CS 442: Mobile Applications Development
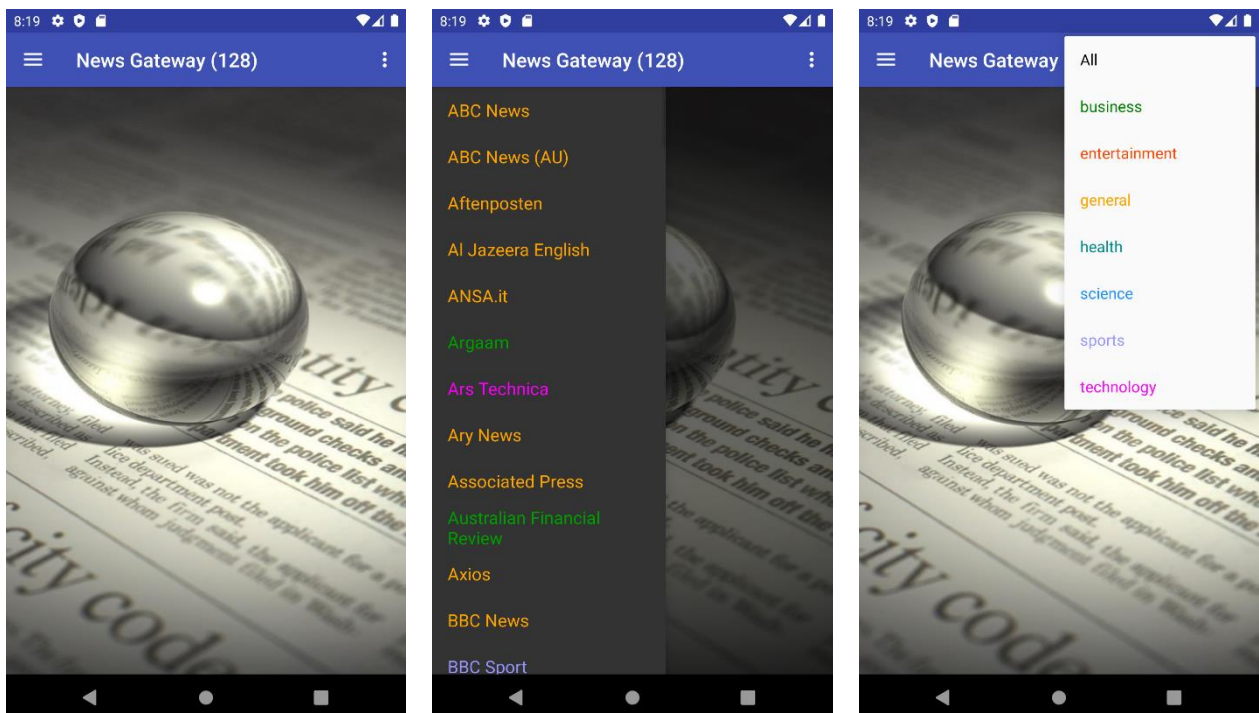
Assignment 5 – News Aggregator *(400 pts)*

Uses: Drawer Layout, ViewPager2, Adapters, Internet, APIs, Dynamic Menus, Implied Intents
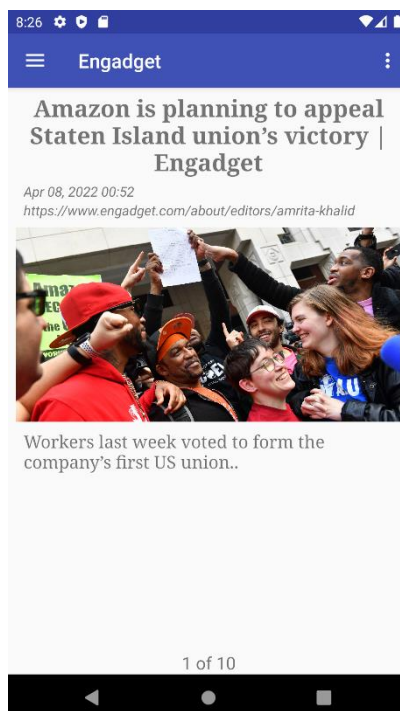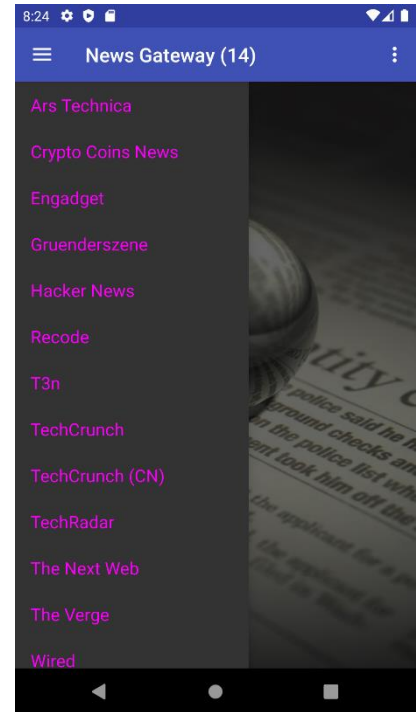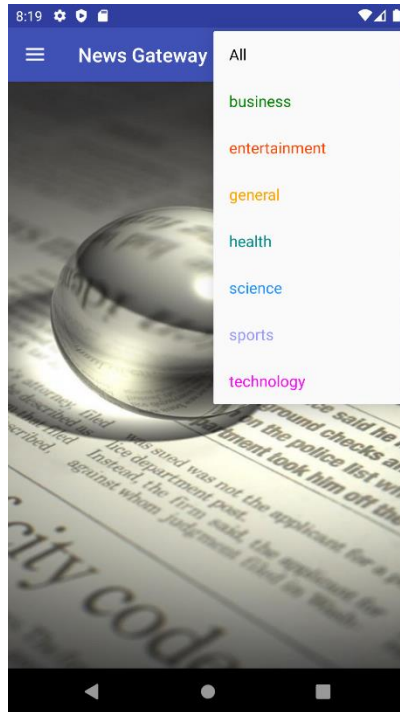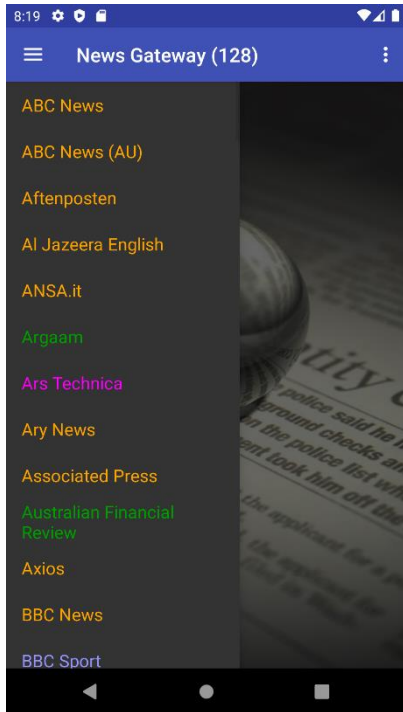
App Highlights:

- This app displays current news articles from a wide variety of news sources covering a range of news categories.

- NewsAPI.org will be used to acquire the news sources and news articles.

- Selecting a news source (i.e., CNN, Time, etc.) will display up to 10 top stories from that news source.

- Selecting a news topic will limit the news source choices to only those offering that topic of news.

- News articles are viewed by swiping right to read the next article, and left to go back to the previous article

- You will not need to develop separate landscape layouts.

- The user can go to the complete extended article on the news source's website by clicking on the article title, text, or image content.

- You must add a professional looking launcher icon to your app.

NO LATE SUBMISSIONS WILL BE ACCEPTED FOR THIS ASSIGNMENT – NO EXCEPTIONS
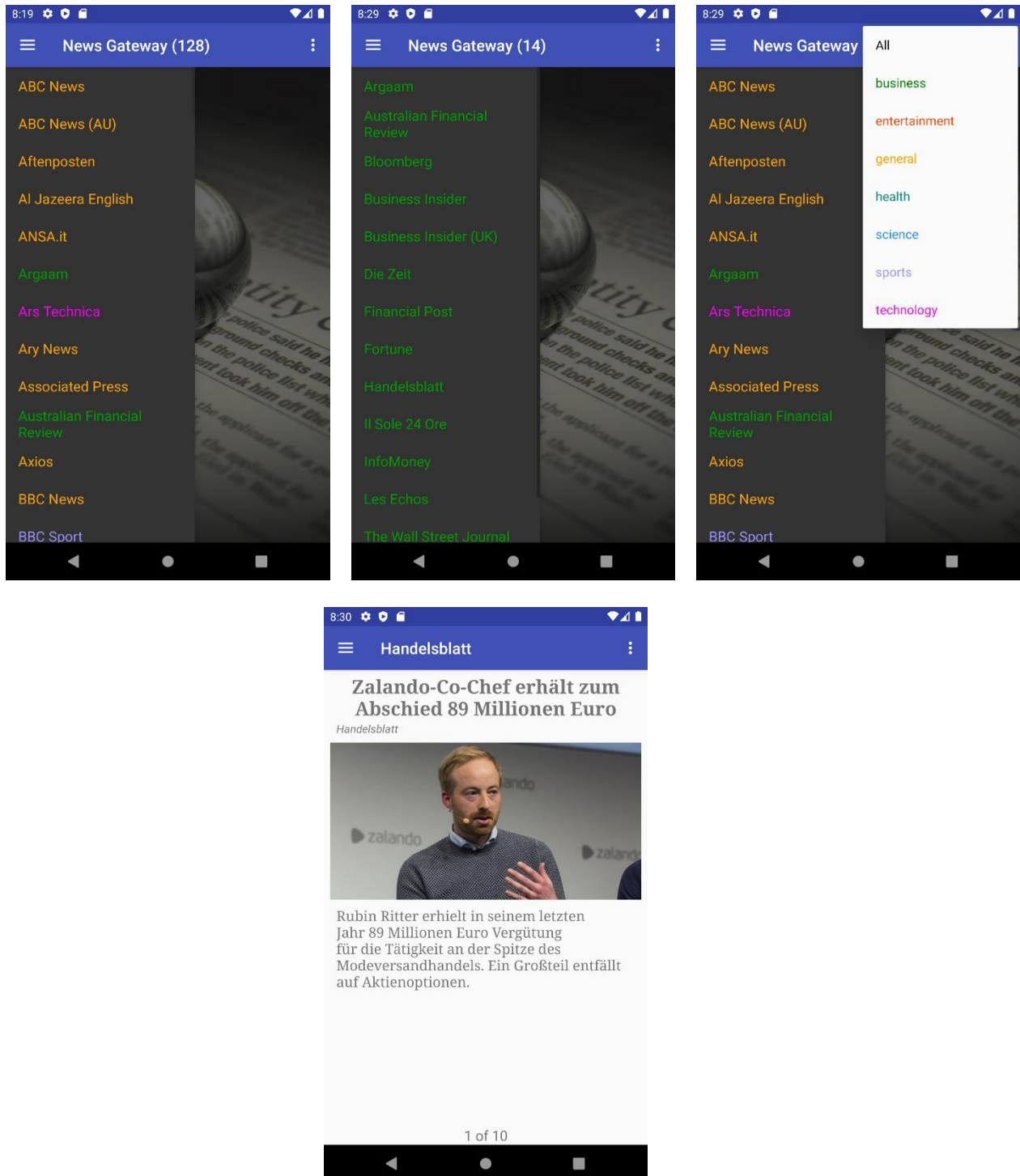
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Menu Behavior Examples:

- Filter News Sources by Topic (technology) – then view the news from source "Engadget":

- Filter News Sources by Topic (business) – then view the news from source "Handelsblatt":

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A) News Data:

Acquiring news source and news article data will be done via the NewsAPI.org news aggregation service. This service allows you to download news sources and news articles (by news source)

NOTE: You MUST sign up get an API key in order to access the NewsAPI.org services. Your API KEY must be supplied with NewsAPI.org queries. You can do this by registering at:

https://newsapi.org/register

Register with an email and a new password and agree to the terms and click Submit to register and get your API key (the key is displayed to you right after you click the Submit button).

The API:

The NewsAPI.org service offers 2 API calls – one to get news *sources* (organizations offering news – CNN, Time, etc.) and one to get top news articles from a selected news source.

1) News **Sources** Query Format (to be used in our assignment):

To get all sources: *https://newsapi.org/v2/sources?apiKey=_____*

For example, if your API Key was "ABC123xyz", the URL would be:

https://newsapi.org/v2/sources?apiKey=ABC123xyz

The News Source Query response is sent in JSON format (described in the next section).

2) News **Article** Query Format (to be used in our assignment):

To get top articles for a News Source: *https://newsapi.org/v2/top-headlines?sources=_____&apiKey=_____*

For example, if your API Key was "ABC123xyz" and you wanted "cnn" news, the URL would be:

https://newsapi.org/v2/top-headlines?sources=cnn&apiKey= ABC123xyz

The News Article Query response is sent in JSON format (described in the next section).

NOTE: This API requires the "User-Agent" request property be provided with your JsonObjectRequest objects. The value this property is set to does not matter, but it must be set. See the example below (red/bold is new):

```java
JsonObjectRequest jsonObjectRequest =
        new JsonObjectRequest(Request.Method.GET, url.toString(),
                null, listener, error) {
            @Override
            public Map<String, String> getHeaders() throws AuthFailureError {
                Map<String, String> headers = new HashMap<>();
                headers.put("User-Agent", "");
                return headers;
            }
        };
```

NewsAPI.org <u>Sources</u> Query Results Example:

https://newsapi.org/v2/sources?apiKey=<mark>ABC123xyz</mark>

The results come in the form of a JSON Object that contains a JSON Array of source entries as shown below. Each entry represents an individual news source (note that the "category" field is referred to as *Topic* in this application). Example:

```json
{
    "status": "ok",
    "sources": [
    {
        "id": "abc-news",
        "name": "ABC News",
        "description": "Your trusted source for breaking news, analysis, exclusive
                        interviews, headlines, and videos at ABCNews.com.",
        "url": "https://abcnews.go.com",
        "category": "general",
        "language": "en",
        "country": "us"
    }, {
        "id": "aftenposten",
        "name": "Aftenposten",
        "description": "Norges ledende nettavis med alltid oppdaterte nyheter innenfor
                        innenriks, utenriks, sport og kultur.",
        "url": "https://www.aftenposten.no",
        "category": "general",
        "language": "no",
        "country": "no"
    }, {
        "id": "argaam",
        "name": "Argaam",
        "description": "تداول السعودي الأسهم سوق متابعة في متخصص موقع ارقام -
                        البتروكيماويات ومنتجات واسعار لشركات معمقة تغطيه مع - تاسي
                        , الجديده الاكتتابات مالية تقارير",
        "url": "http://www.argaam.com",
        "category": "business",
        "language": "ar",
        "country": "sa"
    }, {
        . . .
        . . .
        . . .
    }]
}
```

NewsAPI.org Articles Query Results Example:

https://newsapi.org/v2/top-headlines?sources==cnn&apiKey= ABC123xyz

The results come in the form of a JSON Object that contains a JSON Array of article entries as shown below. Each entry represents an individual news article. Example:

```
{
    "status": "ok",
    "totalResults": 10,
    "articles": [{
            "source": {
                    "id":   "cnn",
                    "name"  "CNN"
            },
            "author":       "Kaitlan Collins, CNN",
            "title":        "Joe Biden: Sen. Joni Ernst just proved our point about Trump - CNN Video",
            "description": "Democratic candidate Joe Biden says Sen. Joni Ernst's (R-IA) comments
                            about the impeachment testimony impacting Biden's chances in the state
                            proves the real motivation behind Trump's attack on the former vice
                            president and his son.",
            "url":          "http://us.cnn.com/videos/politics/2020/01/28/joni-ernst-biden-iowa-
                            caucus-sot-ctn-sot-vpx.cnn",
            "urlToImage":   "https://cdn.cnn.com/cnnnext/dam/assets/200128022738-joe-biden-joni-
                            ernst-split-super-tease.jpg",
            "publishedAt": "2020-01-28T17:54:48.1249684Z",
            "content":      "Chat with us in Facebook Messenger. Find out what's happening in the
                            world as it unfolds."
    }, {
        . . .
        . . .
        . . .
    }
    }]
}
```

Note that any of the JSON fields can be skipped or specified as null in the JSON. Skipped or null fields should be removed from the display.

Missing or invalid image links should result in a default image displaying.

NOTE: This API requires the "User-Agent" request property be provided with your JsonObjectRequest objects. The value this property is set to does not matter, but it must be set. See the example below (red/bold is new):

```
JsonObjectRequest jsonObjectRequest =
        new JsonObjectRequest(Request.Method.GET, url.toString(),
                null, listener, error) {
            @Override
            public Map<String, String> getHeaders() throws AuthFailureError {
                Map<String, String> headers = new HashMap<>();
                headers.put("User-Agent", "");
                return headers;
            }
        };
```

B) Application Behavior Diagrams:

1) Startup

Topics can be selected using the options menu. The content displayed in this menu is dynamic – based upon the data retrieved from the news sources.
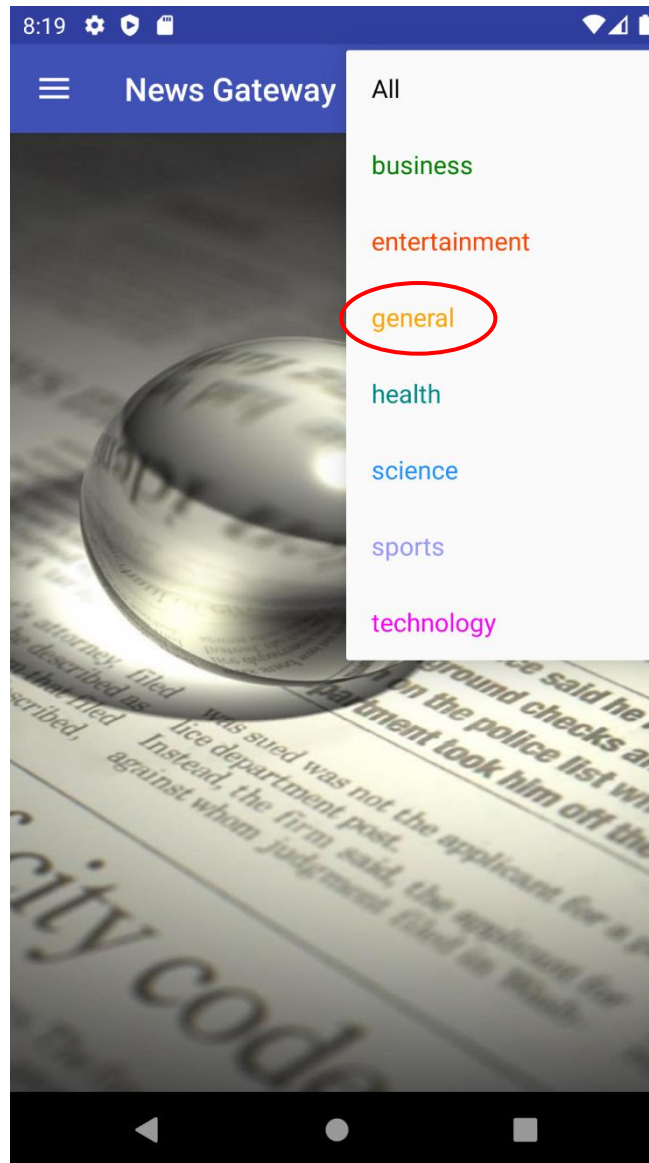

A News Source (i.e., "cnn") can be selected by opening the "drawer" and selecting a source

A news-related background is shown before any articles are loaded (you find a news-related background image for yourself)

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ASSIGNMENT – NO EXCEPTIONS

2) Selecting a Topic

Note that the content found in the options-menu is not hard-coded. The content comes from the data retrieved from the news sources.

For example, the unique list of all news topics from all sources in this example is *business, entertainment, general, health, science, sports, and technology*. Those topics are used to populate the "Topics" submenu (with the default "all" also added to the submenu). *Note that the unique set of topics changes over time and should NOT be hard-coded.*

Selecting a Topic will reduce the content of the News Sources drawer-list by eliminating those that do not match the specified Topic.
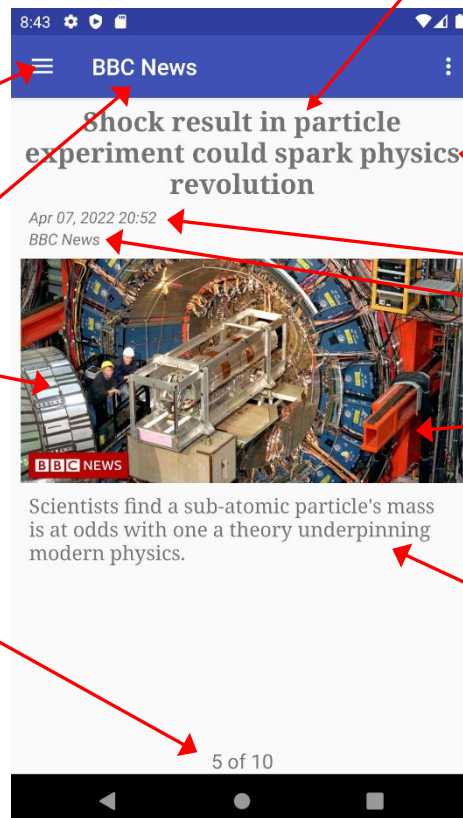
3) Selecting a News Source

Selecting a new source will refresh this display to show the first article of the new source.

The selected news source is displayed in the Navigation Bar

News articles from the selected source are displayed in a "view pager2" allowing left & right-swipe navigation between articles.

Article count is maintained at the bottom of the screen
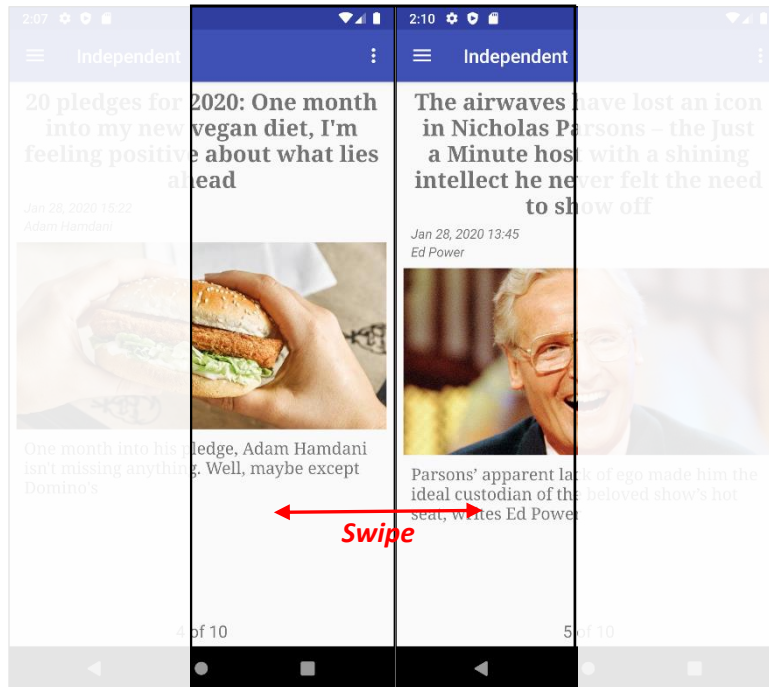
News Article Headline

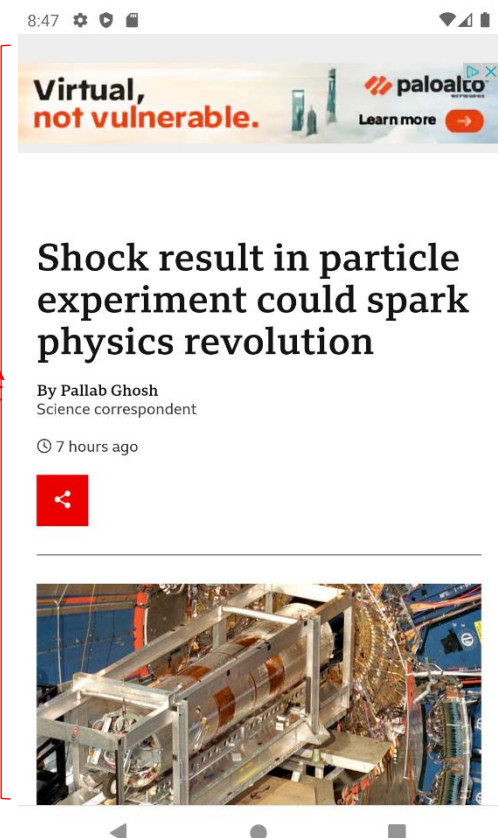*News Article Date*

News Article Author(s)

News Article Image

News Article Text - this needs to be scrollable so longer article text can be completely read.

4) Swipe Right (or Left) to scroll through articles from the selected new source:

5) Click on article title, image, or text to go to extended article on the news source web site

C) News Source Data Representation

The *full* news source list should always be stored as-is from the API, unchanged (nothing removed). Another "current" list of sources should be used to hold the "current" sources to be displayed in the drawer. This "current" list of sources will change based upon the Topic selections (is any). The list of current sources should contain all sources at startup (as no topic has been selected).

When a criteria selection is made (i.e., the "business" topic), the "current" source list should be updated to contain only the sources that have "business" as the topic. This is shown below:

Full List		Current List
Source 1		Source 1
Source 2	*Select*	Source 2
Source 3	*Topic*	Source 3
Source 4		Source 4
…		**…**
Source 100		***Source 48***

D) Provided Resources *(3 images, 2 JSON files)*
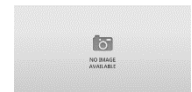
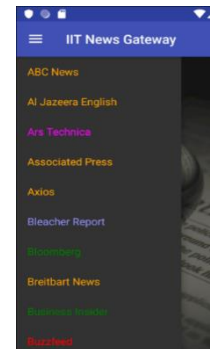Image Error   Loading Placeholder   No Image (i.e., *null*)

E) Extra Credit:

1) News article date/time stamps are in the format "2020-04-08T17:54:48.12…Z" (this is called "zero hour offset" also known as "Zulu time"). Earn 15 points if you convert this to the following format: "Apr 08, 2022 20:52".

2) Up to 20 points of extra credit will be awarded if you save and restore the app state when transitioning between portrait and landscape layouts to ensure a smooth user experience. Without this, the app reverts to the start state upon rotation. If this is done properly, the current topic selection, the current source list (in the drawer), and the displayed articles will be maintained upon device orientation change.

3) Up to 25 points of extra credit will be awarded if you display the news topics in the options menu different colors, and then color the news sources in the drawer according to their topic:

Assignment Assistance

The TAs for our course are available to assist you with your assignment if needed. Questions on assignment requirements and course concepts can be sent to the instructor.

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Submissions & Grading

1) Submissions must consist of your zipped project folder *(please execute Build =>Clean Project before generating the zip file)*.

2) Submissions should reflect the concepts and practices we cover in class, and the requirements specified in this document.

3) **NO LATE SUBMISSIONS WILL BE ACCEPTED FOR THIS ASSIGNMENT – NO EXCEPTIONS**

4) Grading will be based upon the presence and proper functionality of *all features and behaviors* described in this document. NOTE: All descriptions and images constitute the requirements for this assignment.

5) Grading will be performed with the following SDK details:
   o Project Compile & Target SDK Version: 30
   o Project Minimum SDK Version: 25

6) Grading will be performed on emulator devices with the following characteristics:

Resolution	Details	Example Emulators
1080 x 1920	With Playstore	Pixel, Pixel 2, Nexus 5, Nexus 5X
1080 x 2220 or 2280	With Playstore	Pixel 3a, Pixel 4

If you do not understand anything in this handout, please ask.

Otherwise the assumption is that you understand the content.

Unsure? Ask!

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