



Weekly Capstone Update Meeting

Nov 4 2022

PA Dept. of Labor & Industry + CMU

Goals for today

Discuss work completed this past week

Discuss accessibility of the application

Discuss the visualization of analysis reports

Discuss timeline for next weeks

Done this past week

November/December

23 Sprint 4

30 Sprint 5

6 Sprint 6



13 Sprint 7

20 Finalize Build & Break

- Built upload ETL to upload medical costs into the database
- merge files related with medical cost uploading into the main repository
- Extended prediction by severity and made some analysis
- Simulated the production environment to test newly built functionalities
- Began working on export prediction button on web application

Project deliverables (from midterm)

Upload medical costs to database through the interface

Analyze injury rates by severity – updated with medical costs

Surface prediction output in an Excel report

Visual top 5 counties/industries injury rate and medical costs in Power BI report

Progress on project deliverables

Upload medical costs to database through the interface

Analyze injury rates by severity – updated with medical costs

Surface prediction output in an Excel report

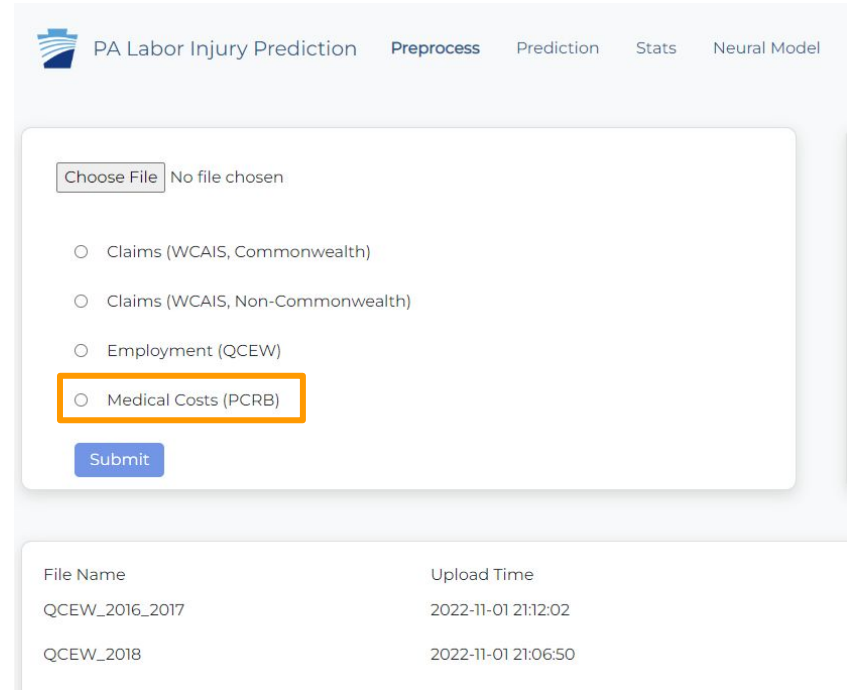
Visual top 5 counties/industries injury rate and medical costs in Power BI report



**Adding
medical costs**

Upload medical costs

- Created new table medical cost in database
- Added radio button for medical costs in UI
- Built upload ETL to upload medical costs into the database
- Updated upload UI to clarify files to upload
- Merged files related with these functionality into the main repository



The screenshot displays the 'PA Labor Injury Prediction' web application. The navigation bar includes links for 'Preprocess', 'Prediction', 'Stats', and 'Neural Model'. The main content area features a file upload section with a 'Choose File' button and a 'No file chosen' status. Below this, there are four radio button options: 'Claims (WCAIS, Commonwealth)', 'Claims (WCAIS, Non-Commonwealth)', 'Employment (QCEW)', and 'Medical Costs (PCRB)'. The 'Medical Costs (PCRB)' option is selected and highlighted with an orange border. A blue 'Submit' button is located below the radio buttons. At the bottom, a table lists uploaded files with their names and upload times.

File Name	Upload Time
QCEW_2016_2017	2022-11-01 21:12:02
QCEW_2018	2022-11-01 21:06:50

Adding Medical Costs

Next steps:

- Improve comments in codes of this part
- Determine how to handle missingness on WCAIS Claims that can't be linked to PCRB data

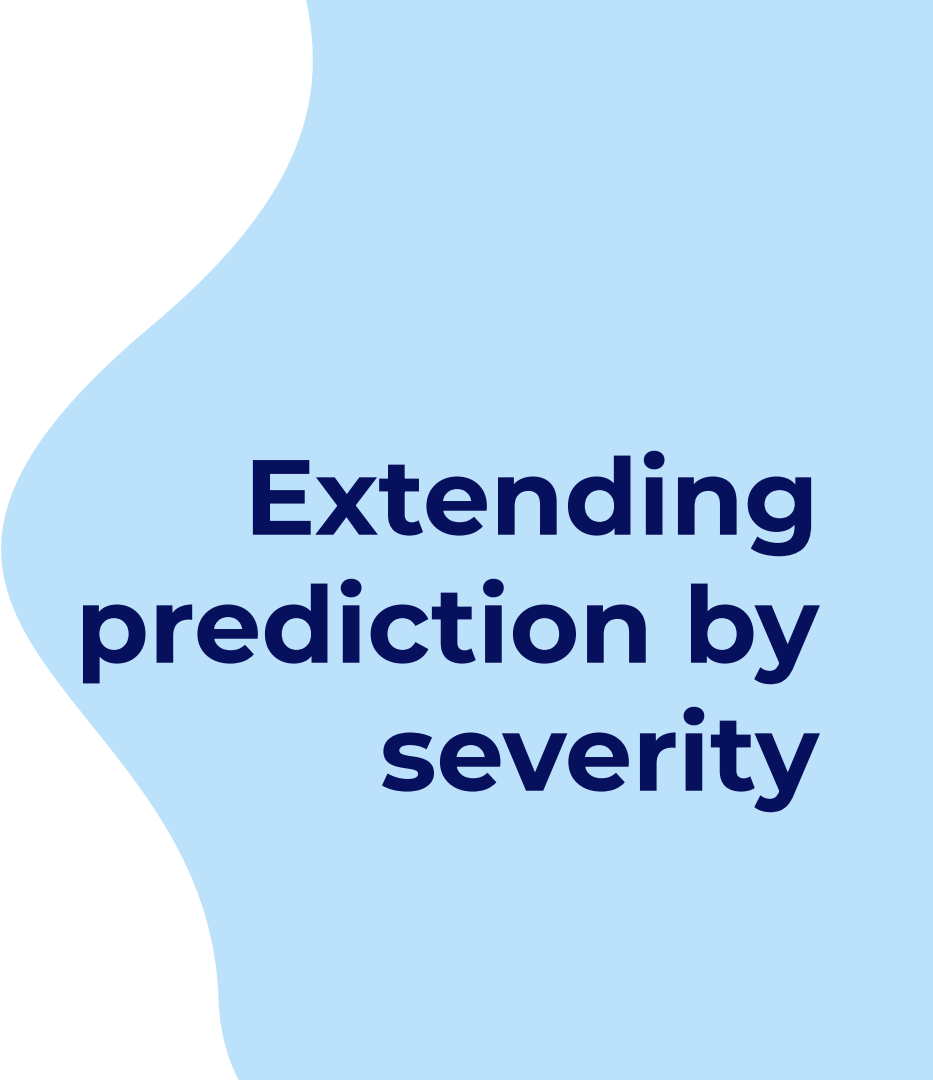
Progress on project deliverables

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**Extending
prediction by
severity**

Injury rate actual & predicted

naics_code	county	year	month	date	severity	claim_number	emp_count	injury_rate	type	county_formatted	month_str	naics_level	commonwealth	task_id	
62	Adams County	2021	7	7/1/2021	Medium		5	4853	0.001030291	Actual	Adams County PA	July	2	TRUE	37
62	Adams County	2021	8	8/1/2021	Medium		9	4869	0.001848429	Actual	Adams County PA	August	2	TRUE	37
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62	Adams County	2022	3	3/1/2022	All	14.27399271		4887	0.002920809	Predicted	Adams County PA	March	2	TRUE	37
62	Adams County	2022	4	4/1/2022	All	11.45143049		4887	0.002343243	Predicted	Adams County PA	April	2	TRUE	37
62	Adams County	2022	5	5/1/2022	All	10.51530828		4887	0.00215169	Predicted	Adams County PA	May	2	TRUE	37
62	Adams County	2022	6	6/1/2022	All	8.542769848		4887	0.00174806	Predicted	Adams County PA	June	2	TRUE	37
62	Adams County	2022	7	7/1/2022	All	10.69865956		4887	0.002189208	Predicted	Adams County PA	July	2	TRUE	37
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62	Adams County	2022	10	10/1/2022	All	12.66060637		4887	0.00259067	Predicted	Adams County PA	October	2	TRUE	37
62	Adams County	2022	11	11/1/2022	All	14.66306135		4887	0.003000422	Predicted	Adams County PA	November	2	TRUE	37
62	Adams County	2022	12	12/1/2022	All	6.628599808		4887	0.001356374	Predicted	Adams County PA	December	2	TRUE	37
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62	Adams County	2022	1	1/1/2022	Low	2.976619193		4887	0.000609089	Predicted	Adams County PA	January	2	TRUE	37
62	Adams County	2022	2	2/1/2022	Low	2.98013854		4887	0.000609809	Predicted	Adams County PA	February	2	TRUE	37
62	Adams County	2022	3	3/1/2022	Low	6.871407312		4887	0.001406058	Predicted	Adams County PA	March	2	TRUE	37
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62	Adams County	2022	5	5/1/2022	Low	3.989394326		4887	0.000816328	Predicted	Adams County PA	May	2	TRUE	37
62	Adams County	2022	6	6/1/2022	Low	3.991195548		4887	0.000816696	Predicted	Adams County PA	June	2	TRUE	37
62	Adams County	2022	7	7/1/2022	Low	6.058411662		4887	0.0012397	Predicted	Adams County PA	July	2	TRUE	37

Predicted
injury
rate
by
severity

naics_code	county	year	month	date	severity	claim_number	emp_count	injury_rate	type	county_formatted	month_str	naics_level	commonwealth	task_id
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62	Adams County	2022	7	7/1/2022	Low	6.058411662	4887	0.0012397	Predicted	Adams County PA	July	2	TRUE	37

Overall
predicted
injury
rate and
count

naics_code	county	year	month	date	severity	claim_number	emp_count	injury_rate	type	county_formatted	month_str	naics_level	commonwealth	task_id
62	Adams County	2021	7	7/1/2021	Medium	5	4853	0.001030291	Actual	Adams County PA	July	2	TRUE	37
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62	Adams County	2022	9	9/1/2022	High		1	4887	0.000204625	Predicted	Adams County PA	September	2	TRUE	37
62	Adams County	2022	10	10/1/2022	High		1	4887	0.000204625	Predicted	Adams County PA	October	2	TRUE	37
62	Adams County	2022	11	11/1/2022	High		1	4887	0.000204625	Predicted	Adams County PA	November	2	TRUE	37
62	Adams County	2022	12	12/1/2022	High		2	4887	0.000409249	Predicted	Adams County PA	December	2	TRUE	37
62	Adams County	2022	1	1/1/2022	Low		2.976619193	4887	0.000609089	Predicted	Adams County PA	January	2	TRUE	37
62	Adams County	2022	2	2/1/2022	Low		2.98013854	4887	0.000609809	Predicted	Adams County PA	February	2	TRUE	37
62	Adams County	2022	3	3/1/2022	Low		6.871407312	4887	0.001406058	Predicted	Adams County PA	March	2	TRUE	37
62	Adams County	2022	4	4/1/2022	Low		4.958956577	4887	0.001014724	Predicted	Adams County PA	April	2	TRUE	37
62	Adams County	2022	5	5/1/2022	Low		3.989394326	4887	0.000816328	Predicted	Adams County PA	May	2	TRUE	37
62	Adams County	2022	6	6/1/2022	Low		3.991195548	4887	0.000816696	Predicted	Adams County PA	June	2	TRUE	37
62	Adams County	2022	7	7/1/2022	Low		6.058411662	4887	0.0012397	Predicted	Adams County PA	July	2	TRUE	37

Predicted
high
severity

naics_code	county	year	month	date	severity	claim_number	emp_count	injury_rate	type	county_formatted	month_str	naics_level	commonwealth	task_id	
62	Adams County	2021	7	7/1/2021	Medium		5	4853	0.001030291	Actual	Adams County PA	July	2	TRUE	37
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62	Adams County	2021	9	9/1/2021	Medium		9	4838	0.001860273	Actual	Adams County PA	September	2	TRUE	37
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62	Adams County	2021	11	11/1/2021	Medium		10	4875	0.002051282	Actual	Adams County PA	November	2	TRUE	37
62	Adams County	2021	12	12/1/2021	Medium		3	4887	0.000613874	Actual	Adams County PA	December	2	TRUE	37
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62	Adams County	2022	2	2/1/2022	All		15.30427548	4887	0.00313163	Predicted	Adams County PA	February	2	TRUE	37
62	Adams County	2022	3	3/1/2022	All		14.27399271	4887	0.002920809	Predicted	Adams County PA	March	2	TRUE	37
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62	Adams County	2022	9	9/1/2022	All		14.77039394	4887	0.003022385	Predicted	Adams County PA	September	2	TRUE	37
62	Adams County	2022	10	10/1/2022	All		12.66060637	4887	0.00259067	Predicted	Adams County PA	October	2	TRUE	37
62	Adams County	2022	11	11/1/2022	All		14.66306135	4887	0.003000422	Predicted	Adams County PA	November	2	TRUE	37
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62	Adams County	2022	7	7/1/2022	High		1	4887	0.000204625	Predicted	Adams County PA	July	2	TRUE	37
62	Adams County	2022	8	8/1/2022	High		2.003696858	4887	0.000410005	Predicted	Adams County PA	August	2	TRUE	37
62	Adams County	2022	9	9/1/2022	High		1	4887	0.000204625	Predicted	Adams County PA	September	2	TRUE	37
62	Adams County	2022	10	10/1/2022	High		1	4887	0.000204625	Predicted	Adams County PA	October	2	TRUE	37
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62	Adams County	2022	12	12/1/2022	High		2	4887	0.000409249	Predicted	Adams County PA	December	2	TRUE	37
62	Adams County	2022	1	1/1/2022	Low		2.976619193	4887	0.000609089	Predicted	Adams County PA	January	2	TRUE	37
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62	Adams County	2022	3	3/1/2022	Low		6.871407312	4887	0.001406058	Predicted	Adams County PA	March	2	TRUE	37
62	Adams County	2022	4	4/1/2022	Low		4.958956577	4887	0.001014724	Predicted	Adams County PA	April	2	TRUE	37
62	Adams County	2022	5	5/1/2022	Low		3.989394326	4887	0.000816328	Predicted	Adams County PA	May	2	TRUE	37
62	Adams County	2022	6	6/1/2022	Low		3.991195548	4887	0.000816696	Predicted	Adams County PA	June	2	TRUE	37
62	Adams County	2022	7	7/1/2022	Low		6.058411662	4887	0.0012397	Predicted	Adams County PA	July	2	TRUE	37

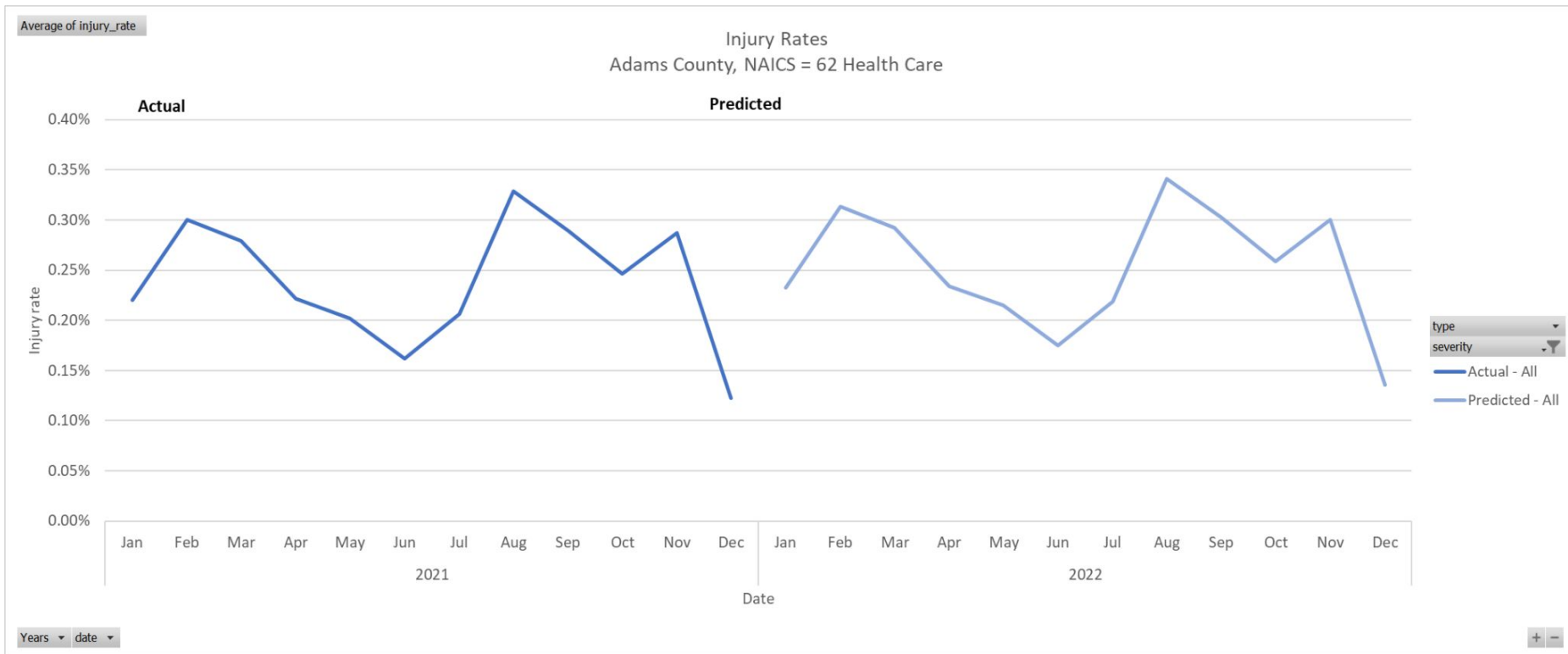
Predicted
low
severity

naics_code	county	year	month	date	severity	claim_number	emp_count	injury_rate	type	county_formatted	month_str	naics_level	commonwealth	task_id	
62	Adams County	2021	7	7/1/2021	Medium		5	4853	0.001030291	Actual	Adams County PA	July	2	TRUE	37
62	Adams County	2021	8	8/1/2021	Medium		9	4869	0.001848429	Actual	Adams County PA	August	2	TRUE	37
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62	Adams County	2021	12	12/1/2021	Medium		3	4887	0.000613874	Actual	Adams County PA	December	2	TRUE	37
62	Adams County	2022	1	1/1/2022	All	11.37140556		4887	0.002326868	Predicted	Adams County PA	January	2	TRUE	37
62	Adams County	2022	2	2/1/2022	All	15.30427548		4887	0.00313163	Predicted	Adams County PA	February	2	TRUE	37
62	Adams County	2022	3	3/1/2022	All	14.27399271		4887	0.002920809	Predicted	Adams County PA	March	2	TRUE	37
62	Adams County	2022	4	4/1/2022	All	11.45143049		4887	0.002343243	Predicted	Adams County PA	April	2	TRUE	37
62	Adams County	2022	5	5/1/2022	All	10.51530828		4887	0.00215169	Predicted	Adams County PA	May	2	TRUE	37
62	Adams County	2022	6	6/1/2022	All	8.542769848		4887	0.00174806	Predicted	Adams County PA	June	2	TRUE	37
62	Adams County	2022	7	7/1/2022	All	10.69865956		4887	0.002189208	Predicted	Adams County PA	July	2	TRUE	37
62	Adams County	2022	8	8/1/2022	All	16.68774953		4887	0.003414723	Predicted	Adams County PA	August	2	TRUE	37
62	Adams County	2022	9	9/1/2022	All	14.77039394		4887	0.003022385	Predicted	Adams County PA	September	2	TRUE	37
62	Adams County	2022	10	10/1/2022	All	12.66060637		4887	0.00259067	Predicted	Adams County PA	October	2	TRUE	37
62	Adams County	2022	11	11/1/2022	All	14.66306135		4887	0.003000422	Predicted	Adams County PA	November	2	TRUE	37
62	Adams County	2022	12	12/1/2022	All	6.628599808		4887	0.001356374	Predicted	Adams County PA	December	2	TRUE	37
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62	Adams County	2022	3	3/1/2022	High		1	4887	0.000204625	Predicted	Adams County PA	March	2	TRUE	37
62	Adams County	2022	4	4/1/2022	High	1.983893698		4887	0.000405953	Predicted	Adams County PA	April	2	TRUE	37
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62	Adams County	2022	2	2/1/2022	Low	2.98013854		4887	0.000609809	Predicted	Adams County PA	February	2	TRUE	37
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62	Adams County	2022	5	5/1/2022	Low	3.989394326		4887	0.000816328	Predicted	Adams County PA	May	2	TRUE	37
62	Adams County	2022	6	6/1/2022	Low	3.991195548		4887	0.000816696	Predicted	Adams County PA	June	2	TRUE	37
62	Adams County	2022	7	7/1/2022	Low	6.058411662		4887	0.0012397	Predicted	Adams County PA	July	2	TRUE	37

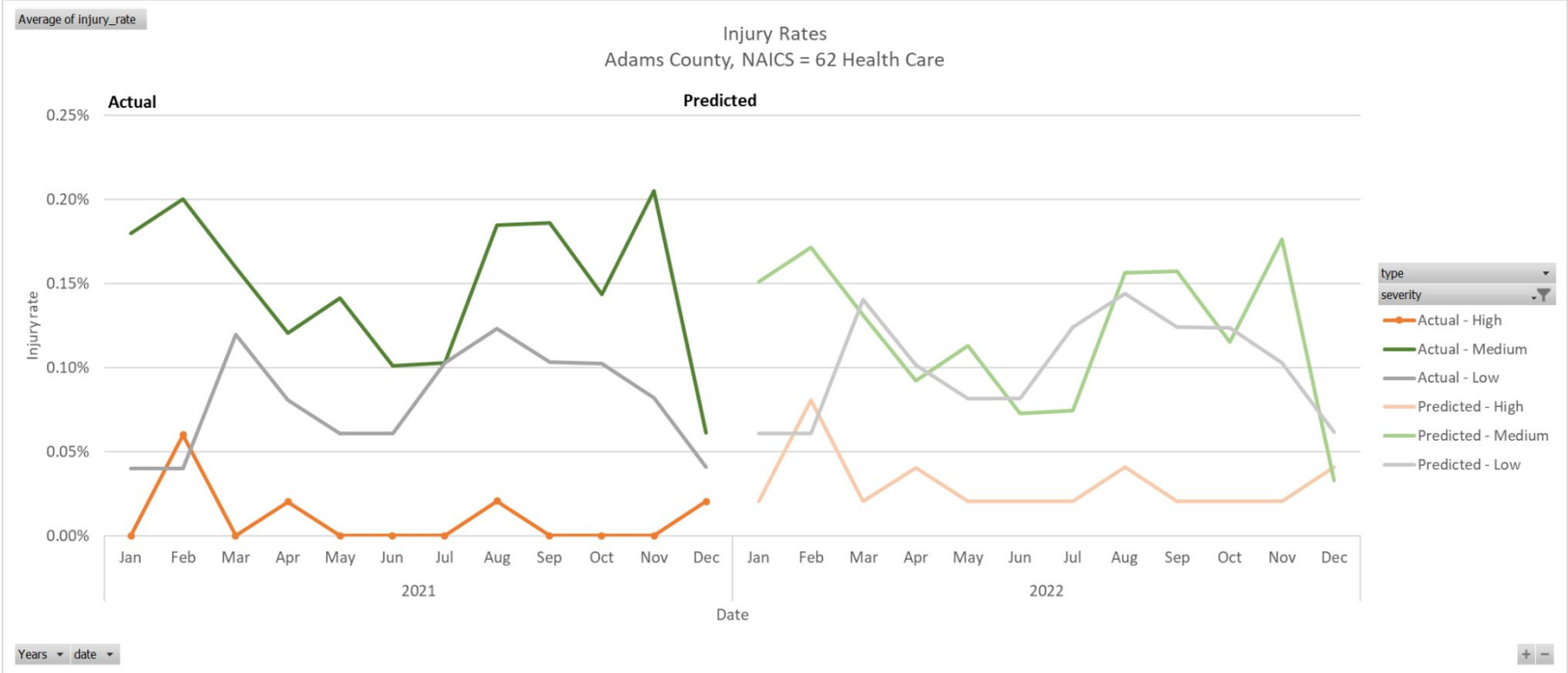
Predicted
medium
severity



Overall injury rate



Injury rate broken down by severity



What is next

Measure impact on prediction run time

Add medical costs into severity definition (methods discussed last week)

Progress on project deliverables

Upload medical costs to database through the interface 

Analyze injury rates by severity – updated with medical costs

Surface prediction output in an Excel report

Visual top 5 counties/industries injury rate and medical costs in Power BI report

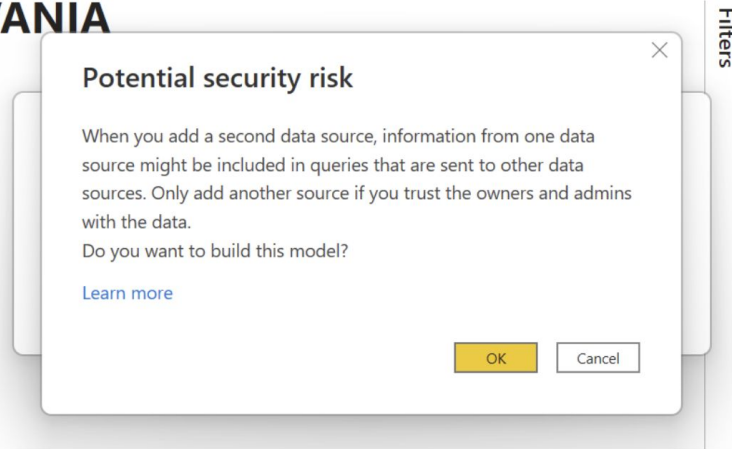


Visualizing the results

What was blocking us previously

Problems: Issues of connecting database to retrieve data

.VANIA



Steps: Unblock the team from this issue and get the Power BI working

[illegible]

Visualizing the results

Next steps:

- Finalize what types of data should be included in Power BI reports
- Mockup new dashboard, **e.g.** adding top 5 counties/industries injury rates and medical costs, matrix analysis

What is the key data comparisons you are looking to see?

Are there anything we haven't discussed that you want to see in report?



Application setting up

Access the application remotely

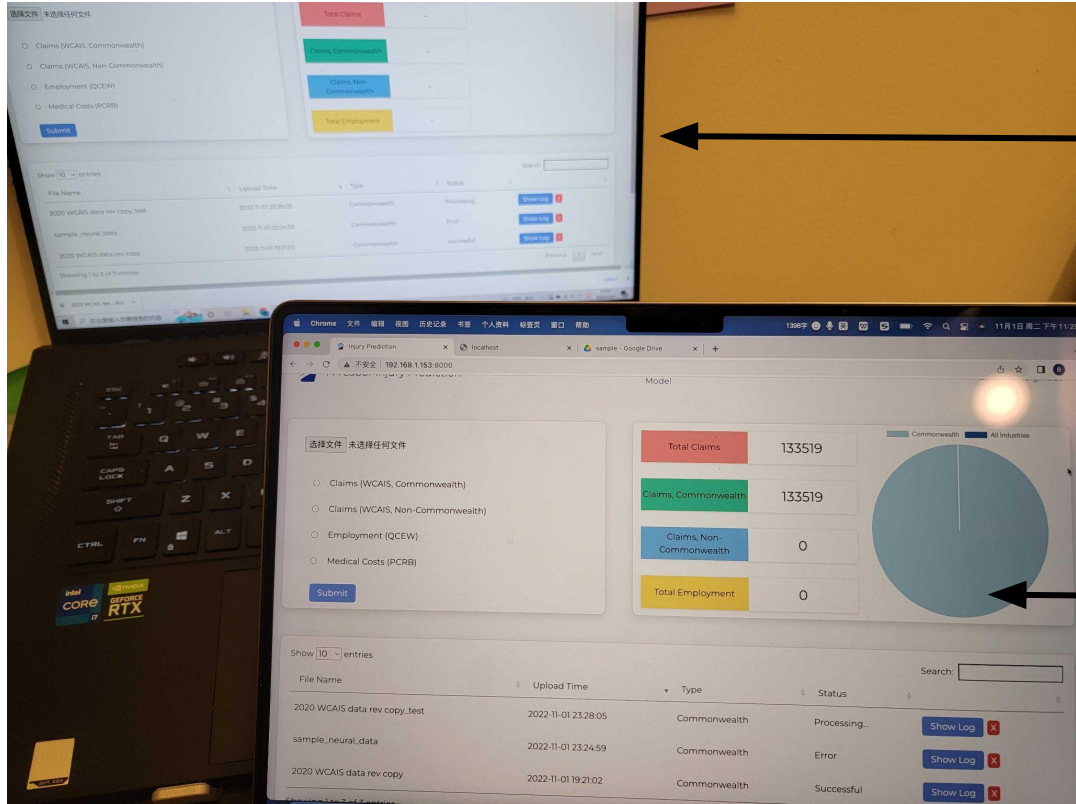
Goal:

Ensure those new functionalities merged into the project can work *not only locally but also remotely*

Methods:

Simulating the production environment, using one PC to host the application, and using another PC to access the application and test those newly merged functionalities.

Access the application remotely



Machine 1:
Hosting the application

Machine 2:
Accessing the application
through URL

**Successfully access the
application remotely**



Access the application remotely

	id	password	last_login	is_superuser	username	f
1	1	pbkdf2_sha256\$150000\$o2kfQzLrII5H\$WunyOSSgc12U1...	2022-11-02 03:23:26.6790180	1	admin	
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Admin is used for Machine 1

Admin_test is used for Machine 2

	id	file_name	file	file_type	status	log	
1	1	2020 WCAIS data rev copy	2020_WCAIS_data_rev_copy.xlsx	Commonwealth	Successful	[19:23:04]	Successfully 1
2	2	sample_neural_data	sample_neural_data.xlsx	Commonwealth	Error	[23:25:05]	Column 'NAICS'
3	3	2020 WCAIS data rev copy_test	2020_WCAIS_data_rev_copy_test.xlsx	Commonwealth	Successful	[23:29:58]	Successfully 1
4	4	Test_Task 2020 WCAIS data rev	Test_Task_2020_WCAIS_data_rev.xlsx	Commonwealth	Successful	[19:57:01]	Successfully 1

Task 1,2,3 were submitted by Machine 1

Task 4 was submitted by Machine 2

**Successfully access the
database remotely**



Access the application remotely

PA Labor Injury Prediction Preprocess Prediction Stats Neural Model Report Help Admin Sign out

选择文件 未选择任何文件

☐ Claims (WCAIS, Commonwealth)

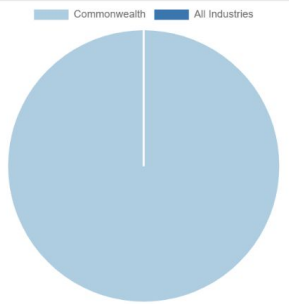
☐ Claims (WCAIS, Non-Commonwealth)

☐ Employment (QCEW)

☐ Medical Costs (PCRB)

Submit

Total Claims	400557
Claims, Commonwealth	400557
Claims, Non-Commonwealth	0
Total Employment	0



Commonwealth All Industries

Show 10 entries Search:

File Name	Upload Time	Type	Status	
Test_Task 2020 WCAIS data rev	2022-11-03 19:54:53	Commonwealth	Successful	Show Log X
2020 WCAIS data rev copy_test	2022-11-01 23:28:05	Commonwealth	Successful	Show Log X
sample_neural_data	2022-11-01 23:24:59	Commonwealth	Error	Show Log X
2020 WCAIS data rev copy	2022-11-01 19:21:02	Commonwealth	Successful	Show Log X

Showing 1 to 4 of 4 entries Previous

Newly merged functionalities work well locally and remotely!

Successfully test these functions remotely



Submitted by Machine 2

Submitted by Machine 1

Application setting up

- How does the application hosted currently (on IIS)?
- Flexible with other web servers or hosting ways?
- How can we help with pulling and re-deploying the application?

Next Week's Sprint

- Update requirements.txt file. Update versions and remove unneeded packages
- Format and optimize the UI layout of the Power BI report
- Implement the functionality of exporting model predictions
- Further exploration on hosting (Depend on today's discussion)