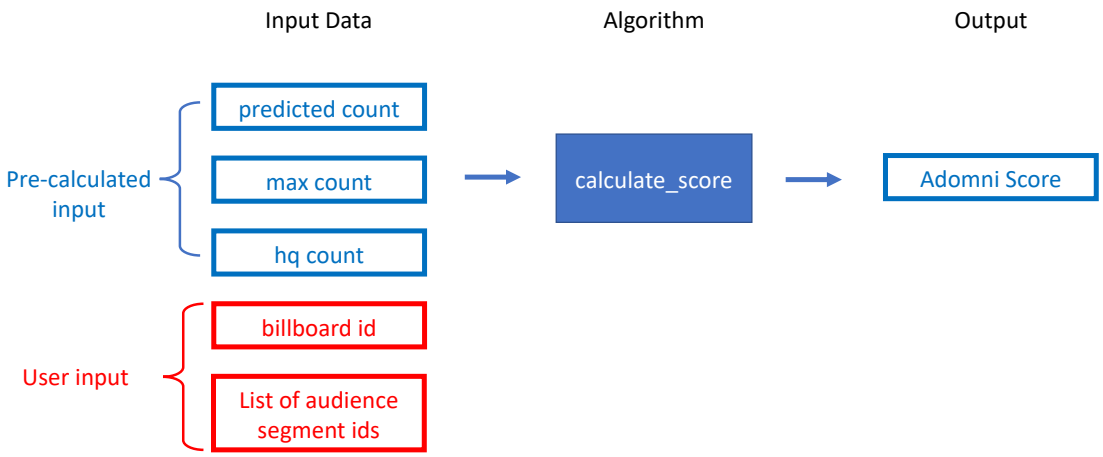
November 10, 2019
Kei Fukutani

1. Algorithm input and output

The algorithm takes as input **predicted count**, **max count** and **hq count** from pre-calculated data. The algorithm also takes as input **billboard id** and a **list of audience segment ids** from user input.

The algorithm outputs **Adomni Score**.



2. Data

• Pre-calculated input
predicted count: Count of mobile devices for specific billboard and audience segment
max count: Max count of mobile devices for each audience segment among all of the billboards
hq count: Count of mobile devices for each billboard, which fit all of the three audience segments (age, gender, and any other one of audience segments)

	Approximate number of rows	Columns
predicted count	150K * 800	billboard_id, aud_id, count
max count	800	aud_id, count
hq count	150K * 9 * 2 * 800	billboard_id, aud_id1, aud_id2, aud_id3, count

1) Assuming the number of billboards is 150K and the number of audience segments is 800.
2) The number of age range is 9.

• User input
User inputs **billboard id** and a **list of audience segment ids**.

• Output
Adomni Score: The algorithm returns type double number in the range of 0 to 1.

3. Algorithm Flow

The algorithm calculates normalized score for 1) specific audience, 2) any audience, and 3) high quality mobile devices. Then, it sums up them and divides it by three. Then, it returns the value as Adomni Score.

1) To calculate the normalized score for specific audiences, the algorithm first gets the predicted count for the given **billboard id** and **audience segment id** from **predicted count**. And it also gets the max count for the **audience segment id** from **max count**. Then it divides the predicted count by the max count. Then it takes the average of all the normalized scores for the given **audience segment ids**.
2) To calculate the normalized score for any audience, the algorithm first gets the predicted count for the given **billboard id** from **predicted count**. And also, it gets the max count among all of the billboards from **predicted count**. Then it divides the predicted count by the max count.
3) To calculate the normalized score for high quality mobile devices, the algorithm first gets the count for the given **billboard id** and the given **audience segment ids** from **hq count**. And it also gets the max count for the given **audience segment ids** from **hq count**. Then it divides the count by the max count.