Ontario

Ontario Safety Incidents Trends Analysis for Ministry of Labor, Immigration, Training and Skills Development (MLITSD)

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Assignment - OPS Competition 221695
Job ID - 221695
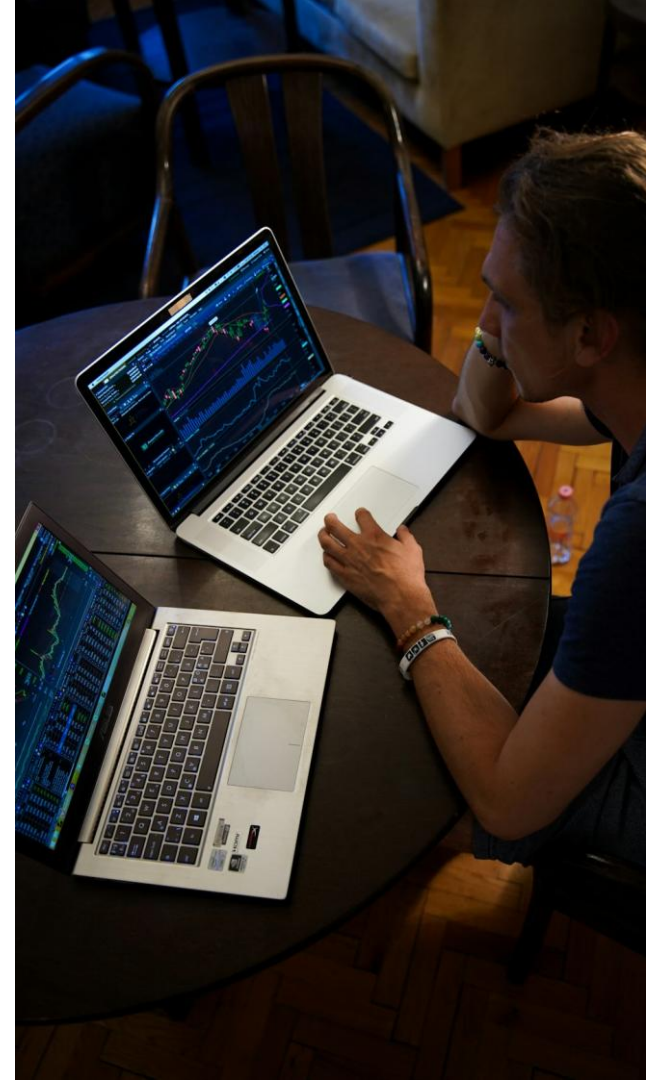
Project Objectives

Uncover seasonal patterns and correlation with factors impacting safety incident events in Ontario.

Key Insights from data analysis and trends.

Recommendations for Ontario workplaces safety at different sectors.

Data Overview

❑ **Dataset 1**

Data columns (total 9 columns):

#	Column	Non-Null Count	Dtype
0	EVENT DATE	16321 non-null	object
1	Program	16321 non-null	object
2	MUNICIPALITY	15996 non-null	object
3	REGION	15183 non-null	object
4	PRIMARY OCCUPATION CODE	16014 non-null	float64
5	OCCUPATION DESCRIPTION	16014 non-null	object
6	SECTOR CODE	16017 non-null	object
7	SECTOR DESCRIPTION	16017 non-null	object
8	WORKER COUNT	14558 non-null	object

**Data Shape : (Rows, Columns)** → (16291, 9)

❑ **Dataset 2**

Data columns (total 14 columns):

| #	Column	Non-Null Count	Dtype
0	Accident_Date	15455 non-null	object
1	Worker_age	15450 non-null	float64
2	Occupation_Category_Code	15455 non-null	object
3	Occupation_Category_Description	15455 non-null	object
4	Occupation_Code	15455 non-null	object
5	Occupation Description	15455 non-null	object
6	Worker_Experience_in_Years	13750 non-null	float64
7	Accident_Source_Category_Description1	15455 non-null	object
8	Source_Category_Description2	15455 non-null	object
9	Accident_Category_Description	15455 non-null	object
10	Accident_Place_Description	15455 non-null	object
11	Organization_City	15347 non-null	object
12	Organization_Province_Code	15342 non-null	object
13	Industry_Sector_Description	15455 non-null	object

Data Shape : (Rows, Columns) → (15455, 14)
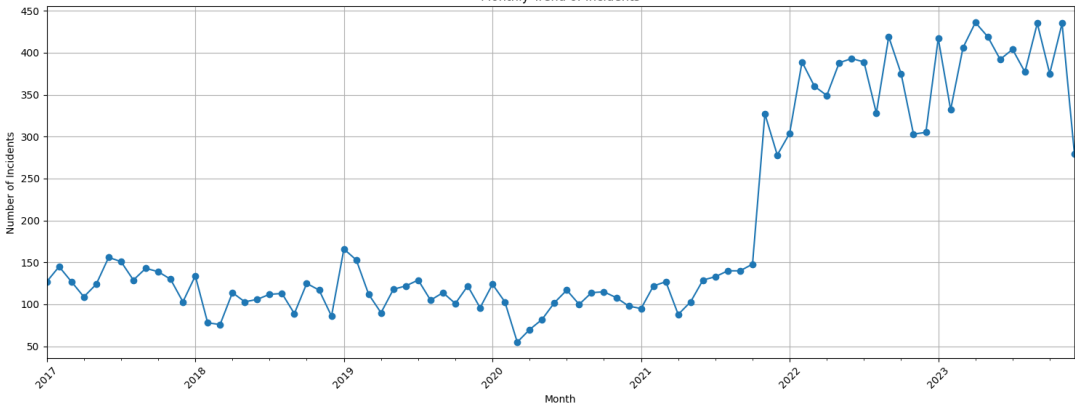
Incident Overview by Region, Sectors and Worker Count
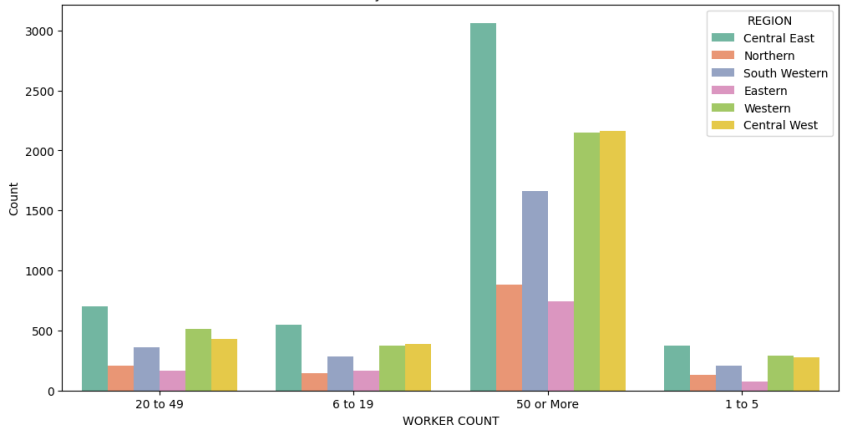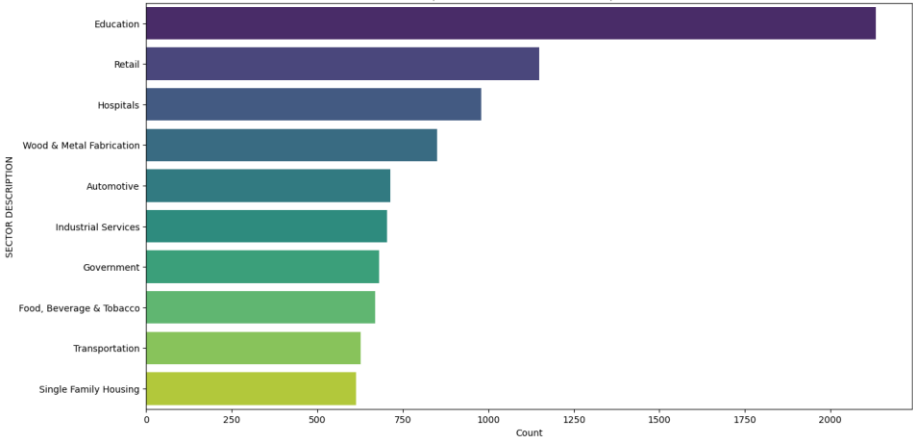
Incident Overview by Accident Categories and Occupations

Workplace Accidents Analysis

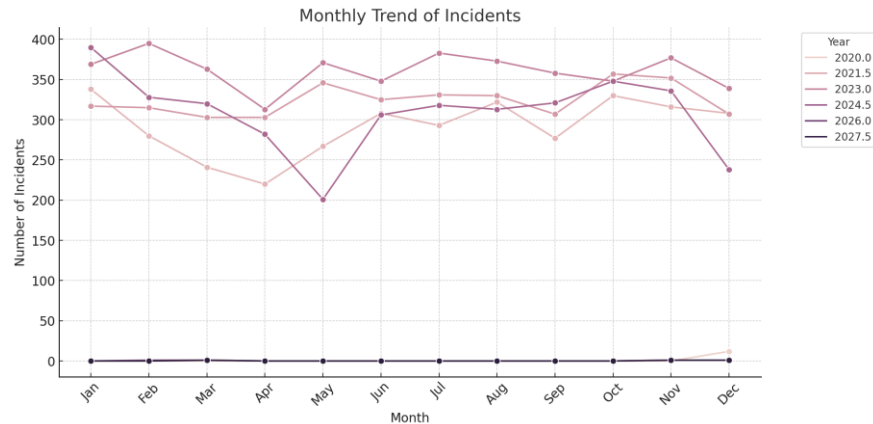## Top 10 Accident Categories

Category	
NONHIGHWAY ACCIDENT, EXCEPT RAIL, AIR, WATER	
PEDESTRIAN STRUCK BY VEHICLE, MOBILE EQUIPMENT	
OVEREXERTION	
HIGHWAY ACCIDENT	
STRUCK AGAINST OBJECT	
CAUGHT IN OR COMPRESSED BY EQUIP./OBJECTS	
BODILY REACTION	
STRUCK BY OBJECT	
FALL TO LOWER LEVEL	
FALL ON SAME LEVEL	

(x-axis: 0, 1000, 2000, 3000, 4000, 5000)

Distribution

35.3%, 21.6%, 14.1%, 8.93%, 7%, 4.38%, 2.82%, 2.08%, 1.92%, 1.83%

Top 10 Occupations

Occupation	
AGRICULTURE AND HORTICULTURE WORKERS	
OTHER INSTALLERS, REPAIRERS AND SERVICERS	
CARPENTERS AND CABINETMAKERS	
ASSISTING OCCUPATIONS IN SUPPORT OF HEALTH SERVICES	
CLEANERS	
RETAIL SALESPERSONS AND SALES CLERKS	
LABOURERS IN PROCESSING, MANUFACTURING AND UTILITIES	
LONGSHORE WORKERS AND MATERIAL HANDLERS	
TRADES HELPERS AND LABOURERS	
MOTOR VEHICLE AND TRANSIT DRIVERS	

(x-axis: 0, 500, 1000, 1500)

Distribution

23.8%, 16.3%, 12%, 10.2%, 7.58%, 7.58%, 7.32%, 6.02%, 5.23%, 4.04%

Accident Trends & Industry-Wise Reports in Ontario
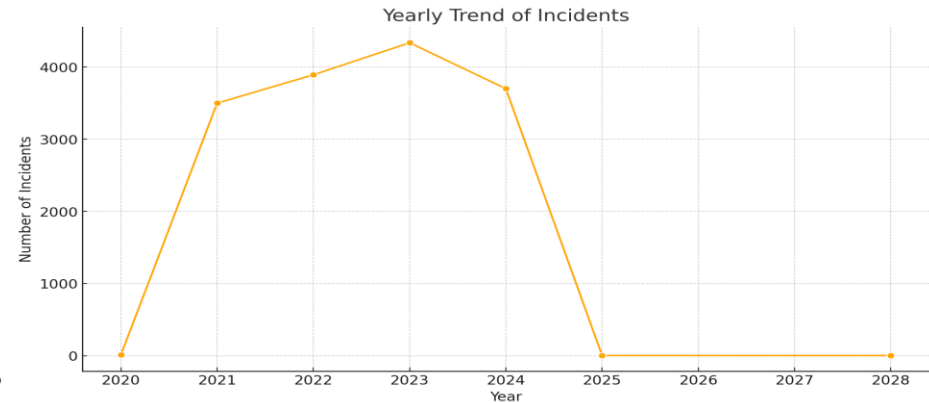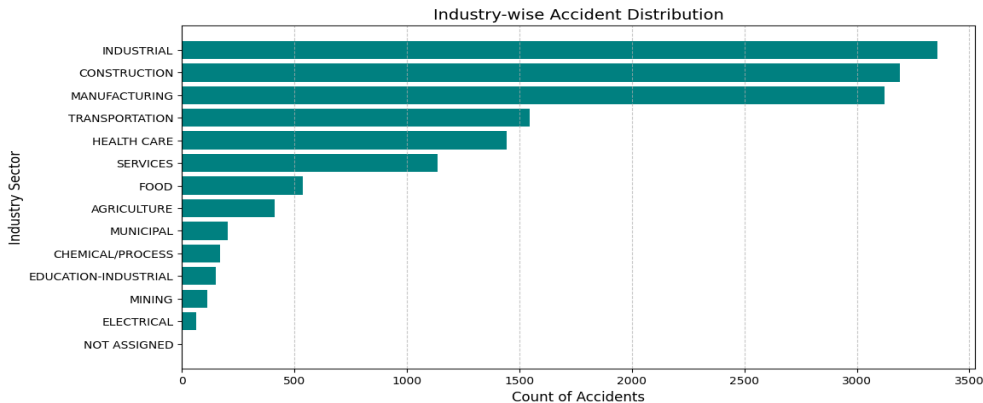
Comparison of Incidents by City and Municipalities of Ontario
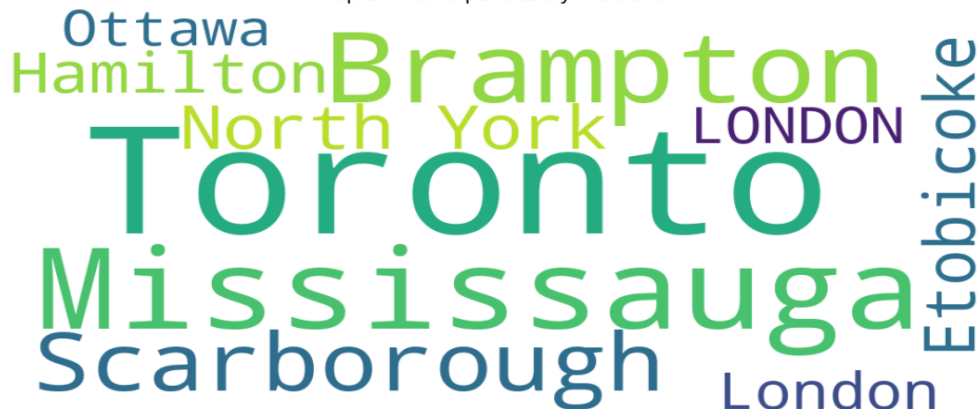
City-Wise Accident Hotspots 🏙️ 🔴

Word Cloud of City-Wise Accidents with Frequencies
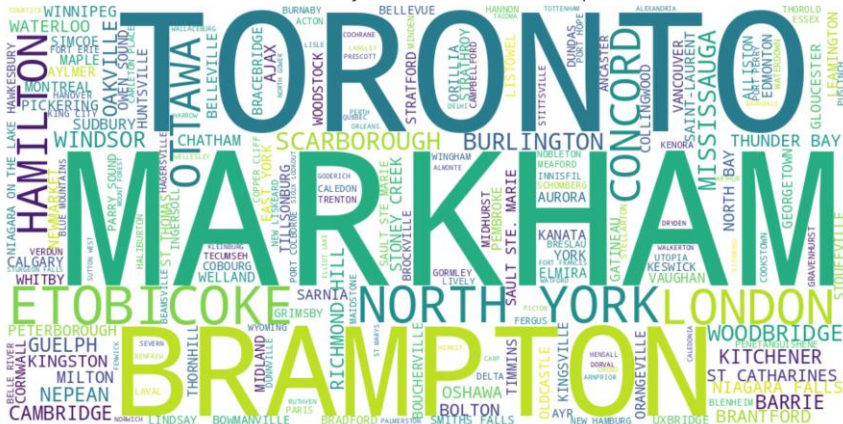
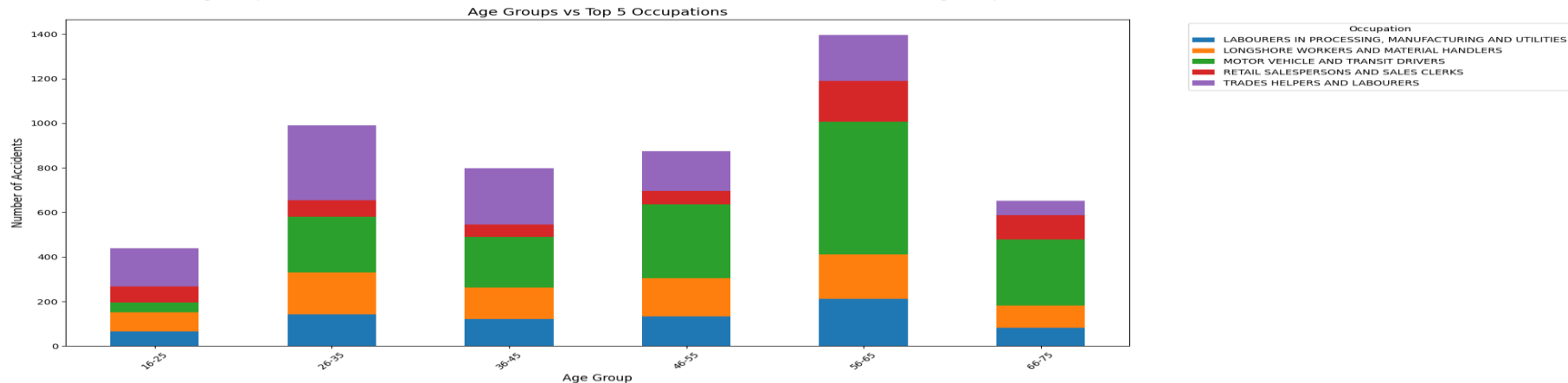| City	Accident_Count
MARKHAM	1469
TORONTO	1058
BRAMPTON	546
ETOBICOKE	528

⚠️ Incidents Hotspot By Top Municipalities
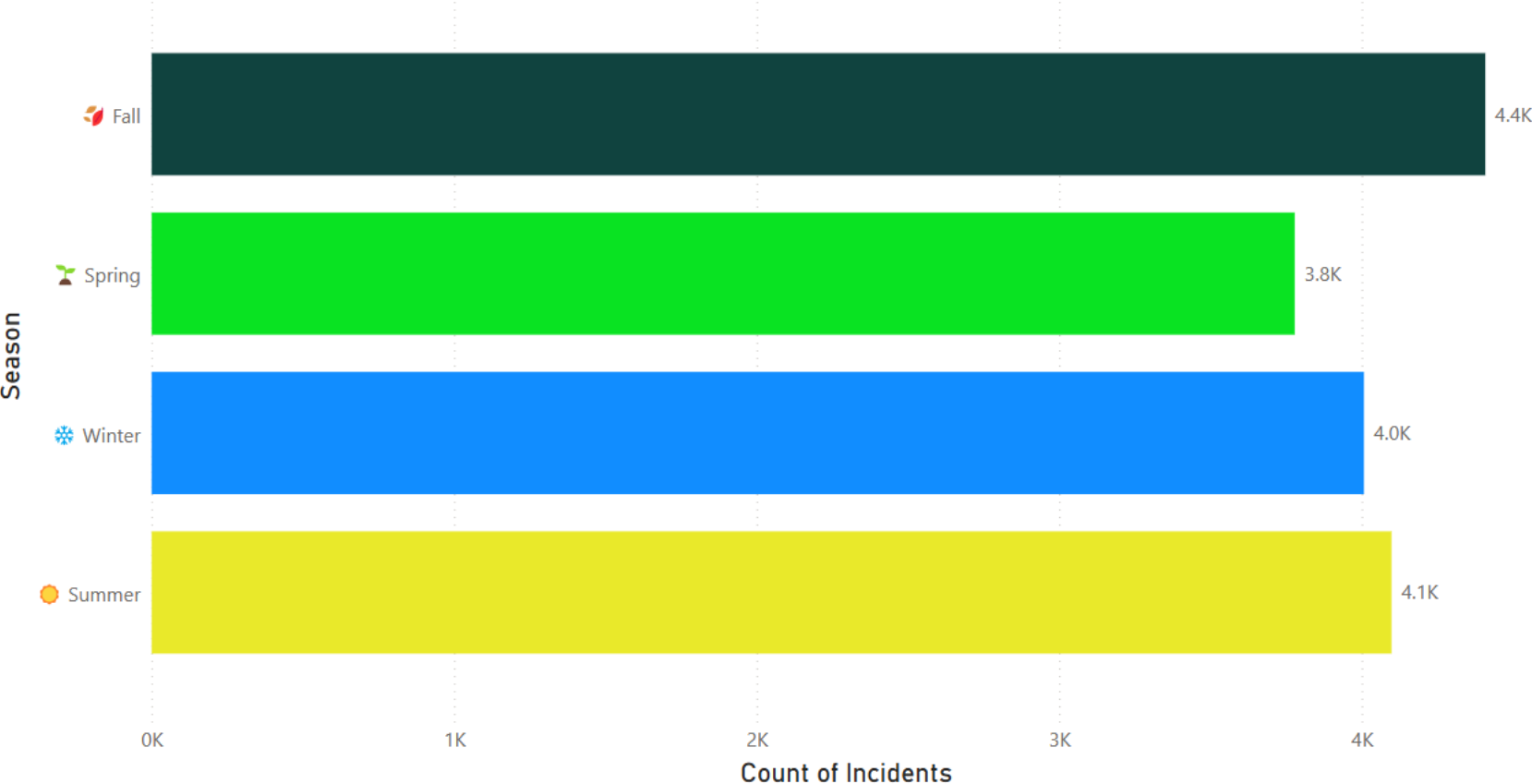

Top 10 Municipalities By Incident

City	Incident_Count
TORONTO	1688
MISSISSAUGA	865
BRAMPTON	638
SCARBOROUGH	411

Demographic Overview of Safety Incidents
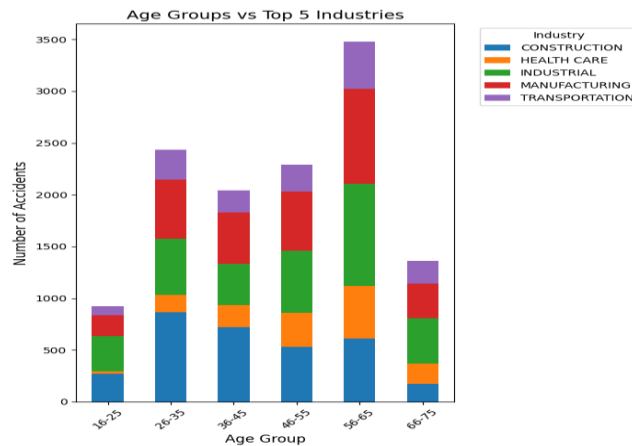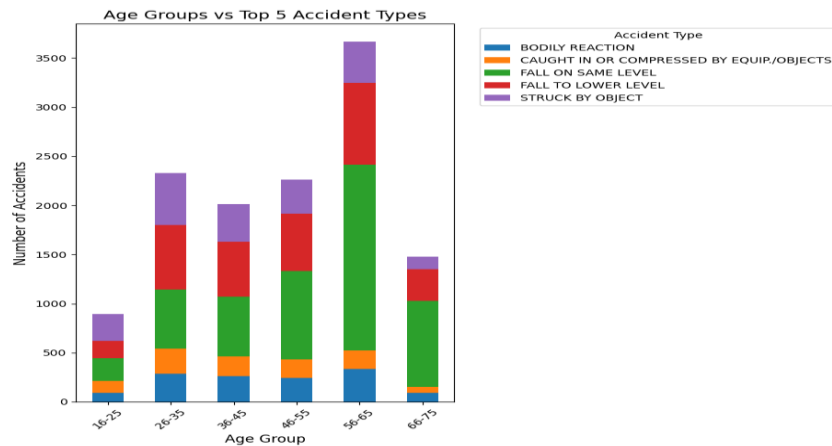
Correlation of Workplace Incidents with Seasons

Envisioning a safer future for Ontario workplaces

Incident Factors	Key Insights	Recommendations
❑ High-risk industries: Industrial, Construction, Manufacturing ❑ Top causes: Falls, struck-by, overexertion ❑ Most affected: Drivers, laborers, material handlers. ❑ High-risk cities: Toronto, Markham, Brampton ❑ Fall & Winter have peak accidents ❑ Manual labor-intensive jobs have higher injury rates.	❑ Falls & struck-by dominate. ❑ Workers 46-55 at highest risk. ❑ Education, Retail, Healthcare also affected. ❑ Accidents peaked in 2023, dropped in 2024. ❑ Urban areas report more cases. ❑ Preventable accidents make up a significant portion of reports.	❑ Stronger safety rules. ❑ Better fall prevention. ❑ Seasonal safety plans. ❑ Better training for high-risk jobs. ❑ Increase workplace safety awareness campaigns. ❑ Stricter enforcement of workplace safety laws. ❑ Frequent safety audits. ❑ AI and Data-Driven Solutions.