Mobile Computing
Practical Assignment #2
Design and Development in Windows Phone
Application for the visualization of stock quotes
Stock exchange quotes and warnings

1. Scenario

People often own a set of business company shares, quoted in a stock exchange. Taking as a concrete example the New York Stock Exchange, each company share is represented by a small acronym, known as the company tick name (a sequence of letters, usually 3 or 4), and can be transacted by the current quote which can change at any time. An application that could display the current quote value of one or several stock companies and the variation in the last days or weeks would be very useful.

The presented information should be easy to read and understood and must include a graphical form when displaying variation.

Some examples of technological enterprises negotiated at the New York Stock Exchange include, by tick name: IBM, MSFT (Microsoft), CSCO (Cisco), AMZN (Amazon), HPQ (HP), GOOG (Google), AAPL (Apple), ORCL (Oracle),

2. Main use cases

The user should be able to define the share or shares in which he is interested. The most usual companies should be present in a dropbox or other kind of list, but the user should also be able to add new companies (by tick name).

For each of the shares of interest the user could also define a lower and higher value limit and subscribe a service that should warn the user if those limits are surpassed.

The user should also be able to know the current constitution of his *portfolio*, with its current value (per stock), presented in a table or graphical form. Another pertinent information is the evolution (last 30 days) of the value of each of the shares that are present in the *portfolio*.

An evolution graph is something like the one presented in the next figure.
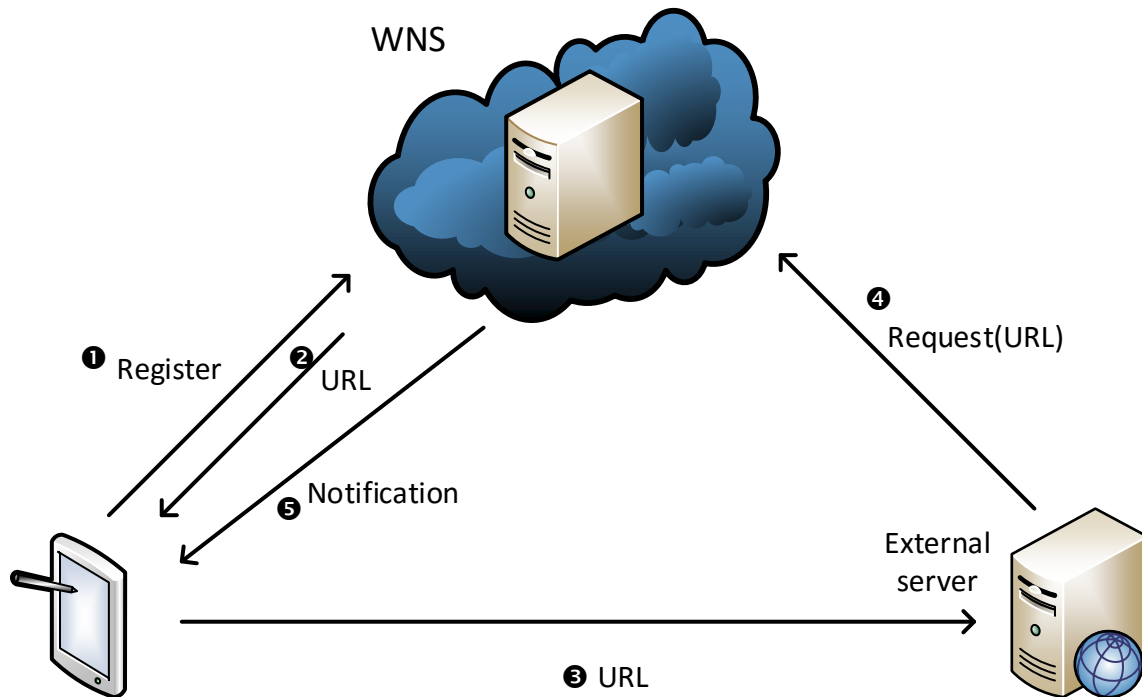

You can define different presentations for portrait and landscape modes.

When the application is not executing, and after subscription of one or more shares with its limits in a server, the user should receive push notifications with the current value of the main share he has subscribed and also notification warnings when the limits are surpassed. All the notifications should translate into the application tile modification ('tile notifications') and for the warnings into 'toast notifications'.

Push notifications involve an external service supplied by Microsoft capable of sending notifications to connected phones trough any TCP channel (even without the execution of any application). Another external service should ask the Windows Push Notification Service (WNS) to send the notifications with the data. It is this service (to be implemented) that receives the subscriptions from the phone users, tracks the quotes (for testing purposes, every minute) and asks for the notifications.

The involved players in this system are the following:

3. Obtaining the share data

Information about the New York Stock Exchange shares can be freely obtained using the Yahoo finance services. Two of the most used allow obtaining the current quote of a share or a set of shares, and the evolution of a share through a certain time period. The results come in textual form using the CSV format (values separated by commas and lines by white space (return, line feed, space)).

For obtaining the current quote, do a HTTP request with the following format:
    http://finance.yahoo.com/d/quotes?f=sl1d1t1v&s=<tick name list>
where the <tick name list> is a list of ticks separated by commas.
The result includes in each line the current quote, date and time of that quote and the number of shares exchanged in the current session (try it in a browser to see the format).

For obtaining the evolution of a quote you can use the HTTP request:
    http://ichart.finance.yahoo.com/table.txt?<pars a to g>&s=<tick name>

where:
<tick name> - company tick name
<pars a to g> - parameters indicating the initial and final date and the periodicity of the data.
    a – initial month (0 denotes January, and so on)
    b – initial day
    c – initial year
    d – final month
    e – final day
    f – final year
    g – periodicity (d - daily; w - weekly; m - monthly)

An example for the Apple company, between October 5 and 19, 2015, daily, is:
    http://ichart.finance.yahoo.com/table.txt?a=9&b=5&c=2015&d=9&e=19&f=2015&g=d&s=AAPL

The result will come in text CSV, one line for each quote (try it in a browser to see the format).

Values for the session opening, session closing, minimum and maximum and the adjusted value (minus dividends) are included, as well as the number of shares exchanged in the session.
Days when the stock exchange is closed are not included.

4. Design and development

You should design and implement the application capable of comply with the described functions and demonstrate its use. The application should have a comfortable and easy to use interface. You can add any functionalities considered convenient. You should use the Windows Universal platform, with Phone extensions, for the development.

You should also write a report, describing the architecture, data schemas, included features and performed tests. The application 'how to use' should also be included in the report, presenting screen capture sequences.