and is where arguments are received and every other class is instantiated. Most of the logic including threading and list management takes place here.

- NewsPlugin:
  Is an interface that any plugin for the application has to implement in order to be accepted.

- NewsPluginLoader:
  Contains a method that when passed the relative path to where the plugin class will be built (from command line arguments like 'build/classes/arstechnicaPlugin.class') it will create a instance of that class and cast it to the NewsPlugin Interface. This casted object is return to the NewsMain to be stored in a Hashmap.

- arstechnicaPlugin:
  Used in order to be casted as a NewsPlugin object and stored in a hashmap in NewsMain. The hashmap is iterated through and the objects are run in separate threads utilizing the methods in each plugin. The methods in this plugin can return plugin name or return delay (update frequency) or can download and parse the arstechnica webpage for headlines and return an arraylist of string arrays that contain the headlines.

- bbcPlugin:
  Used in order to be casted as a NewsPlugin object and stored in a hashmap in NewsMain. The hashmap is iterated through and the objects are run in separate threads utilizing the methods in each plugin. The methods in this plugin can return plugin name or return delay (update frequency) or can download and parse the bbc webpage for headlines and return an arraylist of string arrays that contain the headlines.

- nytimesPlugin:
  Used in order to be casted as a NewsPlugin object and stored in a hashmap in NewsMain. The hashmap is iterated through and the objects are run in separate threads utilizing the methods in each plugin. The methods in this plugin can return plugin name or return delay (update frequency) or can download and parse the nytimes webpage for headlines and return an arraylist of string arrays that contain the headlines.

- pluginscheduler:
Contains a method that initializes a java.util.Timer to schedule TimerTasks. An instance of this class is used to schedule all TimerTasks for each plugin. If at any moment all tasks need to be stopped the pluginscheduler object can be reinitialized. Thus if needed to restart the TimerTasks then the newly initialized object's method can be called

Threading Arrangements

Periodic headline retrieval:
For each dynamically loaded plugin a TimerTask is started on its own respective thread. Each of those timer tasks call a method from its plugin that implements Callable. As such, the callable methods are run on in a another thread from within the TimerTask.

One time headline retrieval (update all button):
For each plugin a TimerTask thread is created again and calls a callable method that runs on another thread. This TimerTask only runs once so the thread is closed upon finishing the tasks.

Pausing and Restarting headline retrieval (cancel button):
Each timer is purged and cancelled (as well as the scheduler object reinitialized) therefore ending all the threads that were associated with them. Similar threads are restarted after using the reinitialized scheduler to call its timer method.

Clock:
Utilises a javax.swing.Timer and runs on the EDT.

All shared variables accessed by threads were synchronized by using synchronized type arraylists and by making methods that utilized them synchronized as well as in addition to that making synchronized block (locked by the variable itself) around any editing of those variables.

Build Setup

In the root folder each plugin is a subproject and all other classes are the core program subproject. The coreprogram's dependencies are the plugin subprojects. The plugins' dependencies is the JSOUP library and the coreprogram subprogram.

References

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