

CS 635 Advanced OO Design and Programming
Fall Semester, 2018
Assignment 4
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Web Page Update Notifier
Due Nov 27

There are times that one would like to know when a web page has been updated. For example it would be nice to know when the assignment page for this course is changed. You will build a small system to notify people when web pages have been updated. There are a number of different things that can happen when a web page has changed. We could print an notice in a terminal window, we could send an email message, we could send a text message. We may want to run the program on a server and notify multiple people when a page changes. So a page may have one or more people interested in that page. So this is a reasonable situation for the Observer pattern. We will use RxJava (RxPy or RxSwift) for this.

You are to support three ways to notify a person that a page has changed. First just text sent to standard out (console). Second sending an email. Third sending a text message. Your program should read a file containing a list of URL of webpages. Each url starts a new line in the file. Each URL is followed by a space then the type of output (console, email, sms). If it is an email then we need the email address. If an sms we need two pieces of information: 10 digit phone number and name of the cell provider. Each piece of information is separated by a space. Some examples:

```
http://www.eli.sdsu.edu/courses/fall18/cs635/notes/index.html console
http://www.eli.sdsu.edu/index.html mail whitney@sdsu.edu
http://www.eli.sdsu.edu/courses/fall18/cs635/notes/index.html sms
6195943535 verizon
http://www.eli.sdsu.edu/courses/fall18/cs635/notes/index.html sms
6191234567 att
http://www.eli.sdsu.edu/index.html console
```

The program should be able to run indefinitely and notify users when one of the pages changes.

There are several technical issues related to implementing this assignment. Some are:

- How to know when a page has been updated
- How to send email
- How to send a text message
- How to test your code

The details will depend on the language you are using. I will add appendices for the language specific details later.

How to know when a page has been updated

When you fetch a statically generated pages they usually have a header indicating when the page was last modified. The server for our course web site does this. The details for fetching a web page are language specific.

How to send email

Each language has a library for sending email.

How to send a text message

Once you can send email it is easy to send a sms or mms message. Each service provider has an email address that you can send email to. They then convert the email to an sms or mms message and send it to the phone. If your phone number is 6191112223333 and you are with Verizon send email to 6191112223333@vzwpx.com and they will use the subject and content of the email go generate a mss message and send it to your phone. Mms seems to generate better message from email than sms. Below is the email address for some of the popular provider. There are better ways of sending sms/mms messages but the cost money.

Carrier	MMS gateway domain
Alltel	[insert 10-digit number]@mms.alltelwireless.com
AT&T	[insert 10-digit number]@mms.att.net
Boost Mobile	[insert 10-digit number]@myboostmobile.com
Cricket Wireless	[insert 10-digit number]@mms.cricketwireless.net
Project Fi	[insert 10-digit number]@msg.fi.google.com
Sprint	[insert 10-digit number]@pm.sprint.com
T-Mobile	[insert 10-digit number]@tmomail.net
U.S. Cellular	[insert 10-digit number]@mms.uscc.net
Verizon	[insert 10-digit number]@vzwpx.com

How to test your code

One problem is that web pages don't change each time you wish to test your program. While you can manually verify that an email or message was sent we need to be able to write automated tests. We will use factory method/abstract factory and mock objects. We will discuss this in class.

Grading

	Percent of Grade
Working Code	15%
Unit Tests	15%
Quality of Code	20%
Proper implementation of Patterns	50%

What to Turn in

Turn in hard copy of your code.

Late Policy

An assignment turned in 1-7 days late, will lose 5% of the total value of the assignment per day late. The eighth day late the penalty will be 40% of the assignment, the ninth day late the penalty will be 60%, after the ninth day late the penalty will be 90%. Once a solution to an assignment has been posted or discussed in class, the assignment will no longer be accepted. Late penalties are always rounded up to the next integer value.

Java

Accessing Webpages

Java the `java.net.URL` class and the `getLastModified()` method in `URLConnection` class to retrieve the last modified date of a web page. That is when the last modified date of the web page changes or is more recent than a given time. There are similar methods for content length. Below is an example of using the `URL` and `URLConnection` classes.

```
URL address = new URL("http://www.eli.sdsu.edu/");
URLConnection connect = address.openConnection();
```

```
long time = connect.getLastModified();  
Date modifiedDate = new Date(time);  
System.out.println(modifiedDate.toString());
```

Sending Email

Use JavaMail. For more information see: <https://java.net/projects/javamail/pages/Home>

Swift

Accessing Webpages

Use Alamofire. See your CS646 class notes for more details

Sending Email

To be added

Python

Accessing Webpages

To be added

Sending Email

To be added