

1746 Data Scientist

Business Intelligence & Data Analytics

Take Home Exercise

Introduction

This exercise is to be done by you alone, using any combination of tools, data and related content that is appropriately licensed. Your presentation will be reviewed by a panel at York Regional Police. If selected to move forward, you will be asked to present/demonstrate your solution at an in-person interview. Interview questions from the panel will occur immediately after the presentation.

Jupyter Notebook is an example of free software that is available online that can be used for your application.

Please export your results to a PowerPoint slide deck or pdf document for submission.

Scenario

The Deputy Chief of the Community Safety Branch is looking to understand future crime trends and police staffing requirements in York Region. They have asked the Business Intelligence & Data Analytics Bureau to help. The audience for your solution is:

1. The Deputy Chief of the Community Safety Branch looking to better understand the locations in York Region that are the highest risk for increases in criminal activity or public safety concerns.

Your submission for this problem must include:

- A crime forecast for York Region and a one of its Police Districts
 - Identify the District most at risk of crime increase and why
 - Integrate a publicly available dataset not provided to you into your crime forecast model. Be creative and think of external factors that could impact crime.

2. 4 District Command (in charge of 4 District Police Station in Vaughan) is looking to understand projected calls for service trends in their District and the impacts on front line staffing.

Your submission for this problem must include:

- A forecast of future scheduling challenges for 4 District
 - What days of the year might have the most officers off and do those days coincide with days that have high call demands?
 - Consider scheduling data provided for 4 District
 - Consider calls for service demand in 4 District
 - Consider historical crime in 4 District

Resources

York Regional Police has a publicly available open data portal (Community Safety Data Portal) that can be used to download crime data from 2020 - to date

Please use Reported Date (rep_date) when analyzing crime data

Provided Data

4 District front line platoons work exception codes (dates and number of hours that officers are off work for vacation, sick, training time etc). Officers work four consecutive 12-hour shifts (two daytime shifts followed by two night time shifts), and then have four days off

The minimum staffing number for 4 District is 23 officers per shift.

Incorporate other publicly available data set(s) that could have an impact on public safety or officer schedules and availability.

A demonstration of your solution should take no longer than 20 minutes