

ITIS/ITCS 4180/5180 Mobile Application Development  
**Midterm**  
In-Class Programming Assignment

---

**Basic Instructions:**

1. This is the Midterm Exam, which will count for 15% of the total course grade.
2. In every file submitted you **MUST** place the following comments:
  - a. Your Full Name.
3. This Midterm is an individual effort. Each student is responsible for her/his own Midterm and its submission.
4. Once you have picked up the exam, you may not discuss it in any way with anyone until the exam period is over.
5. During the exam, you are allowed to use the course videos, slides, and your code from previous homeworks and in class assignments. You are **NOT** allowed to use code provided by other students or from other sources.
6. Answer all the exam parts, all the parts are required.
7. Please download the support files provided with the Midterm and use them when implementing your project.
8. **Export your Android project as follows:**
  - a) From eclipse, choose “Export...” from the File menu.
  - b) From the Export window, choose General then File System. Click Next.
  - c) Make sure that your Android project for this Midterm is selected. Make sure that all of its subfolders are also selected.
  - d) Choose the location you want to save the exported project directory to. For example, your Desktop or Documents folder.
  - e) The first time you export, make sure you select Create directory structure for files.
  - f) Click Finish, and then go to the directory you exported the project to. Make sure the exported directory contains all necessary files, such as the .java and resource files.
9. Submission details:
  - a) When you submit the Midterm, compress your exported Android project into a single zip file. The format of compressed file name is:
    - i. Midterm.zip
  - b) You should submit the Midterm through Moodle:
    - i) Submit the zip file.
10. **Failure to do the above instructions will result in loss of points.**
11. **Any violation of the rules regarding consultation with others will not be tolerated and will result disciplinary action and failing the course.**

## Midterm (100 Points)

In this assignment you will make simple HTTP requests and will parse the BBC RSS feed data.

```
<rss xmlns:media="http://search.yahoo.com/mrss/" xmlns:atom="http://www.w3.org/2005/Atom" version="2.0">
  <channel>
    <title>BBC News - Science & Environment</title>
    <link>http://www.bbc.co.uk/news/science_and_environment/#sa-ns_mchannel=rss&ns_source=PublicRSS20-sa</link>
    <description>The latest stories from the Science & Environment section of the BBC News web site.</description>
    <language>en-gb</language>
    <lastBuildDate>Wed, 24 Sep 2014 01:24:10 GMT</lastBuildDate>
    <copyright>Copyright: (C) British Broadcasting Corporation, see http://news.bbc.co.uk/2/hi/help/rss/4498287.stm for terms and
conditions of reuse.</copyright>
    <image>
      <url>http://news.bbcimg.co.uk/nol/shared/img/bbc_news_120x60.gif</url>
      <title>BBC News - Science & Environment</title>
      <link>http://www.bbc.co.uk/news/science_and_environment/#sa-ns_mchannel=rss&ns_source=PublicRSS20-sa</link>
      <width>120</width>
      <height>60</height>
    </image>
    <ttl>15</ttl>
    <atom:link href="http://feeds.bbc.co.uk/news/science_and_environment/rss.xml" rel="self" type="application/rss+xml"/>
    <item>
      <title>India Mars mission arrives in orbit</title>
      <description>India becomes the fourth nation to put a satellite into orbit around Mars, as Mangalyaan arrives to study the Red
Planet's atmosphere.</description>
      <link>http://www.bbc.co.uk/news/science-environment-28268186#sa-ns_mchannel=rss&ns_source=PublicRSS20-sa</link>
      <guid isPermaLink="false">http://www.bbc.co.uk/news/science-environment-28268186</guid>
      <pubDate>Wed, 24 Sep 2014 07:16:26 GMT</pubDate>
      <media:thumbnail width="66" height="49" url="http://news.bbcimg.co.uk/media/images/77782000/jpg/_77782576_70969770.jpg"/>
      <media:thumbnail width="144" height="81" url="http://news.bbcimg.co.uk/media/images/77782000/jpg/_77782577_70969770.jpg"/>
    </item>
    <item>
      <title>China and US pledge climate action</title>
      <description>China and the US agree they must lead the rest of the world in curbing emissions to combat climate change, as a
major UN summit closes in New York.</description>
      <link>http://www.bbc.co.uk/news/world-29334807#sa-ns_mchannel=rss&ns_source=PublicRSS20-sa</link>
      <guid isPermaLink="false">http://www.bbc.co.uk/news/world-29334807</guid>
      <pubDate>Wed, 24 Sep 2014 07:18:23 GMT</pubDate>
      <media:thumbnail width="66" height="49" url="http://news.bbcimg.co.uk/media/images/77782000/jpg/_77782318_77782068.jpg"/>
      <media:thumbnail width="144" height="81" url="http://news.bbcimg.co.uk/media/images/77782000/jpg/_77782319_77782068.jpg"/>
    </item>
    .....
  </channel>
</rss>
```

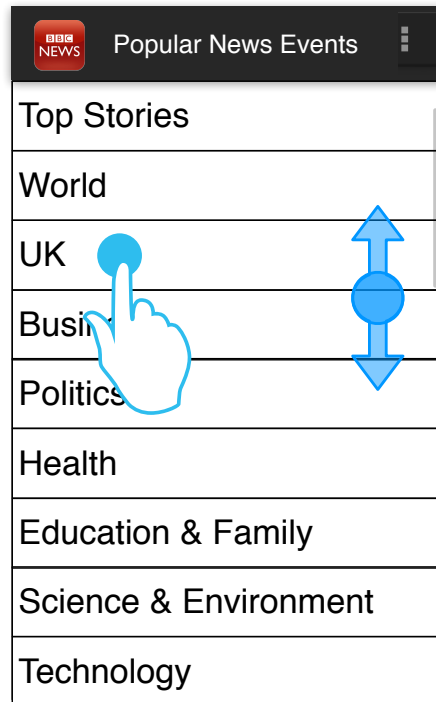
Figure 1, BBC News Feed in XML

### Important App Requirements:

Points will be deducted if your application does not follow the below requirements:

1. The required Android Virtual Device (AVD) should have **minimum SDK version set to 14 and target SDK at least 19**. The app should display correctly on Nexus 5. Your assignment will not be graded if it does not meet these requirements, and you will not be granted any points on your submission.
2. All API calls, XML parsing and image downloading should be performed using Threads (or AsyncTask) and your code should not block the main thread.
3. Your implementation should target the most efficient algorithms and data structures. You will be graded based on the efficiency of your implementation.

4. For this assignment you will be provided with a project folder which includes the activity initial implementations and UI. Import the provided project and add your implementation.



**Figure 2, Main Activity Wireframe**

### **Part A: Main Activity (10 Points)**

The launching activity is the Main Activity. Figure 1, shows the UI for the Main Activity. The activity displays a list of the news categories provided by BBC News feed website at <http://www.bbc.com/news/10628494> . The requirements are as follows:

1. The categories that should be included in the list are Top Stories, World, UK, Business, Politics, Health, Education & Family, Science & Environment, Technology, Entertainment & Arts. The list should be created using a simple ListView UI component.
2. Clicking on any category should start the “**NewsActivity**”, passing it only the url of the selected category.

### **Part B: News Activity (70 Points)**

News Activity should display brief news feed of the selected category. The url to the xml rss feed for the selected will be provided by the Main Activity (in the extras). Figure 2, shows a sample XML feed for the Science and Environment category. Each news item is included under the item element, which includes the news title, description, pubDate and many other fields. In addition, each news

item includes a thumbnail, under `media:thumbnail`, providing both a small and large thumbnail urls. The requirements are as follows:

**1. For the news' list retrieved from the stored Favorite:**

- a. Retrieve the list of favorite news from storage. You are free to use either **SQLite or Shared Preferences** to implement the required favorite storage and retrieval functionality. Note that the favorite storage should store all the news information required to display the news list as shown in Figure 3(b).
- b. The retrieved news' information should be displayed in a ListView as shown in Figure 3(b).

**2. For the news' list retrieved using the api:**

- a. The News activity is responsible for the loading the list of news items retrieved from the api or the list of favorite news items.
  - b. Display a Progress Dialog during the download and/or parsing of the XML and dismiss it once these operations are completed as indicated in Figure 3(a).
  - c. Use a thread pool (or AsyncTask) to communicate with the corresponding BBC api and to parse the result. Do not use the main threads to download the results. Care should be taken while parsing and should take into consideration the namespace.
  - d. Parse the XML stream using either a XMLPullParser or SAXParser and return the result to the News List.
  - e. For each news item retrieve the title, description, pubDate, thumbnailSmall and thumbnailLarge.
  - f. The retrieved apps' information should be displayed in a ListView as shown in Figure 2(b).
3. The news items should be displayed in a list, this list should be created using a customized ListView. Each item in the ListView should contain an ImageView and a TextView. See Figure 3(b).
4. In the new items list, for each news item display it's small thumbnail image and the news title. See Figure 3(b). A separate thread or AsyncTask should be used to retrieve the news thumbnail. You can use the Picasso library <http://square.github.io/picasso/> .
5. Menu Items (Sorting)
- a. Clicking the menu item "Sort By Title A-Z" should sort and redisplay the displayed news list in ascending order based on the title.
  - b. Clicking the menu item "Sort By Title Z-A" should sort and redisplay the displayed news list in descending order based on the title.
6. Menu Items (Favorites)
- a. Clicking the menu item "Clear Favorites" should clear all the stored news favorites. If the current list being displayed is the favorites list then it should be redisplayed to reflect clearing of the favorites.
  - b. Clicking the menu item "Show Favorites" should retrieve the new items from the local storage and redisplay the list to show the retrieved favorite news items.
7. The news item row should be clickable to provide the following functionality:
- a. Clicking a news item, should start the **DetailedNewsActivity** which provides more details about the current news item.

8. Note: In order to easily view the xml feed, you can download it as an RSS XML file and view it in Firefox browser or you can use the eclipse xml viewer.

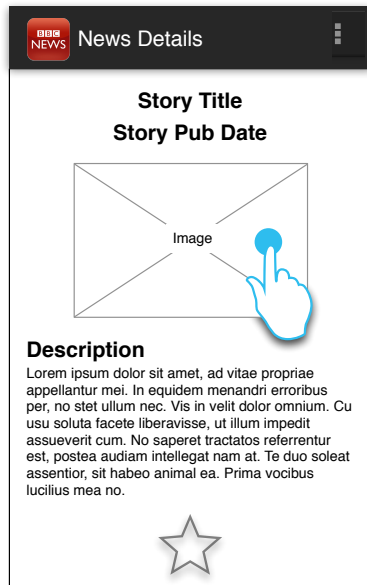


**Figure 3, News Activity Wireframe**

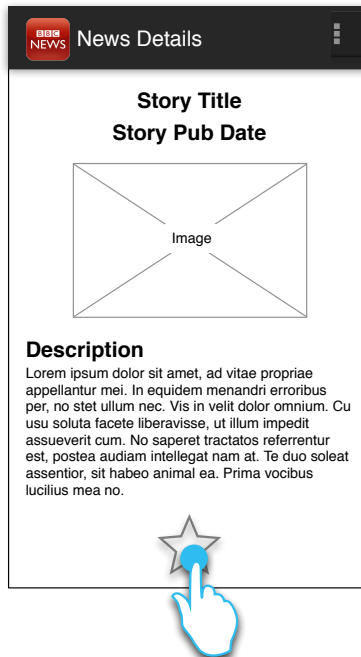
### **Part C: Detailed Activity (20 Points)**

Detailed Activity shows details about a selected news item. The user can view more details about the news and then return back to the list. The requirements are as follows:

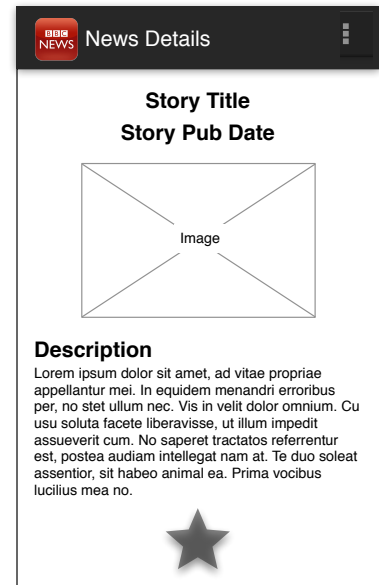
1. The activity's wireframe is shown in Figure 4. The news details should include the title, publication date, large image, and description. Pressing the back key should return to the News Activity.
2. The image should be retrieved using a background thread (Thread or AsyncTask).
3. The activity should also indicate if the loaded news item is either in the favorite list or not. If the news item is not in the favorites this should be indicated by using the icon in Figure 4(b) indicated by the white star, and if it is in the favorites it should be indicated using the icon in Figure 4(c) indicated by the grey star.
4. Clicking on the star not in favorites icon should add the current news item to the favorites and should change the icon to the in favorites icon. Similarly clicking the in favorites icon should remove the current news item from the favorites and should change the icon to the not in favorites icon. You can get these icons from the android icon pack available at [http://developer.android.com/downloads/design/Android\\_Design\\_Icons\\_20120814.zip](http://developer.android.com/downloads/design/Android_Design_Icons_20120814.zip)
5. Clicking the news image should show load the news item url in the local native browser.
6. Your code should handle the case, when the news activity is displaying the favorites list, and the news details activity is started. When returning back to the news activity the list should only be refreshed if the favorites information has changed.



(a) Loaded News Item



(b) Clicking on Favorites



(c) News Item in Favorites

**Figure 4, News Details Activity**