Topic 2

1. **Title:** *Empowering Geospatial Exploration: An Innovative Online Processing Platform with Natural Language Scripting Capabilities*

2. **Description**: The geospatial online processing platform with custom scripting capabilities revolutionizes the way users interact with spatial data. By integrating natural language queries (both audio and text), this platform aims to simplify and enhance geospatial exploration, allowing users to derive valuable insights through a user-friendly and efficient interface. This application should be able to query admin boundaries, themes and must also incorporate various conditional statements.

3. **Objectives**:
   a. Create a user-friendly geospatial platform that accepts natural language queries (both audio and text) for tasks like mapping, analysis, and data extraction.
   b. Implement custom scripting capabilities to empower users with automation and advanced geospatial workflows.
   c. Foster innovation in geospatial technology by promoting user-driven development.

4. **Expected Outcomes:**
   a. A functional geospatial online processing platform with natural language query support.
   b. The system should furnish information pertaining to administrative boundaries, geographic locations, thematic layers, and additional layers. It should also support conditional statements, such as specifying areas with forest cover greater than a certain threshold.
   c. Increased accessibility and usability of geospatial data and tools for a broader audience.

5. **Relevant data and steps to get the data from Bhuvan/ other sources:**
   a. Participants can access geospatial data from Bhuvan (or other sources) via APIs or download datasets.
   b. Data may include satellite imagery, terrain data, thematic data, geospatial features, and more.

6. **Steps to be followed for achieving the objectives:**
   a. Develop a user interface that accepts natural language queries and translates them into geospatial commands using Python (or any other language).
   b. a robust NLP system that can interpret both audio and text-based natural language queries. This system should be trained to understand geospatial terms and concepts.
   c. Data for NLP system can be taken from Bhuvan Thematic services or data from Bhuvan store or from any other open-source API.
   d. Finally, the output from NLP must be visualized on the map based on user queries.
   e. Test and refine the platform to ensure user-friendliness and reliability.

7. **Evaluation:**
   a. **Functionality:** The ability of the platform to execute geospatial tasks based on natural language queries (in audio and text). The functionality of the online processing platform will be assessed in terms of its ability to integrate data, process natural language queries (both audio and text), and execute scripting capabilities. It should effectively support queries related to admin boundaries, thematic layers, and conditional statements related to all layers.

b. **Natural Language Processing (NLP) Accuracy:** Examining the accuracy of the NLP system in interpreting both audio and text-based queries related to geospatial data. Evaluating its ability to understand geospatial terms and concepts accurately. The confusion matrix, precision and recall values and other hyper parameters will be taken into consideration along with the architecture of the system.

c. **Conditional Statements Implementation**: Verifying the implementation of the conditional statements module, ensuring that users can effectively specify criteria and conditions for querying geospatial data. Check for flexibility and accuracy in handling various conditions.

d. **User Experience:** The user-friendliness of the interface and the ease of interaction with the platform. The Net Promoter Score (NPS) and the System Usability Scale (SUS) are used to assess user satisfaction and the overall user experience.

e. **Innovation:** The uniqueness and creativity of the solution, including novel features and approaches. This will be evaluated based on uniqueness in the architecture, usage of novel technological approaches.

f. **Performance:** The speed and efficiency of geospatial operations and query processing. This will be evaluated based on Query Response time, throughput, time/space complexity of the algorithm used, concurrency handling, scalability, error rates, caching effectiveness, and data loading speed.

g. **Documentation and Presentation:** Clear documentation, code quality, and presentation during the hackathon event.