Group Presentation

Group 22

MAST90016 Data Science Project 1
The University of Melbourne

May 28, 2021

Overview

Project

- Topic:
  - Investigate the relationship between climate events and corporate financial performance
- Background:
  - Climate events impact the financial markets
  - Limited discussions and researches

Host Organisation

- Lensell
  - AI-powered platform
  - Helps Australian companies on the financial markets
  - Helps investors and analysts access performance data
- Founder of Lensell: Dr Laura
  - Fintech CEO
  - Passion researcher
  - Publisher author

Group Members

Group Member	Role	Task Allocation
Andrew Stringer	Team Leader	Modelling investigation; Comprehensive literature review
Chao Jia	Lead Researcher	Financial data processing, Literature review
Xin Wei	Industry Partner Contact	Data crawling; Climate data processing; Literature review
Wei Li	Project Manager	Data crawling; Correlation analysis; Literature review

1 Introduction

2 Literature Findings
- Data
- Correlation Analysis and Modelling

3 Preliminary Analysis

4 Future Plan

Data

- Natural disaster data
  - previous work reduce to binary 0 or 1
  - insufficient for yearly data
  - extent of damages available to us
- CFP measures
  - accounting-based measures — available for all companies, only yearly data
  - relative measures (e.g. ROA) allows reliable comparisons across companies within same industry
  - recent tendency to use multiple CFP measures

Correlation Analysis and Modelling

- Correlation analysis
  - Pearson (linear)
  - Spearman, Kendall (monotonic)
  - mutual information, cross-entropy (non-linear)
- Modelling temperature impacts
  - quantile regression allows for some companies to be impacted even if not all are
- Modelling natural disaster impacts
  - GARCH, ARMA models have been used
  - historical dependence encoded in model
  - we plan to extend to indirect impacts by using wait times

Methodology

- Aims: explain and understand the relationship
- Methods:
  - Correlation analysis;
  - Regression analysis;
  - Time series analysis.
- Evaluation: p-value, R-squared

Correlation Analysis

- Correlation Coefficient: Pearson, Spearman, Kendall
- Variables:
  - ROA (return on assets)
  - Temperature difference
  - Bushfire burnt areas
- Relationship:
  - ROA and temperature difference;
  - ROA difference and temperature difference;
  - ROA and bushfire burnt areas

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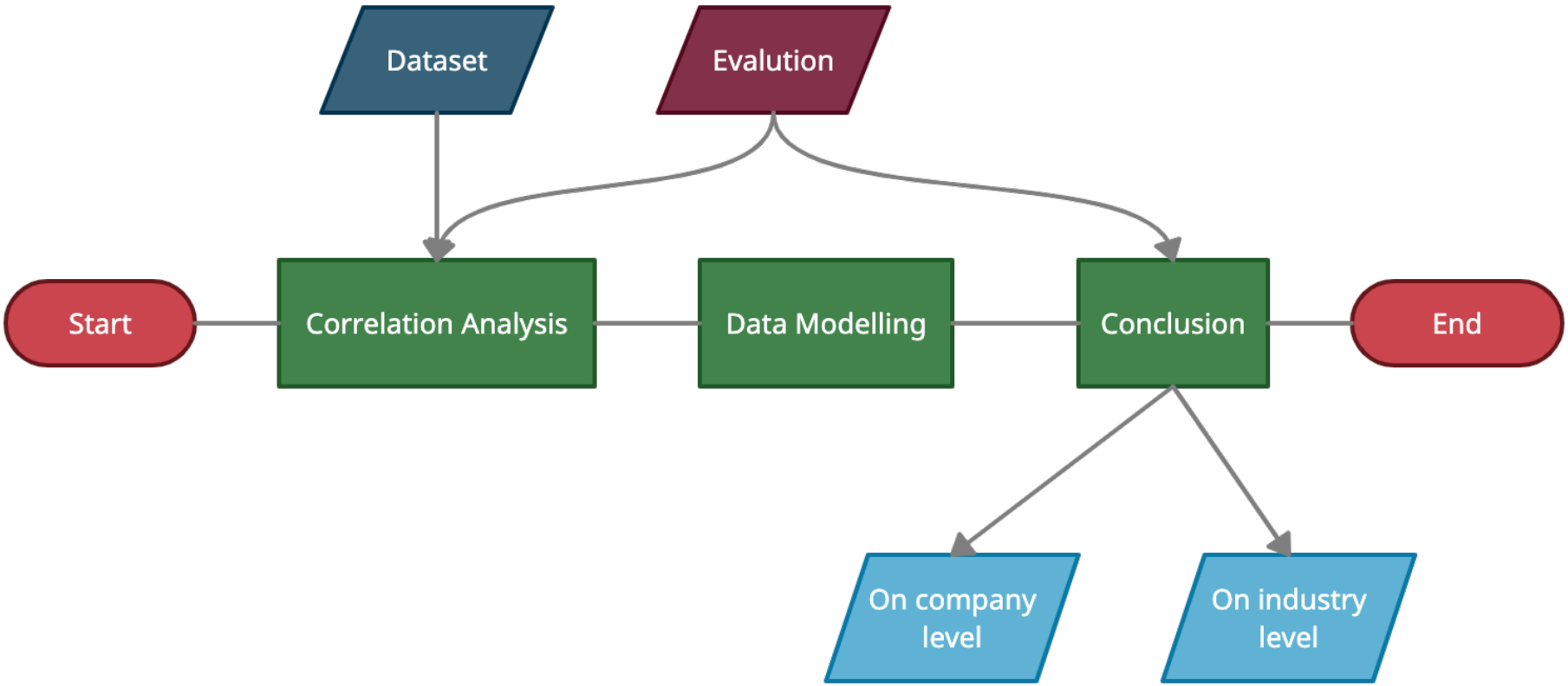
Results

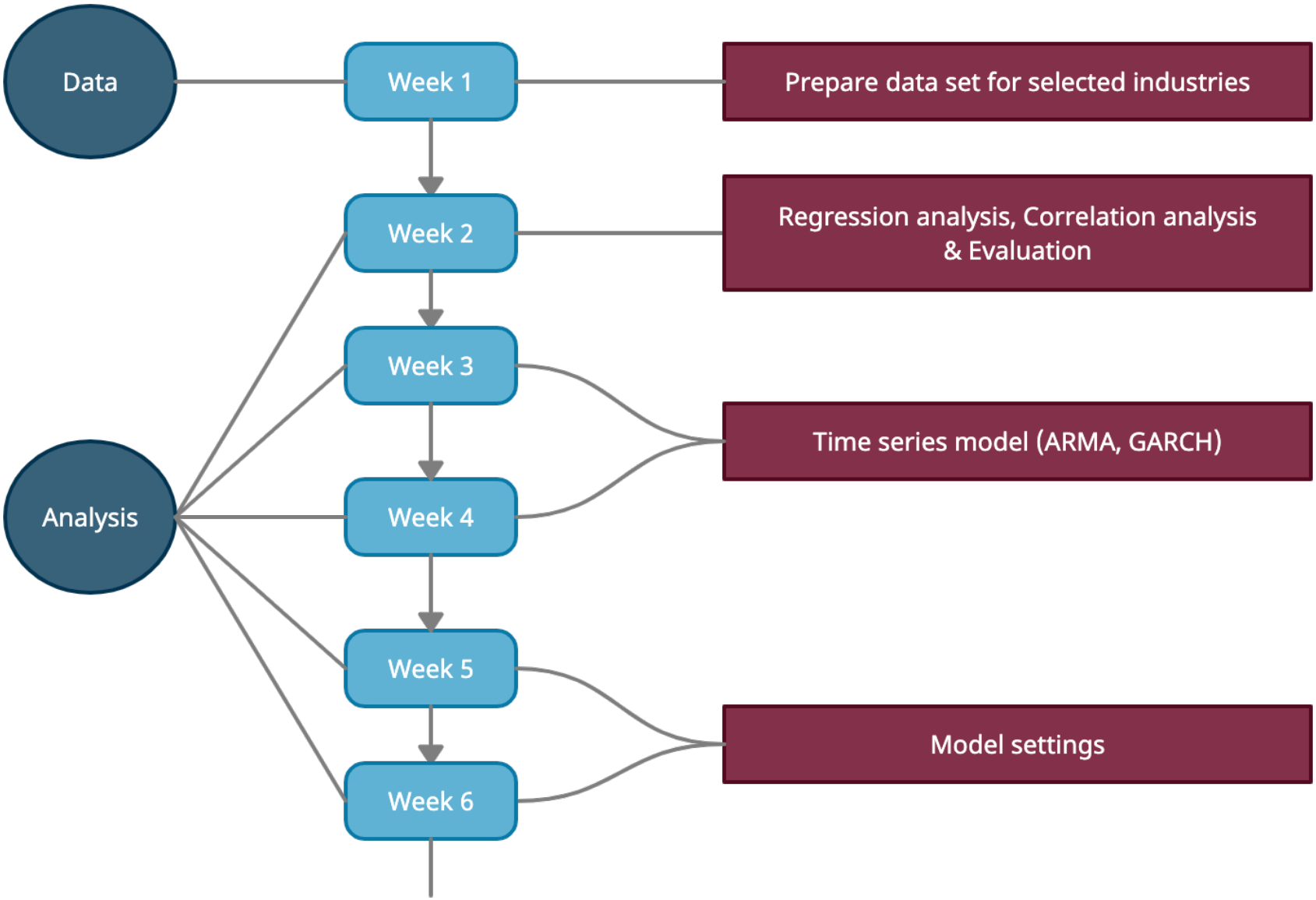
- ROA and temperature difference:
  Intrepid Potash
- ROA difference and temperature difference:
  CF Industries Holdings, CVR Partners
- ROA and bushfire burnt areas:
  None

1. Introduction
2. Literature Findings
3. Preliminary Analysis
4. Future Plan
   - Pipeline and Weekly Plan
   - Model and Challenges
   - Roles and Responsibility

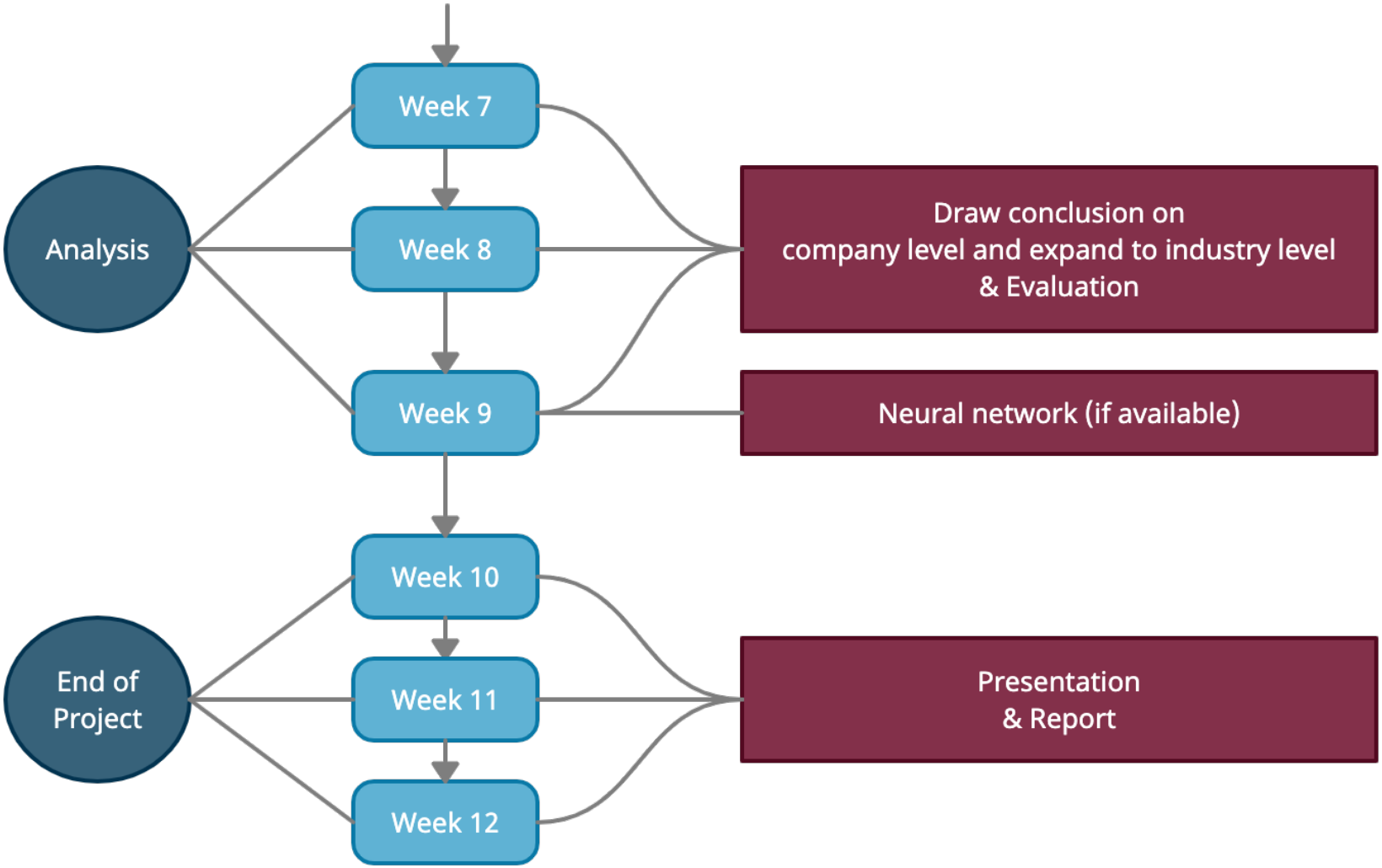
Pipeline


Dataset
Evalution
Start
Correlation Analysis
Data Modelling
Conclusion
End
On company level
On industry level

Weekly Plan


Data
Analysis
Week 1
Week 2
Week 3
Week 4
Week 5
Week 6
Prepare data set for selected industries
Regression analysis, Correlation analysis & Evaluation
Time series model (ARMA, GARCH)
Model settings

Weekly Plan


Week 7
Analysis
Week 8
Draw conclusion on
company level and expand to industry level
& Evaluation
Week 9
Neural network (if available)
Week 10
End of
Project
Week 11
Presentation
& Report
Week 12

Model and Challenges

- Model: Time series model
- Reason:
  1. Many papers prefer time series model
  2. Fit our data
- Challenges:
  - Generalize conclusions to industry level
  - Gather different climate events into one formula

Roles and Responsibility

Group Member	Role	Task Allocation
Andrew Stringer	Team Leader	Modelling exploration; Literature review; Time series analysis
Chao Jia	Lead Researcher	Data crawling; Coding; Literature review; Time series analysis
Xin Wei	Industry Partner Contact	Data crawling; Check the accuracy of the code; Modelling exploration
Wei Li	Project Manager	Coding process; Correlation analysis; Literature review

Thanks For Watching