Our proposed new FP Growth Algorithm is used to mine the chosen Canada COVID-19 case details database after reducing some unnecessary information like ObjectId, latitude, longitude, etc. The mining for most vulnerable group is done in two parts; one is to mine and compare with results from every month starting on the 1st, and the other is to compare with results mined for each province.

Mining for different periods of time is performed for the entire database and sub databases of case\_status being Deceased, exposure being Close Contact, and exposure being Travel-Related in order to mine different representations of most vulnerable group formed by age and gender. The age and gender group with highest support is chosen to be the most vulnerable group. Minimum support of 3% is chosen to mine the entire database as this will ensure each month have a frequent 2-itemset where the most frequent age and gender group only takes up 3.28% for May, and minimum support of 5% is used to mine the sub databases. The results for January and February are excluded as COVID-19 just started around that time in Canada and the number of cases, 9 for January and 58 for February are not big enough to contribute to our discussions.

Mining for different provinces is performed by taking the “age\_group”, “gender”, and “province” columns from the database. We set the minimum support to 10 as this gives us a better result among other number of supports. When mining the most vulnerable age group within each province, we find all frequent 2-itemset and its count containing both age-group and province, and the age group with the largest count is the most vulnerable group for each province. When mining the most vulnerable age group including gender within each province, we find all frequent 3-itemset and its count containing age-group, province and gender, and the most vulnerable group is the age group with the largest count recorded separately for male and female. For the most vulnerable group with gender, the following 3 provinces/territories: Prince Edward Island, New Brunswick, and Newfoundland and Labrador do not have enough cases or only have one gender for all its cases, therefore are excluded from the result to avoid any biased conclusion.