# Agenda

* Seg 4 - Links are sent, pictures are parked.

# Website contents- review, changes, edits, content

* + News scrape? Feed

Graphical user interface, text, application

Description automatically generated

* + Content? This is cut <https://nsidc.org/arcticseaicenews/2022/02/arctic-sea-ice-this-january-so-last-decade/>
  + A picture containing timeline

    Description automatically generated
  + Statistics off our data? 2100? Even if we significantly curb emissions in the coming decades, more than a third of the world’s remaining glaciers will melt before the year 2100. When it comes to sea ice, 95% of the oldest and thickest ice in the Arctic is already gone.

Text

Description automatically generated

# Presentation

* + Go thru speaking notes
  + Icebreaker – camera on

# Speaking Order & Topic

* 1min – Leslie—Highlights/ Impacts / Significance
* 2min – Aryam --Data Exploration / Gathering / ETL
* 2min – Amber – Machine Learning
* 2min – Leo – Website Developing
* 1min – Leslie - Highlights/ Impacts / Significance
* 2min – Q & A

# Speaking Pattern

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Key Points | 120 words/min Slow- | 160 words | 200/min words Fast |
| Leslie |  |  |  | 200 words |
| Aryam |  |  | 160+160=320 |  |
| Amber |  |  |  | 200+200=400 |
| Leo |  | 120+120=240 |  |  |
| Leslie |  |  |  | 200 words |
| Q&A |  |  | 160+160=320 |  |
| **1680** |  | 240 | 640 | 800 |

If you are a slow speaker, less than 120

If you speak at an average speed between: 120 - 160 words.

If you are a fast speaker between: 160 - 200 words.

* 1min – Leslie
* 2min – Aryam
* 2min – Amber
* 2min – Leo
* 1min – Leslie
* 2min – Q & A

Speech

1680 words

|  |  |
| --- | --- |
|  | Demonstrates the interactivity of the dashboard in real time |
| Leslie  (160 words) | Welcome to ALYAGroup 2 project overview on Climate Change. This Project takes scientific data features as it pertains to melting of Artic Sea Ice.  The Artic is located in the northpole and the sea ice up there is melting faster than the glaciers in the southpole where Antarctica in located.  We are taking action on climate change by creating a model that integrates with scientific data features thru API and runs algorithms to predict a future value of those features then we display the significant features interactively on our website.    Do you want to know when this catastrophic event will happen?  Our scope is to extract, transform, and load big science data into cloud analytics, and use machine learning time-series model to forecast the future features datapoints.  What we are monitoring are variables that fluctuate over time and specifically has a moving average due to seasonality.  Our model was successful, and the future application is the flexibility to use this model on any features as desired as it pertains to the average sea ice extent melting.  (160 Word) |
|  | Demonstrates the interactivity of the dashboard in real time |
| Aryam | Description of data preprocessing, feature engineering and the feature selection, including the decision-making process, Database stores static data for use during the project, Database interfaces with the project in some format (e.g., scraping updates the database)  All of our data arrives from daily scientific measuring units variables and measurement tools in the filed of Sciences with technologies in Satalite and tracking tools. Based on research for Melting Sea Ice Features, we discovered the following trends in the sea ice extent size between 1978 and 2021: |
|  | Slides |
| Amber | Description of how data was split into training and testing sets  \* Explanation of model choice, including limitations and benefits:  Given the nature of the data and the question we are trying to answer, we used a Timer-Series prediction model **SARIMAX** (Seasonal Auto-Regressive Integrated Moving Average with eXogenous factors). It helps to predict future values using auto-regression and moving average along with adding in the seasonality factor.  ~~\* Explanation of changes in model choice~~  \* Description of how the model was trained   * Data pre-processing included importing the dataset using SQLAlchemy from AWS, dropping unwanted columns and setting the date as index. Data was also scaled using MinMax Scaler from the Scikit library. * Data was split into training and testing sets using a 70-30 ratio and using the scikit library. * Decomposed time-series into several components – trend, seasonality, random noise. Checked for Data Stationarity using Augmented Dickey-Fuller(ADF) test. If we make the data stationary, then the model can make predictions based on the fact that mean and variance will remain the same in the future. A stationarized series is easier to predict. For data points that were not stationary, data was differenced to make it stationary. ---An ACF and PACF bar chart was plotted. ACF is a plot of the coefficients of correlation between a time series and its lag and helps determine the value of p or the AR term while PACF is a plot of the partial correlation coefficients between the series and lags of itself and helps determine the value of q or the MA term. Both p and q are required input parameters for the SARIMAX Model. * Using the pyramid and statsmodel libraries, Ran the SARIMAX model to forecast the extent based on the order obtained using ARIMA model and using the training set as the exogenous variables - Fitted the model and trained and tested data was put into a dataframe (converted back to scale). The RSME was 0.08529, which represents a very good accuracy score. * Fitted the model and trained and tested data was put into a dataframe (converted back to scale). The RSME was 0.08529, which represents a very good accuracy score.   **Machine Learning - Forecasting**   * After using the SARIMAX model to train the model and get a high accuracy square, we attempted to forecast the sea ice extent in the future. In order to do that: * A univariate time-series model was applied to each of the features to estimate their future value, which are put into a dataframe * using the predicted values of the features, we used the model to predict the values of Y (Extent):   Description and explanation of model's confusion matrix, including final accuracy score   * Result of the analysis   \* Recommendation for future analysis  \* Anything the team would have done differently |
|  |  |
| Leo | Using JavaScript and APIs to display google earth map  1. Using" beautiful soup" and "splinter" to scrap the news from idc website.  2. We put the scraping script in the "Google app engine Cron task" and it will automatically do the scraping everyday.  3. Store the data into MongoDB.  4. Deploy the web page to "Google app engine".  5. The website is using "Flask" and "pymongo" to show and read the data from MongoDB. |
|  |  |
| Leslie | For this Project on Climate Change- Our group developed a monitoring and forecasting, algorithm, website station. Clients of interest are scientist wanting to show case seasonal data and environmental disaster planning components of Climate Change monitoring. The limitations of a univariate time-series model is a potential streghth for our business model, because we have capability to independently exchange features of the data, scientist change variables over time, and the scope is vast to include different datasets to predict the future events.  What happens next for sea Ice melting, has serious consequences. As sea ice and glaciers melt and oceans warm, ocean currents will continue to disrupt weather patterns worldwide. Industries that used to thrive will be affected as warmer waters change the ecosystem. Communities will continue to face billion-dollar disaster recovery bills as flooding becomes more frequent and storms become more intense.  “Lets remember we are floating on a rock, thru outer space in an ecosystem built to sustain itself” lets start making wiser choices now.  Arctic Sea Ice continues to melt it could be ice free in the summer as soon as the year 2040. When it comes to sea ice, 95% of the oldest and thickest ice in the Arctic is already gone. Today, the Arctic is warming twice as fast as anywhere on earth, and the sea ice there is declining by more than 10% every 10 years.  Your impact on climate change primarily comes from: what you eat, how you power your homes and mobile devices, and how you travel from place to place.  Food  I will set a goal of reducing the food waste in my home from its current levels.  I commit to only buying what I need and eat what I buy!  Electricity  I will check out solar panels or look into community solar projects in my area  I will look into options to switch to renewable energy from my utilities company.  Transportation  I commit to reducing the fossil fuel impact of my daily commute to work or school by walking, riding my bike, carpooling, or using public transportation one or more days per week. |
| Questions? | Question 1  Question 2  Question 3  Question 4 |

<https://www.publicationcoach.com/ten-ways-to-write-a-better-speech/>

<https://www.worldwildlife.org/pages/why-are-glaciers-and-sea-ice-melting>

<https://www.severe-weather.eu/global-weather/polar-vortex-2022-rapid-intensification-bomb-cyclone-iceland-snow-mk/>

Presentation Day

Arrive at 6:15 and wait in lobby until 6:30 open.