Project 4 - National Park App

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Description

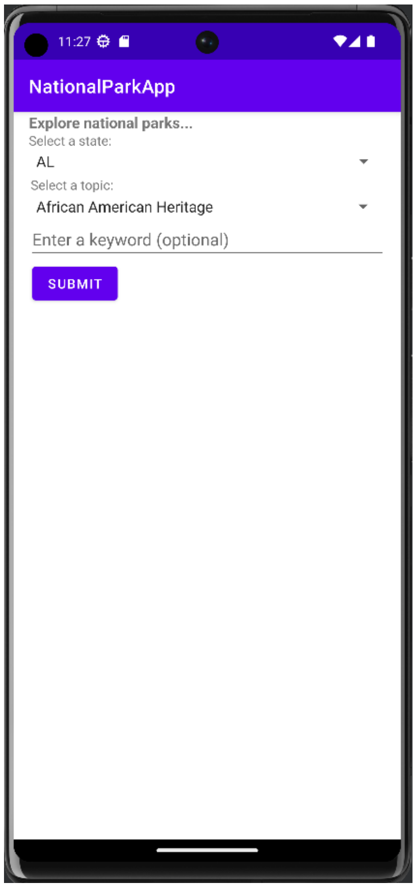
My application takes the selected state, topic, and optional query from the user and uses them to fetch and display information about national parks from the National Park Service.

Here is how my application meets the task requirements:

1. **Implement a native Android application**
    a. Has at least three different kinds of views in your Layout (TextView, EditText, ImageView, etc.)

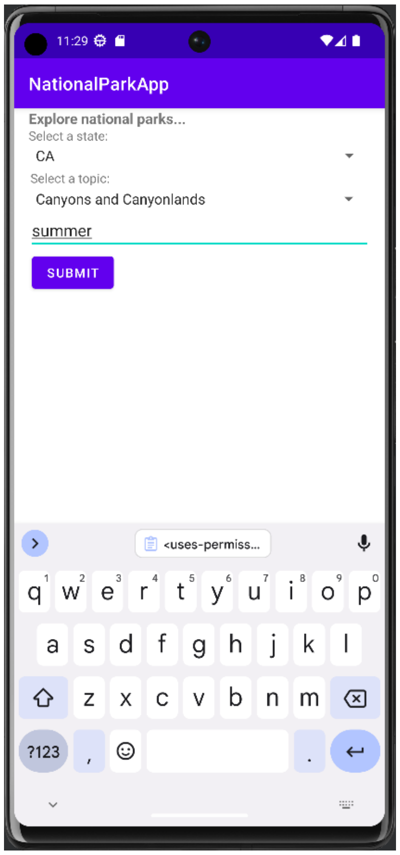
    My application uses TextView, Spinner, EditText, Button, ListView, and ImageView. See content_main.xml and activity_park_list_view.xml for details of how they are incorporated into the ConstraintLayout and RelativeLayout.

    Here is a screenshot of the layout before any selection or input has been made by the user.


11:27
NationalParkApp
Explore national parks...
Select a state:
AL
Select a topic:
African American Heritage
Enter a keyword (optional)
SUBMIT

b. **Requires input from the user**

Here is a screenshot of the user searching for information of national parks in CA featuring topic “Canyons and Canyonlands” with keyword “summer.



c. **Makes an HTTP request (using an appropriate HTTP method) to your web service**

My application does three HTTP GET requests:

i. Get the state and topic list for user selection in GetDropdownInfo.java. “https://ddcode112-automatic-capybara-x6xx6gjq65r3wpp-8080.preview.app.github.dev/getTopics” “https://ddcode112-automatic-capybara-x6xx6gjq65r3wpp-8080.preview.app.github.dev/getStates” The get method makes these two requests of my web application, parses the returned JSON to ArrayLists, and returns.

ii. Search for information about national parks in GetParkInfo.java. "https://ddcode112-automatic-capybara-x6xx6gjq65r3wpp-8080.preview.app.github.dev/NationalPark?"+ "topic=" + topic + "&stateCode=" + state + "&q=" + q
The variables, topic and state, represent the topic and state the user selects from the two dropdown lists, and the variable, q, represents the

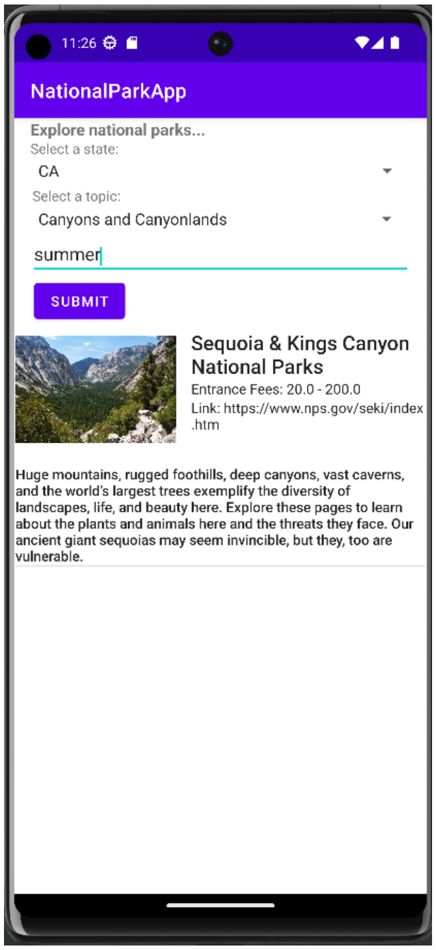
keyword the user enters.
The search method makes this request of my web application, parses the returned JSON to ParkInfo objects, fetches the picture using the image url to bit image for each object, and returns an ArrayList of ParkInfo objects storing the information of each national park.

d. **Receives and parses an XML or JSON formatted reply from the web service**

An example of the JSON reply is:
[{"img":"https://www.nps.gov/common/uploads/structured_data/3C7A250B-1DD8-B71B-0BCF61A89A8B2970.jpg","maxEntranceFee":200,"fullName":"Sequoia & Kings Canyon National Parks","description":"Huge mountains, rugged foothills, deep canyons, vast caverns, and the world\u2019s largest trees exemplify the diversity of landscapes, life, and beauty here. Explore these pages to learn about the plants and animals here and the threats they face. Our ancient giant sequoias may seem invincible, but they, too are vulnerable.","minEntranceFee":20,"url":"https://www.nps.gov/seki/index.htm"}]

e. **Displays new information to the user**

Here is the screenshot after the information has been returned.

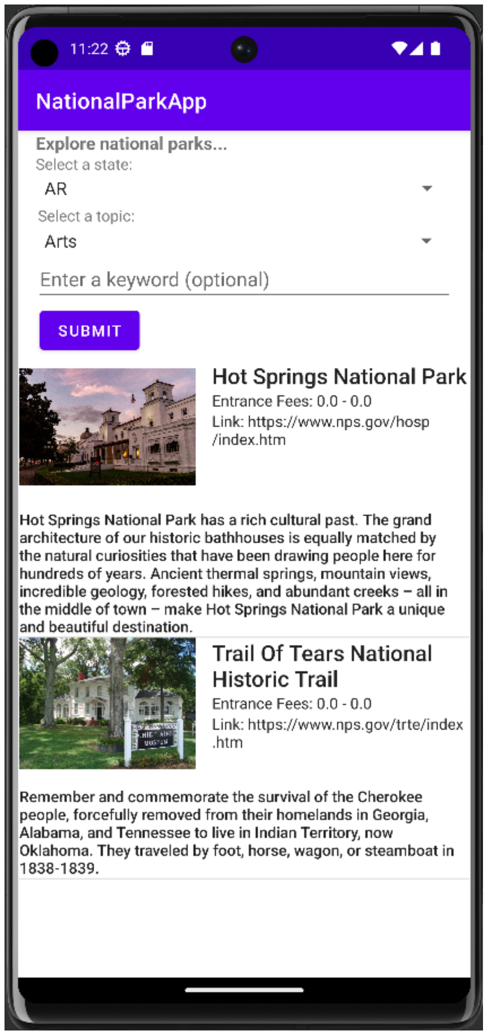


Sequoia & Kings Canyon National Parks
Entrance Fees: 20.0 - 200.0
Link: https://www.nps.gov/seki/index.htm

Huge mountains, rugged foothills, deep canyons, vast caverns, and the world's largest trees exemplify the diversity of landscapes, life, and beauty here. Explore these pages to learn about the plants and animals here and the threats they face. Our ancient giant sequoias may seem invincible, but they, too are vulnerable.

f. **Is repeatable (I.e. the user can repeatedly reuse the application without restarting it.)**

The user can change the search terms and hit Submit. Here is an example of selecting state “AR” and topic “Arts” without keywords.



Hot Springs National Park
Entrance Fees: 0.0 - 0.0
Link: https://www.nps.gov/hosp/index.htm

Hot Springs National Park has a rich cultural past. The grand architecture of our historic bathhouses is equally matched by the natural curiosities that have been drawing people here for hundreds of years. Ancient thermal springs, mountain views, incredible geology, forested hikes, and abundant creeks – all in the middle of town – make Hot Springs National Park a unique and beautiful destination.

Trail Of Tears National Historic Trail
Entrance Fees: 0.0 - 0.0
Link: https://www.nps.gov/trte/index.htm

Remember and commemorate the survival of the Cherokee people, forcefully removed from their homelands in Georgia, Alabama, and Tennessee to live in Indian Territory, now Oklahoma. They traveled by foot, horse, wagon, or steamboat in 1838-1839.

2. **Implement a web application, deployed to Codespace**

The URL of my web service deployed to Codespace is:
https://ddcode112-automatic-capybara-x6xx6gjq65r3wpp-8080.preview.app.github.dev/

a. Using an HttpServlet to implement a simple (can be a single path) API

In my web project:
Model: NationalParkModel.java
View: states.jsp, topics.jsp, result.jsp
Controller: NationalParkServlet.java

b. **Receives an HTTP request from the native Android application**

   NationalParkServlet.java receives the HTTP GET requests

   i. /getStates: gets the list of states from the model.
   ii. /getTopics: gets the list of topics from the model.
   iii. /NationalPark: with the arguments topic, stateCode, and q, and passes them to the model to search.

c. **Executes business logic appropriate to your application**

   NationalParkModel makes HTTP requests to:

   i. https://developer.nps.gov/api/v1/topics?&api_key=<my_api_key>
      To set the topic name to id mapping.
   ii. https://developer.nps.gov/api/v1/topics/parks?id=<topicId>&api_key=<my_api_key>
      When the user submits search request, parses the JSON response and extracts all parkCodes of the parks with the topicId in the state the user selects into a string parkList.
   iii. https://developer.nps.gov/api/v1/parks?parkCode=<parkList>&q=<q>&api_key=<my_api_key>
      With the parkList returned from the last step, requests information about the parks, parses the JSON response, and extracts the parts it needs to respond to the Android application.

   Lastly, writes the record to MongoDB.

d. **Replies to the Android application with an XML or JSON formatted response**

   The servlet directly responses JSON formatted strings.

   i. states.jsp
      `<%= request.getAttribute("stateList")%>`
   ii. topics.jsp
      `<%= request.getAttribute("topicList")%>`
   iii. result.jsp
      `<%= request.getAttribute("parkInfoArray")%>`

3. **Log useful information**

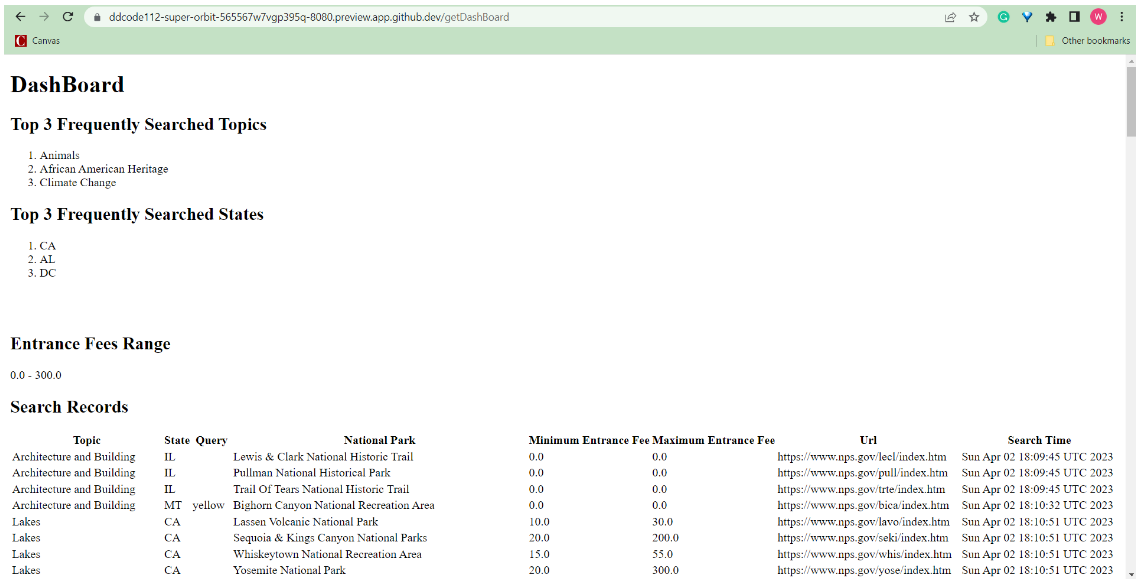
   From user inputs: topic, state, query
   From responses: name of national parks, min/max entrance fees, url
   Other: search timestamp

   With the information, the user will be able to check the information about the parks in line with the search terms. The timestamp can also help the user find the log more easily.

4. **Store the log information in a database**

   mongodb://wantienc:b03106027@ac-wnxakuz-shard-00-01.2ipcl1k.mongodb.net:27017,ac-wnxakuz-shard-00-00.2ipcl1k.mongodb.net:27017,ac-wnxakuz-shard-00-02.2ipcl1k.mongodb.net:27017/test?w=majority&retryWrites=true&tls=true&authMechanism=SCRAM-SHA-1

5. **Display operations analytics and full logs on a web-based dashboard**



ddcode112-super-orbit-565567w7vgp395q-8080.preview.app.github.dev/getDashBoard
Canvas
Other bookmarks

DashBoard

Top 3 Frequently Searched Topics

1. Animals
2. African American Heritage
3. Climate Change

Top 3 Frequently Searched States

1. CA
2. AL
3. DC

Entrance Fees Range

0.0 - 300.0

Search Records

Topic	State	Query	National Park	Minimum Entrance Fee	Maximum Entrance Fee	Url	Search Time
Architecture and Building	IL		Lewis & Clark National Historic Trail	0.0	0.0	https://www.nps.gov/lecl/index.htm	Sun Apr 02 18:09:45 UTC 2023
Architecture and Building	IL		Pullman National Historical Park	0.0	0.0	https://www.nps.gov/pull/index.htm	Sun Apr 02 18:09:45 UTC 2023
Architecture and Building	IL		Trail Of Tears National Historic Trail	0.0	0.0	https://www.nps.gov/trte/index.htm	Sun Apr 02 18:09:45 UTC 2023
Architecture and Building	MT	yellow	Bighorn Canyon National Recreation Area	0.0	0.0	https://www.nps.gov/bica/index.htm	Sun Apr 02 18:10:32 UTC 2023
Lakes	CA		Lassen Volcanic National Park	10.0	30.0	https://www.nps.gov/lavo/index.htm	Sun Apr 02 18:10:51 UTC 2023
Lakes	CA		Sequoia & Kings Canyon National Parks	20.0	200.0	https://www.nps.gov/seki/index.htm	Sun Apr 02 18:10:51 UTC 2023
Lakes	CA		Whiskeytown National Recreation Area	15.0	55.0	https://www.nps.gov/whis/index.htm	Sun Apr 02 18:10:51 UTC 2023
Lakes	CA		Yosemite National Park	20.0	300.0	https://www.nps.gov/yose/index.htm	Sun Apr 02 18:10:51 UTC 2023