Beta Presentation
Predictive Claims Scoring
The Capstone Experience
Team Rooseveltt Innovations Data Science
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Project Overview

• Reviewing dental insurance claim models is a time-consuming process.
• Predictive Claims Scoring accelerates claim reviewal by identifying patterns in denied claims.
• A machine learning model scores every claim on its likelihood of FWA.
• A web application gives a business persona a user-friendly way to search for claim scores and metrics.
• Tableau dashboards give a data science persona exploratory analysis of the metrics and model.
System Architecture

- **Claims Data** → **snowflake** (Database) → **Tableau** (Dashboard)
  - **Python**, **pandas**, **LightGBM**, **scikit-learn**
  - **FastAPI**, **HTML**, **CSS**, **JS**

- **Data Scientist**
- **Business Analyst**
ML Model Dashboard

[Graphs and charts showing model evaluation metrics, including ROC curves and precision-recall plots.]
Tooth Position Dashboard
Insurance and Procedure Dashboard
Patient History Dashboard
### Claim Search

Enter Claim Number:

![](image)

<table>
<thead>
<tr>
<th>Claim Number</th>
<th>FWA Likelihood</th>
<th>Abraision</th>
<th>Entitlement Type</th>
<th>State</th>
<th>Number of Crowns</th>
<th>Crowns per Filing</th>
<th>Date Received</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>19.639%</td>
<td>No</td>
<td>Medicaid</td>
<td>MI</td>
<td>0</td>
<td>0.03</td>
<td>2/18/2022</td>
</tr>
<tr>
<td>2</td>
<td>0.254%</td>
<td>No</td>
<td>Medicaid</td>
<td>MI</td>
<td>0</td>
<td>0.67</td>
<td>6/1/2022</td>
</tr>
<tr>
<td>3</td>
<td>0.205%</td>
<td>No</td>
<td>Medicaid</td>
<td>MI</td>
<td>0</td>
<td>0.38</td>
<td>6/22/2022</td>
</tr>
<tr>
<td>4</td>
<td>1.947%</td>
<td>No</td>
<td>Medicaid</td>
<td>MI</td>
<td>0</td>
<td>0.2</td>
<td>9/16/2022</td>
</tr>
<tr>
<td>5</td>
<td>18.999%</td>
<td>No</td>
<td>Medicare</td>
<td>MI</td>
<td>0</td>
<td>0.1</td>
<td>1/10/2022</td>
</tr>
<tr>
<td>6</td>
<td>2.052%</td>
<td>No</td>
<td>Medicare</td>
<td>MI</td>
<td>0</td>
<td>0.08</td>
<td>1/28/2022</td>
</tr>
<tr>
<td>7</td>
<td>1.967%</td>
<td>No</td>
<td>Medicare</td>
<td>MI</td>
<td>0</td>
<td>0.47</td>
<td>1/31/2022</td>
</tr>
<tr>
<td>8</td>
<td>34.984%</td>
<td>No</td>
<td>Medicare</td>
<td>MI</td>
<td>0</td>
<td>0.33</td>
<td>2/2/2022</td>
</tr>
</tbody>
</table>
Claim Results Page 1

![Claim Information Table and Graph](image)

<table>
<thead>
<tr>
<th>Claim Number</th>
<th>Abrasion</th>
<th>Entitlement Type</th>
<th>State</th>
<th>Number of Crowns</th>
<th>Crowns per Filling</th>
<th>Date Received</th>
<th>FWA Likelihood</th>
</tr>
</thead>
<tbody>
<tr>
<td>203</td>
<td>Yes</td>
<td>Medicare</td>
<td>MI</td>
<td>0</td>
<td>0.19</td>
<td>6/6/2022</td>
<td>7.663%</td>
</tr>
</tbody>
</table>

Values most influential in the machine learning model's determining of the likelihood of FWA:

- Metric 2 = Yes
- Metric 3 = 1
- Tooth position = Anterior
- Tooth type = Canine
- Procedure code = C2740

![Chart showing Number of Crowns and Crowns per Filling](image)
Claim Results Page 2
What’s left to do?

• Stretch Goals
  ▪ "Insert Batch of Claims" webpage
  ▪ Comments section on Claim Result webpage
  ▪ Display Top metrics for each model on Tableau

• Other Tasks
  ▪ Change the website colors and fonts to fit the internal Roosevelt Innovations websites
  ▪ Match Tableau colors with that of web app
Questions?