Exercise 1
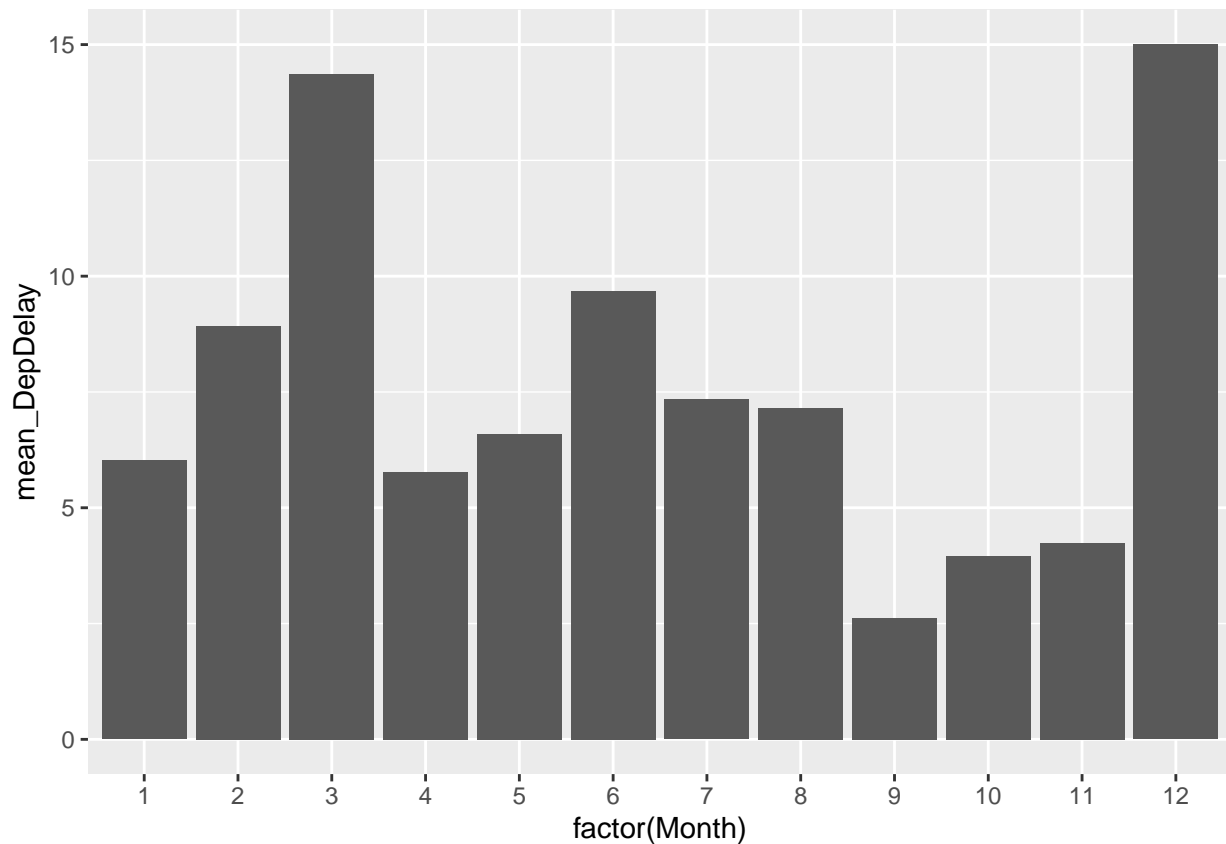
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Question1 - Flights at ABIA

Question a: What's the best time of year to fly to minimize delays?


Question b: Does the best time to fly to min delays change by destination?

```
##     Dest  freq
## 1    ABQ   435
## 2    ATL  2252
## 3    AUS 49637
## 4    BNA   792
## 5    BOS   368
## 6    BWI   730
## 7    CLE   380
## 8    CLT   659
## 9    CVG   653
## 10   DAL  5573
## 11   DEN  2673
```

```
## 12   DFW   5506
## 13   DSM      1
## 14   DTW      1
## 15   ELP   1349
## 16   EWR    949
## 17   FLL    481
## 18   HOU   2319
## 19   HRL    367
## 20   IAD    670
## 21   IAH   3691
## 22   IND    218
## 23   JAX    226
## 24   JFK   1358
## 25   LAS   1231
## 26   LAX   1733
## 27   LBB    692
## 28   LGB    245
## 29   MAF    470
## 30   MCI    459
## 31   MCO    632
## 32   MDW    712
## 33   MEM    834
## 34   MSP     55
## 35   MSY    444
## 36   OAK    236
## 37   OKC     88
## 38   ONT    305
## 39   ORD   2514
## 40   ORF      1
## 41   PHL    290
## 42   PHX   2783
## 43   RDU    231
## 44   SAN    719
## 45   SEA    149
## 46   SFO    610
## 47   SJC    968
## 48   SLC    548
## 49   SNA    245
## 50   STL     95
## 51   TPA    367
## 52   TUL     88
## 53   TUS    228
```

Top 10 popular destinations
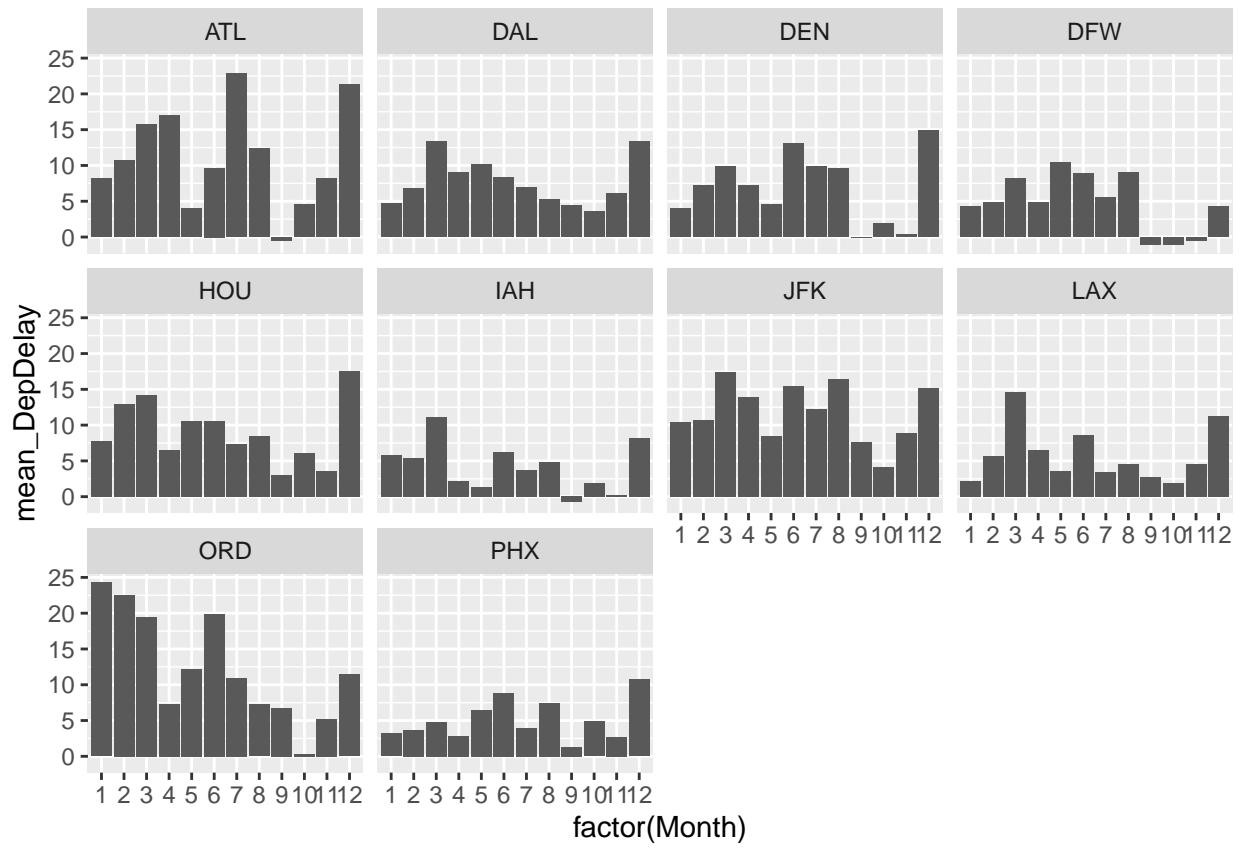
2) Wrangling the Olympics

(2.A) What is the 95th percentile of heights for female competitors across all Athletics events

95th percentile of heights for female competitors across all Athletics events is 186.

(2.B) Which single women's event had the greatest variability in competitor's heights across the entire history of the Olympics, as measured by the standard deviation?

Rowing Women's Coxed Fours has the greatest variability, with standard derivation equals to 10.9

(2.C) How has the average age of Olympic swimmers changed over time? Does the trend look different for male swimmers relative to female swimmers?

The trend between female and male swimmers is different before around 1935,where age of male swimmers decreases and then increases, and then decreases, and age of female swimmers slightly increases.

After 1950, age of all swimmers has an increasing trend.
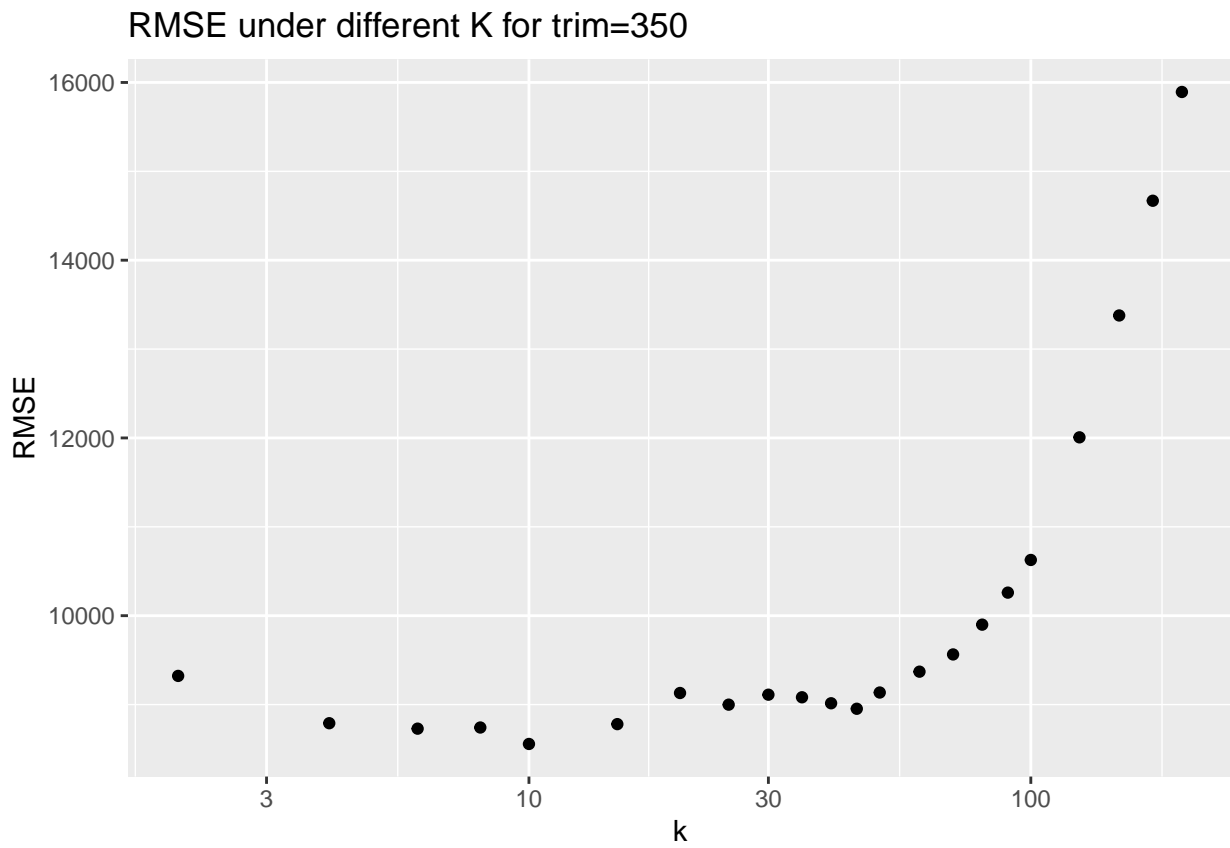
Total swimmer average age change
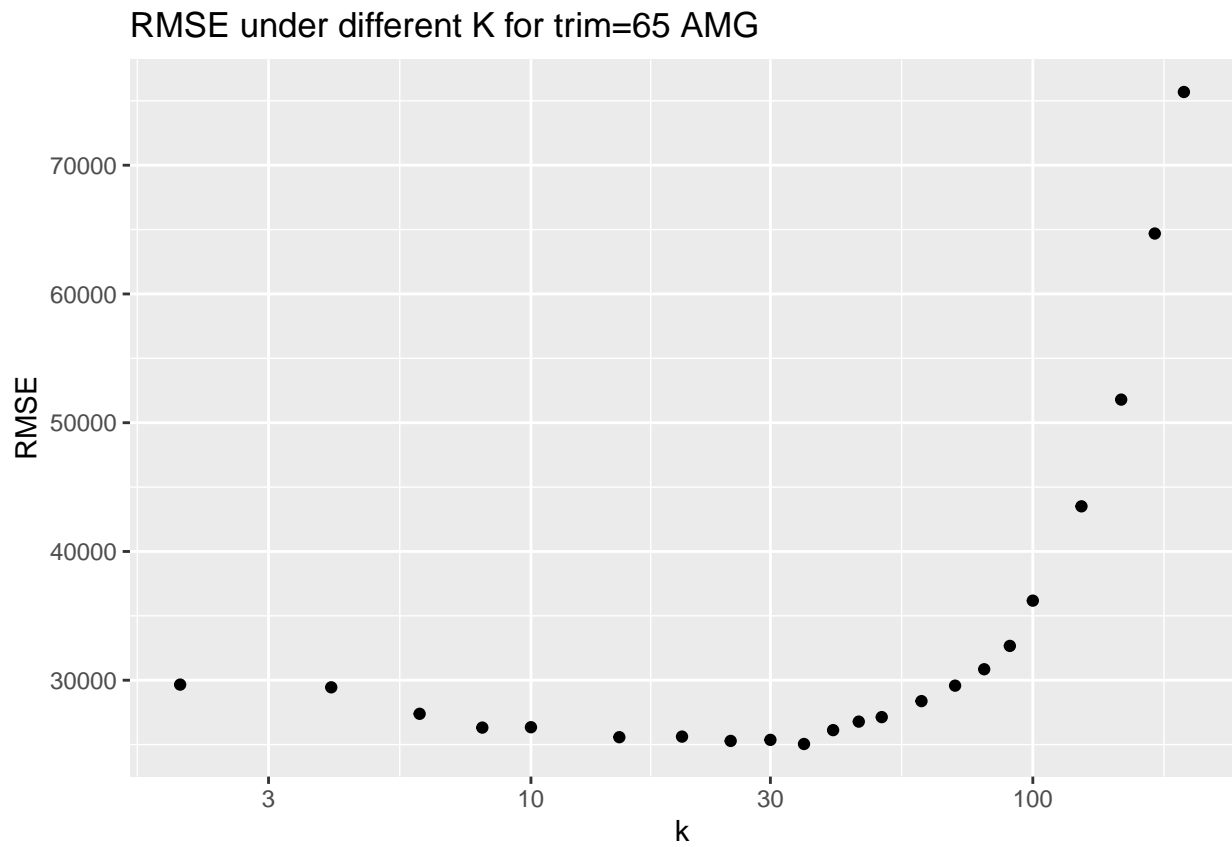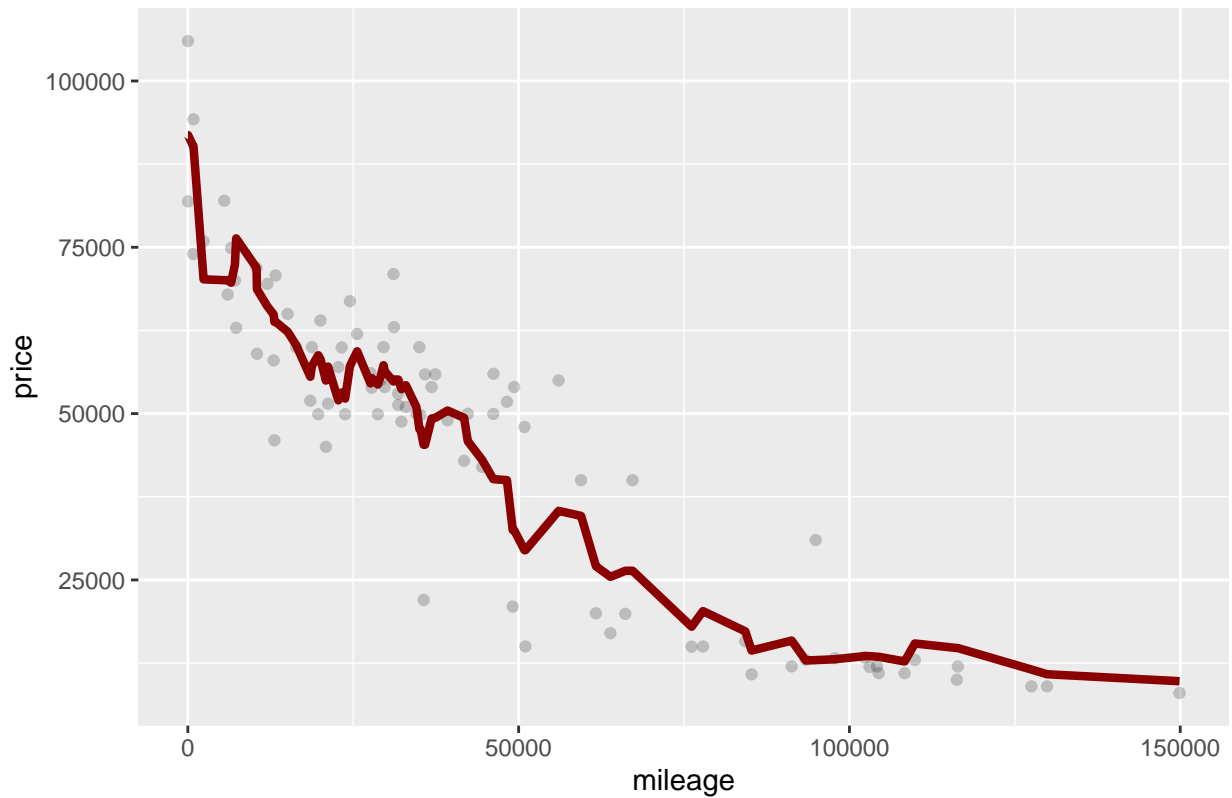

Swimmer average height change

Question 3

RMSE under different K for trim=350
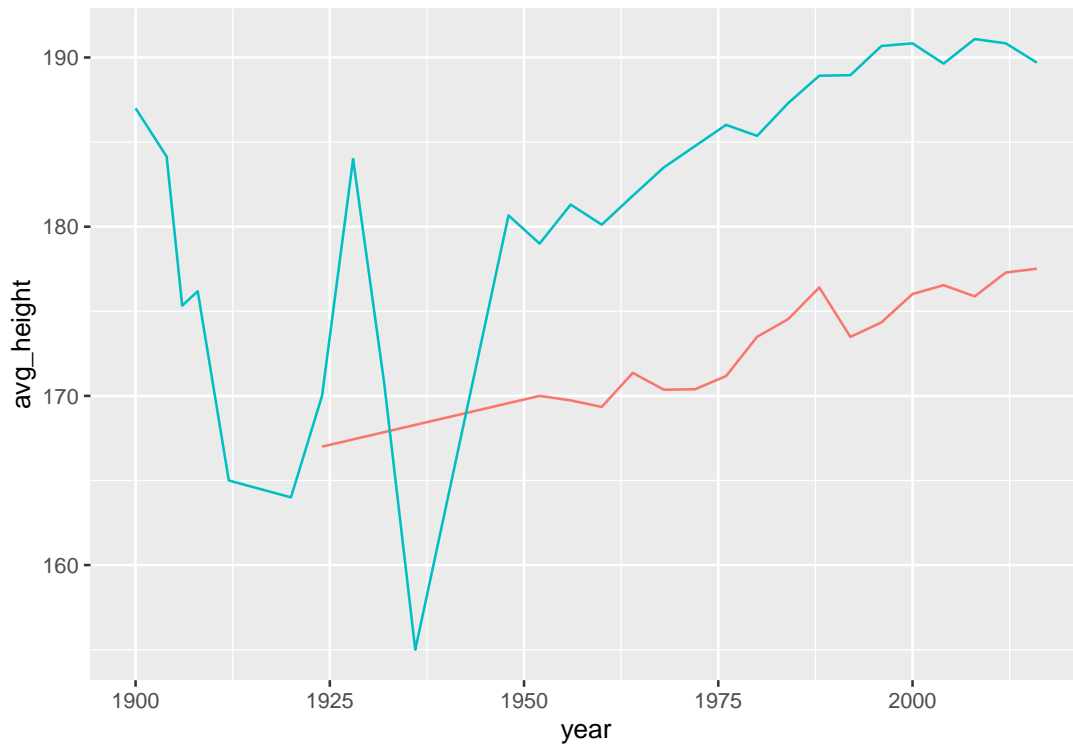
From the above plot, when k = 10, we can get the minimal RMSE.
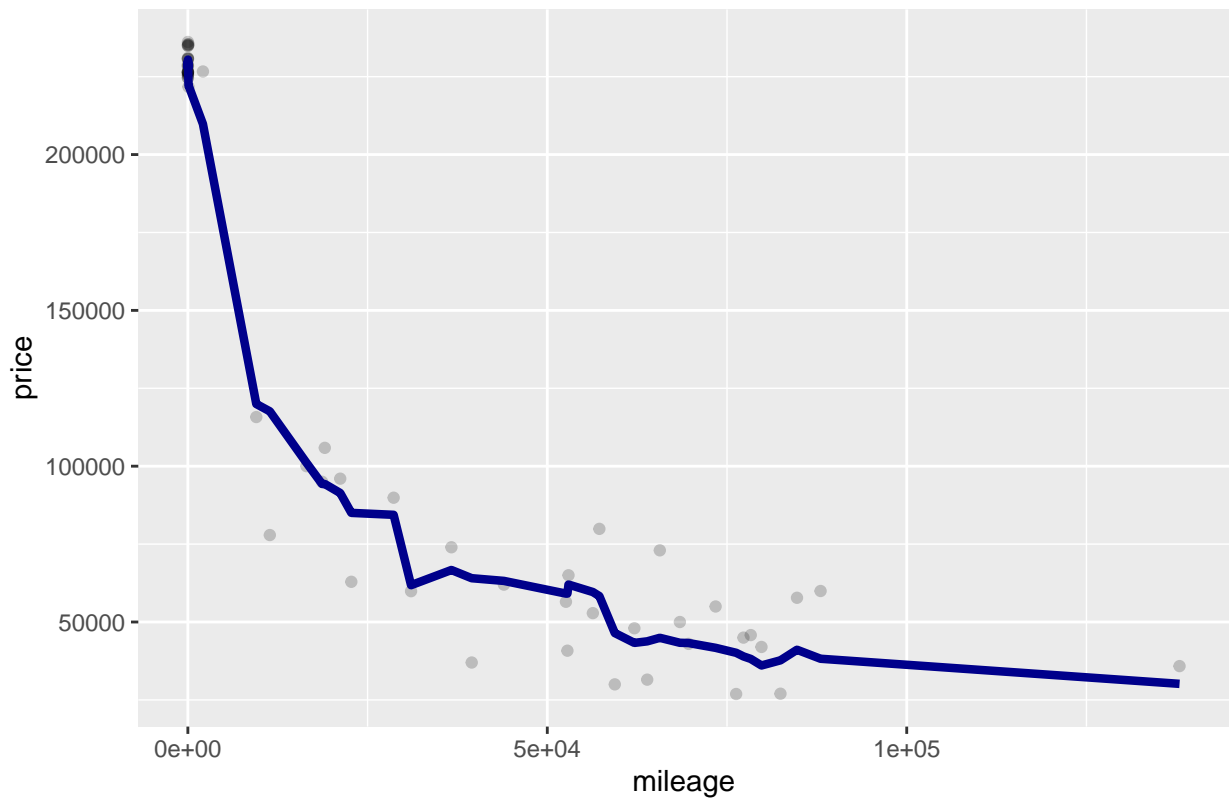
RMSE under different K for trim=65 AMG

From the above plot, when k = 35, we can get the minimal RMSE.

Predict value for trim=350

Predict value for trim = 65 AMG

From the above two plots, under the same mileage, trim = 65AMG has a higher value. This may because

people have a preference for trim 65AMG or people have a higher demand for this sub-model.

The reason why trim 65 AMG has a greater optimal K, I think it's because the variation under this model is lower.