AI for Climate Change
Laboratory 3

Data Acquisition and Preparation

- **LANDSAT 8 Acquisition:** LANDSAT 8 satellite images were acquired using the `preprocess_data` script.
- **Training Data Definition:**
  - Training points were defined by merging "snow" and "no_snow" data
  - "no_snow" FeatureCollection has 20 elements
  - "snow" FeatureCollection has 30 elements
- **Feature Extraction:** Training features were extracted by manually picking each point on the map.

Snow Classification Model Training

- **Support Vector Machine (SVM) Classifier:**
  - A Support Vector Machine (SVM) classifier was defined and trained using the prepared training data.
  - The following spectral bands from the LANDSAT 8 images were used as input properties for the SVM classifier: 'Blue', 'Green', 'Red', 'NIR', 'SWIR1', 'SWIR2', and 'NSI'.

Model Evaluation

- **SVM Classifier Performance:** The trained SVM classifier's performance was evaluated using a confusion matrix and accuracy metric.

Confusion Matrix:

Training Set			
TARGET / OUTPUT	Class0	Class1	SUM
Class0	17 / 36.17%	3 / 6.38%	20 / 85.00% / 15.00%
Class1	8 / 17.02%	19 / 40.43%	27 / 70.37% / 29.63%
SUM	25 / 68.00% / 32.00%	22 / 86.36% / 13.64%	36 / 47 / 76.60% / 23.40%

  - **Accuracy:** 0.766

4. Snow Cover Classification and Visualization

- **Image Classification:** The LANDSAT 2015 image was classified using the trained SVM classifier to identify snow-covered areas.
- **Visualization:** The classified snow image was added to the map, using a red/blue color palette to represent the classification results. Blue represents ice/snow and red the opposite (watter, land, etc.)