Product Pricing Algorithm

Business Science

3/19/2019

Problem Statement

Research and Development wants help to determine new product ideas and pricing using existing product line as a benchmark.

Solution Summary

We've identified several product gaps in the existing product line including:

1. Aluminum Over Mountain
2. Aluminum Triathalon

The Data Science Team has developed a pricing model that uses predictive analytics to estimate the price of the new bicycle models based on the existing fleet. This ensures that new models are priced comparatively to other similar bicycles.

New product prediction for 2 new models:

1. Trigger, Over Mountain with Aluminum Frame: $2,273
2. Slice, Triathalon with Aluminum Frame: $1,902

Gap Analysis

Bike List

The current portfolio consits of 97 different bikes that were analyzed.

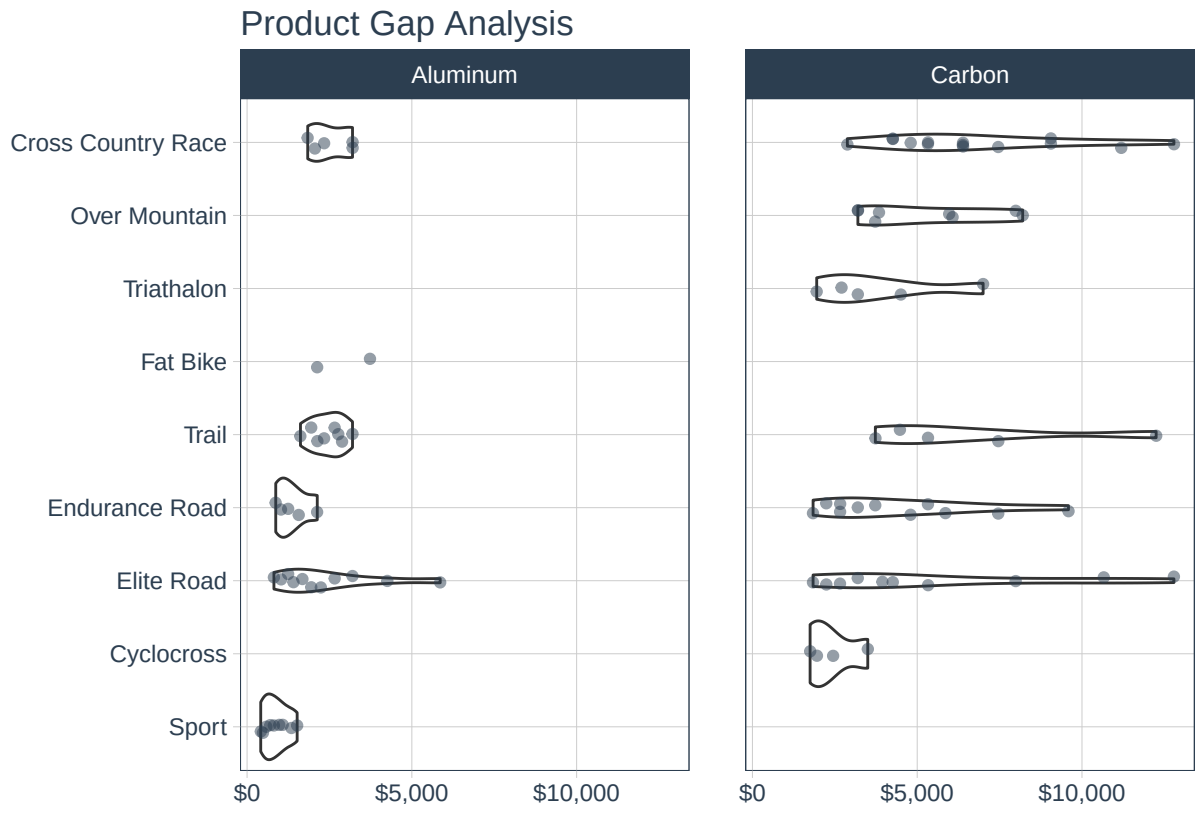
```
## # A tibble: 97 x 15
##       id price model category_1 category_2 frame_material model_base model_tier
##    <int> <dbl> <chr> <chr>      <chr>      <chr>          <chr>      <chr>
##  1     1  6070 Jeky~ Mountain   Over Moun~ Carbon         Jekyll     Carbon 2
##  2     2  5970 Trig~ Mountain   Over Moun~ Carbon         Trigger    Carbon 2
##  3     3  2770 Beas~ Mountain   Trail      Aluminum       Beast of ~ 1
##  4     4 10660 Supe~ Road       Elite Road Carbon         Supersix ~ Hi-Mod Te~
##  5     5  3200 Jeky~ Mountain   Over Moun~ Carbon         Jekyll     Carbon 4
##  6     6 12790 Supe~ Road       Elite Road Carbon         Supersix ~ Black Inc.
##  7     7  5330 Supe~ Road       Elite Road Carbon         Supersix ~ Hi-Mod Du~
##  8     8  1570 Syna~ Road       Endurance~ Aluminum       Synapse    Disc 105
```

```
##  9     9  4800 Syna~ Road       Endurance~ Carbon         Synapse    Carbon Di~
## 10    10   480 Cata~ Mountain   Sport      Aluminum       Catalyst   3
## # ... with 87 more rows, and 7 more variables: black <dbl>, hi_mod <dbl>,
## #   team <dbl>, red <dbl>, ultegra <dbl>, dura_ace <dbl>, disc <dbl>
```

Gaps

The visualization segments the full bicycle product line by category and frame material. This exposes two product gaps:

1. New **Aluminum** line of bikes in the **Over Mountain Category**
2. New **Aluminum** line of bikes in the **Triathalon**



Price Prediction

New product prediction for 2 new models:

1. Trigger, Over Mountain with Aluminum Frame: $2,273
2. Slice, Triathalon with Aluminum Frame: $1,902

```
## [10:32:07] WARNING: amalgamation/../src/objective/regression_obj.cu:167: reg:linear is now deprecate
## [10:32:07] WARNING: amalgamation/../src/learner.cc:556: Loading model from XGBoost < 1.0.0, consider
```

New Model Attribute	Slice Al 1	Trigger Al 1
.pred	$1,902	$2,273
frame_material	Aluminum	Aluminum
category_2	Triathalon	Over Mountain
model_base	Slice	Trigger
model_tier	Ultegra	Aluminum 1
black	0	0
hi_mod	0	0
team	0	0
red	0	0
ultegra	0	0
dura_ace	0	0
disc	0	0