FBI-Fashion Business Intelligence

Objectives

- Predict the shelf life and further analysis on shelf life reduction
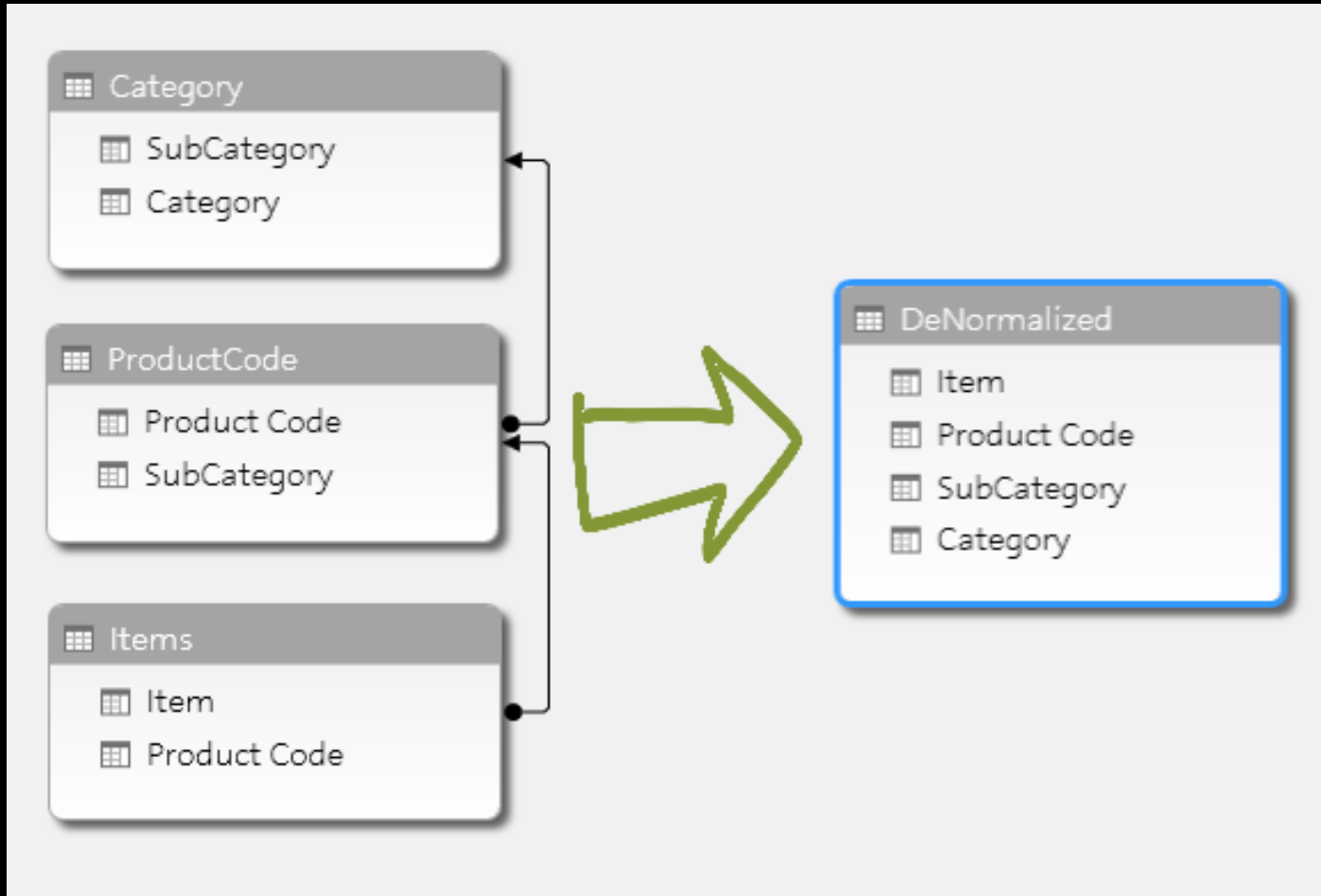
- Price analysis

Challenges

- Data Gathering

- Data Analysis

- Domain knowledge

- ETL tasks
  - Cleaning
  - Merging

Data

- Tabular SQL form
  - Highly normalized

- Real world retail data
  - Items Details
  - Transactions

Feature Engineering and ETL

Feature Engineering and ETL

- Items Denormalized using 10 tables
  - Category, Class, Sub Class, Unit, Size, Colour, Source, Vendor, Group, Type

	ItemCode	DesignCode	CategoryName	ClassName	SubClassName	ItemName	UnitName	SizeName	ColorName	SourceName	VendorName	GroupName	TypeName	SalePrice
1	17	X3297	Suit 03 Piece	Bombo Slub	Bombo Slub Shirt + Bombo Dupatta	Bombo Slub + Bombo Dupatta 3 Piece Suit	PCS	Standard	Multi-Color	Production	Ali Embroidery	Ladies Fabric	Fancy	1920
2	18	X2866	Suit 03 Piece	Bombo Slub	Bombo Slub Shirt + Bombo Dupatta	Bombo Slub + Bombo Dupatta 3 Piece Suit	PCS	Standard	Multi-Color	Production	Ali Embroidery	Ladies Fabric	Fancy	1920
3	19	X3275	Suit 03 Piece	Bombo Slub	Bombo Slub Shirt + Bombo Dupatta	Bombo Slub + Bombo Dupatta 3 Piece Suit	PCS	Standard	Multi-Color	Production	Ali Embroidery	Ladies Fabric	Fancy	1920
4	20	X3266	Suit 03 Piece	Bombo Slub	Bombo Slub Shirt + Bombo Dupatta	Bombo Slub + Bombo Dupatta 3 Piece Suit	PCS	Standard	Multi-Color	Production	Ali Embroidery	Ladies Fabric	Fancy	1920
5	21	X3267	Suit 03 Piece	Bombo Slub	Bombo Slub Shirt + Bombo Dupatta	Bombo Slub + Bombo Dupatta 3 Piece Suit	PCS	Standard	Multi-Color	Production	Ali Embroidery	Ladies Fabric	Fancy	1920
6	22	X3268	Suit 03 Piece	Bombo Slub	Bombo Slub Shirt + Bombo Dupatta	Bombo Slub + Bombo Dupatta 3 Piece Suit	PCS	Standard	Multi-Color	Production	Ali Embroidery	Ladies Fabric	Fancy	1920
7	23	X3260	Suit 03 Piece	Bombo Slub	Bombo Slub Shirt + Bombo Dupatta	Bombo Slub + Bombo Dupatta 3 Piece Suit	PCS	Standard	Multi-Color	Production	Ali Embroidery	Ladies Fabric	Fancy	1920
8	24	X3273	Suit 03 Piece	Bombo Slub	Bombo Slub Shirt + Bombo Dupatta	Bombo Slub + Bombo Dupatta 3 Piece Suit	PCS	Standard	Multi-Color	Production	Ali Embroidery	Ladies Fabric	Fancy	1920
9	25	X3271	Suit 03 Piece	Bombo Slub	Bombo Slub Shirt + Bombo Dupatta	Bombo Slub + Bombo Dupatta 3 Piece Suit	PCS	Standard	Multi-Color	Production	Ali Embroidery	Ladies Fabric	Fancy	1920
10	26	X3274	Suit 03 Piece	Bombo Slub	Bombo Slub Shirt + Bombo Dupatta	Bombo Slub + Bombo Dupatta 3 Piece Suit	PCS	Standard	Multi-Color	Production	Ali Embroidery	Ladies Fabric	Fancy	1920
11	27	X3261	Suit 03 Piece	Bombo Slub	Bombo Slub Shirt + Bombo Dupatta	Bombo Slub + Bombo Dupatta 3 Piece Suit	PCS	Standard	Multi-Color	Production	Ali Embroidery	Ladies Fabric	Fancy	1920
12	28	X3254	Suit 03 Piece	Bombo Slub	Bombo Slub Shirt + Bombo Dupatta	Bombo Slub + Bombo Dupatta 3 Piece Suit	PCS	Standard	Multi-Color	Production	Ali Embroidery	Ladies Fabric	Fancy	1920
13	29	X3272	Suit 03 Piece	Bombo Slub	Bombo Slub Shirt + Bombo Dupatta	Bombo Slub + Bombo Dupatta 3 Piece Suit	PCS	Standard	Multi-Color	Production	Ali Embroidery	Ladies Fabric	Fancy	1920
14	1	X3296	Suit 03 Piece	Bombo Slub	Bombo Slub Shirt + Bombo Dupatta	Bombo Slub + Bombo Dupatta 3 Piece Suit	PCS	Standard	Multi-Color	Production	Ali Embroidery	Ladies Fabric	Fancy	1920
15	205	X3267	Suit 03 Piece	Bombo Slub	Bombo Slub Shirt + Bombo Dupatta	Cotton Bamboo Slub Shirt + Self Dupatta 2	PCS	Standard	Multi-Color	Production	Ali Embroidery	Ladies Fabric	Casual	1920

Feature Engineering and ETL

- Item stock track new feature which was constructed using 14 tables like sale, shop in, out, return, exchange received and remarks etc.

	id	ItemCode	Date	StockQty	SaleQty	Discount	SalePrice	ShopOut	ShopIn	SaleExchange	ReturnToShop	ReturnFromShop	ReceiveAtShop	StockOpening	ShopCode
33	33	1460	2018-03-06 00:00:00.0000000	12	0	NULL	2632	0	2	0	0	0	0	0	2
34	34	1461	2018-03-06 00:00:00.0000000	9	0	NULL	2632	0	2	0	0	0	0	0	2
35	35	1452	2018-03-06 00:00:00.0000000	25	0	NULL	2632	0	5	0	0	0	0	0	2
36	36	1887	2018-03-06 00:00:00.0000000	35	0	NULL	2400	0	5	0	0	0	0	0	2
37	37	1875	2018-03-06 00:00:00.0000000	71	0	NULL	2400	0	10	0	0	0	0	0	2
38	38	1867	2018-03-06 00:00:00.0000000	56	0	NULL	2960	0	5	0	0	0	0	0	2
39	39	1909	2018-03-06 00:00:00.0000000	62	0	NULL	3450	0	10	0	0	0	0	0	2
40	40	1873	2018-03-06 00:00:00.0000000	23	0	NULL	2400	0	5	0	0	0	0	0	2
41	41	1882	2018-03-06 00:00:00.0000000	26	0	NULL	2400	0	5	0	0	0	0	0	2
42	42	1912	2018-03-06 00:00:00.0000000	26	0	NULL	3450	0	2	0	0	0	0	0	2
43	43	1911	2018-03-06 00:00:00.0000000	25	0	NULL	3450	0	2	0	0	0	0	0	2
44	44	1329	2018-03-30 00:00:00.0000000	6	0	NULL	2632	0	3	0	0	0	0	0	2
45	45	1452	2018-03-30 00:00:00.0000000	37	0	NULL	2632	0	12	0	0	0	0	0	2
46	46	1453	2018-03-30 00:00:00.0000000	5	0	NULL	2632	0	2	0	0	0	0	0	2

Feature Engineering and ETL

- Shelf Life using stock track (with intervals and shops)
- shop Wise Shelf Life
- Items shelf life (independent of shop or intervals)

|	ShopCode	shlefLife	ItemCode	DesignCode	CategoryName	ClassName	SubClassName	ItemName	UnitName	SizeName	ColorName	SourceName	VendorName
78	3	0.00985221657902...	70	X3084	Suit 03 Piece	Peach Le...	Peach Leather Shirt + Peach Lea...	Peach Leather Shirt + Peach Leather Du...	PCS	Standard	Multi-Color	Production	Ali Embroidery
79	3	0.00881057232618...	71	X3072	Suit 03 Piece	Peach Le...	Peach Leather Shirt + Peach Lea...	Peach Leather Shirt + Peach Leather Du...	PCS	Standard	Multi-Color	Production	Ali Embroidery
80	3	0.00282485876232...	72	X3134	Suit 03 Piece	Peach Le...	Peach Leather Shirt + Peach Lea...	Peach Leather Shirt + Peach Leather Du...	PCS	Standard	Multi-Color	Production	Ali Embroidery
81	2	0.0459770113229752	72	X3134	Suit 03 Piece	Peach Le...	Peach Leather Shirt + Peach Lea...	Peach Leather Shirt + Peach Leather Du...	PCS	Standard	Multi-Color	Production	Ali Embroidery
82	3	0.0097719868645072	73	X2992	Suit 03 Piece	Peach Le...	Peach Leather Shirt + Peach Lea...	Peach Leather Shirt + Peach Leather Du...	PCS	Standard	Multi-Color	Production	Ali Embroidery
83	3	0.00383141753263...	74	X3091	Suit 03 Piece	Peach Le...	Peach Leather Shirt + Peach Lea...	Peach Leather Shirt + Peach Leather Du...	PCS	Standard	Multi-Color	Production	Ali Embroidery
84	3	0.0906237233430147	75	X3018	Suit 03 Piece	Peach Le...	Peach Leather Shirt + Peach Lea...	Peach Leather Shirt + Peach Leather Du...	PCS	Standard	Multi-Color	Production	Ali Embroidery
85	2	0.065040647983551	75	X3018	Suit 03 Piece	Peach Le...	Peach Leather Shirt + Peach Lea...	Peach Leather Shirt + Peach Leather Du...	PCS	Standard	Multi-Color	Production	Ali Embroidery
86	3	0.00440528616309...	76	X3065	Suit 03 Piece	Peach Le...	Peach Leather Shirt + Peach Lea...	Peach Leather Shirt + Peach Leather Du...	PCS	Standard	Multi-Color	Production	Ali Embroidery
87	3	0.00689655169844...	77	X3079	Suit 03 Piece	Peach Le...	Peach Leather Shirt + Peach Lea...	Peach Leather Shirt + Peach Leather Du...	PCS	Standard	Multi-Color	Production	Ali Embroidery
88	4	0.136363640427589	78	PLAIN	Suit 03 Piece	Peach Le...	Peach Leather Shirt + Peach Lea...	Peach Leather Shirt + Peach Leather Du...	PCS	Standard	Multi-Color	Production	Ali Embroidery
89	2	0.619047626852989	78	PLAIN	Suit 03 Piece	Peach Le...	Peach Leather Shirt + Peach Lea...	Peach Leather Shirt + Peach Leather Du...	PCS	Standard	Multi-Color	Production	Ali Embroidery
90	NULL	NULL	79	PLAIN	Suit 03 Piece	Peach Le...	Peach Leather Shirt + Peach Lea...	Peach Leather Shirt + Peach Leather Du...	PCS	Standard	Multi-Color	Production	Ali Embroidery
91	NULL	NULL	80	PLAIN	Suit 03 Piece	Peach Le...	Peach Leather Shirt + Peach Lea...	Peach Leather Shirt + Peach Leather Du...	PCS	Standard	Multi-Color	Production	Ali Embroidery

Feature Engineering and ETL

- Season Constructed from Items Received at shop

ShopCode	ItemCode	VoucherNoRef	VoucherDate	VoucherLineNoRef	VoucherNo	VoucherLineNo	DesignCode	UnitCode	SizeCode	ColorCode	SalePrice	QtyDis	Q
2	274	17	2017-03-03 00:00:00.000	0001	1	0001	X2978	1	1	1	3070	12	1
2	275	17	2017-03-03 00:00:00.000	0002	1	0002	X2979	1	1	1	3070	12	1
2	276	17	2017-03-03 00:00:00.000	0003	1	0003	X2981	1	1	1	3070	12	1
2	277	17	2017-03-03 00:00:00.000	0004	1	0004	X3127	1	1	1	3070	10	1
2	278	17	2017-03-03 00:00:00.000	0005	1	0005	X2991	1	1	1	3070	12	1
2	279	17	2017-03-03 00:00:00.000	0006	1	0006	X2986	1	1	1	3070	12	1
2	280	17	2017-03-03 00:00:00.000	0007	1	0007	X2134	1	1	1	2380	10	1
2	281	17	2017-03-03 00:00:00.000	0008	1	0008	X2133	1	1	1	2380	12	1
2	282	17	2017-03-03 00:00:00.000	0009	1	0009	X2138	1	1	1	2380	12	1
2	205	18	2017-03-03 00:00:00.000	0001	2	0001	SPX3850D	1	1	1	3600	6	6

ItemCode	Season
1	Winter
2	Winter
3	Winter
4	Winter
5	Winter
6	Winter
7	Winter
8	Winter
9	Winter
16	Winter

EDA-Category wise average price
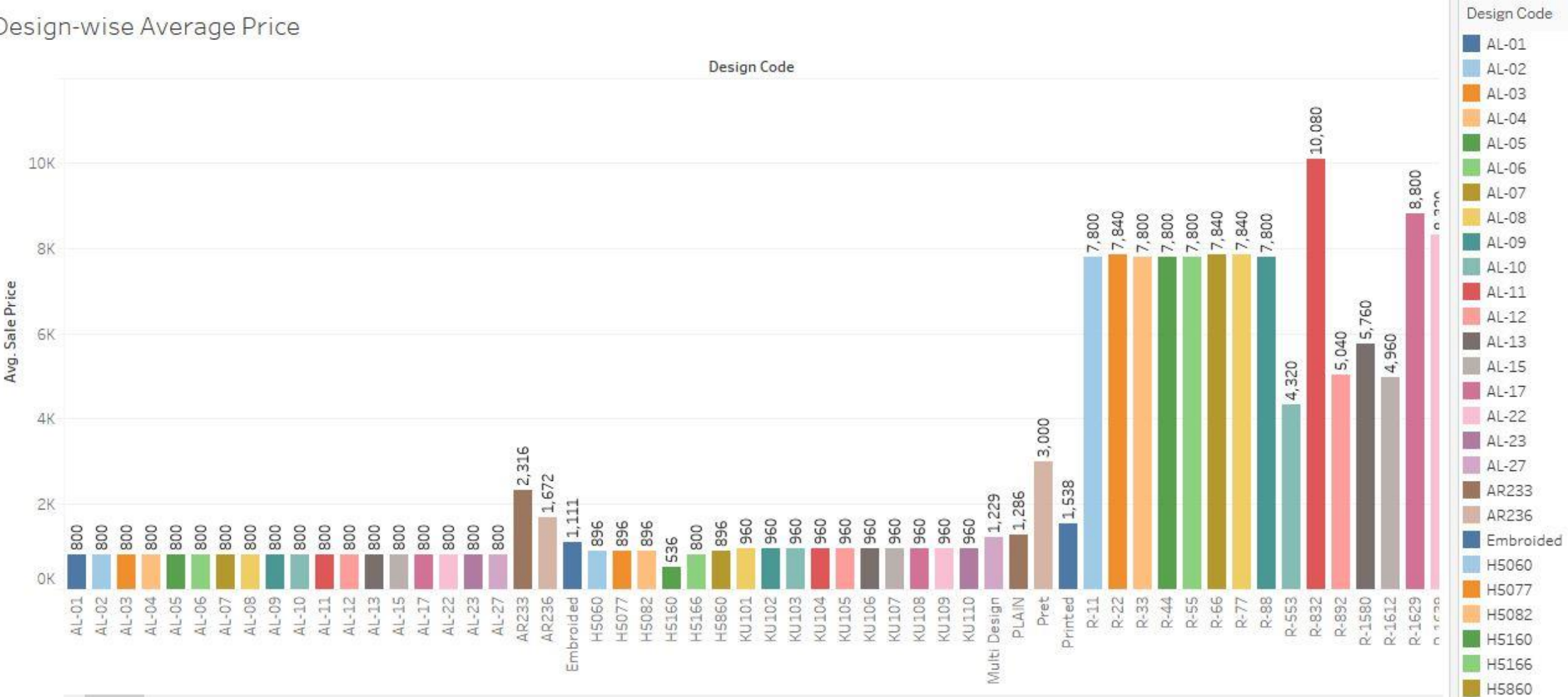

Category-wise Average Price
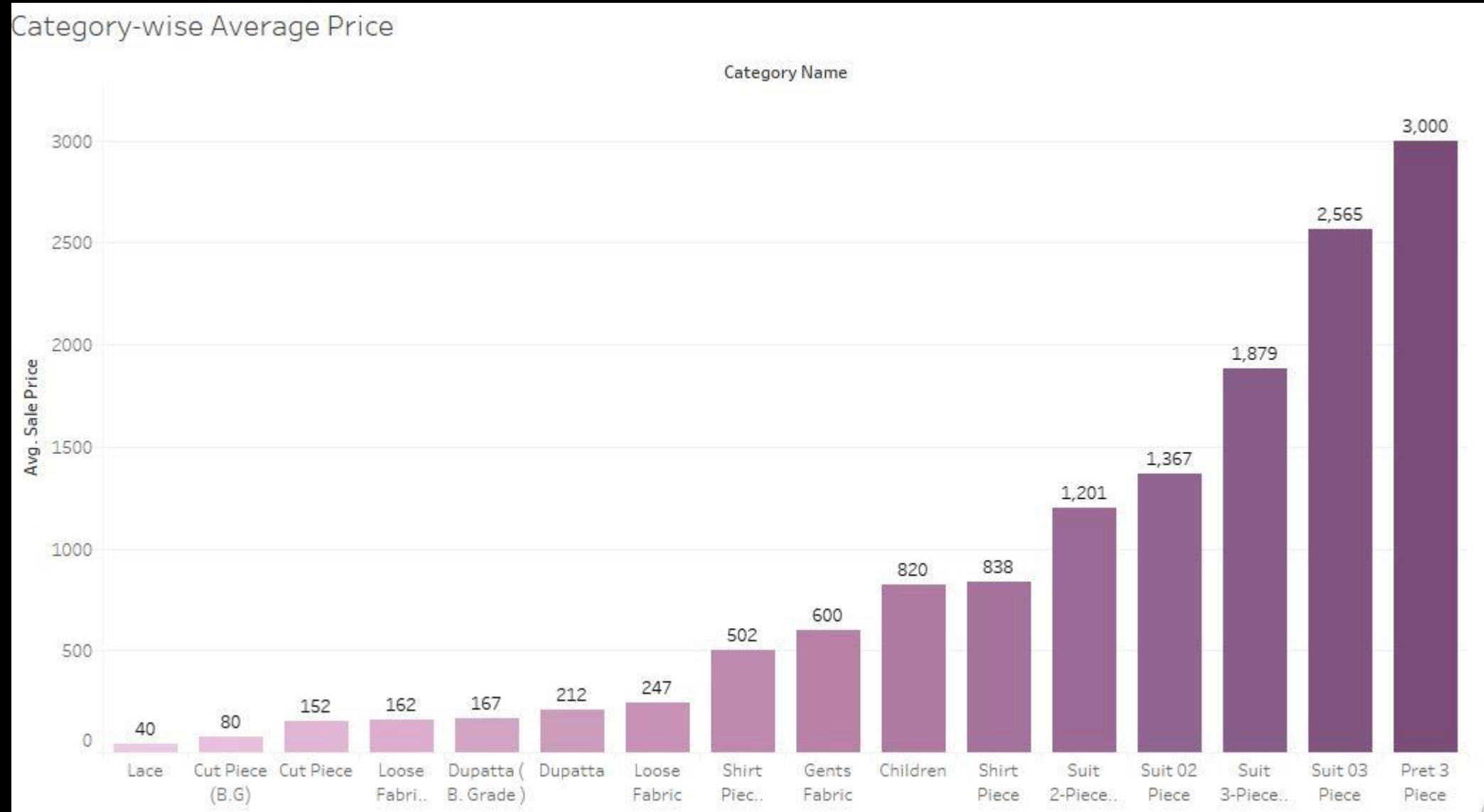
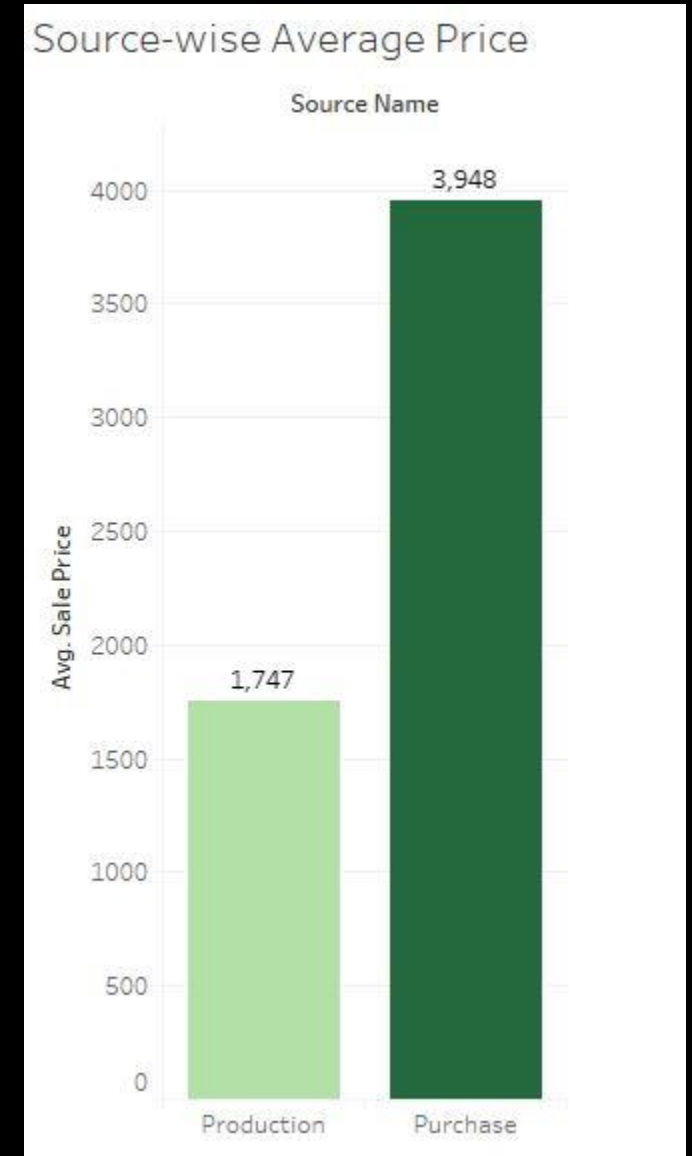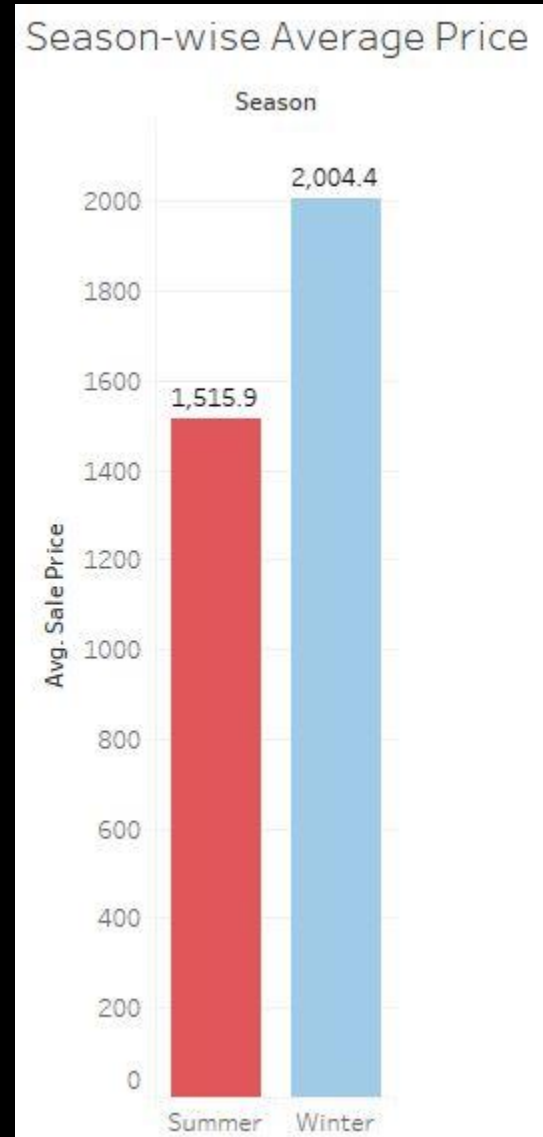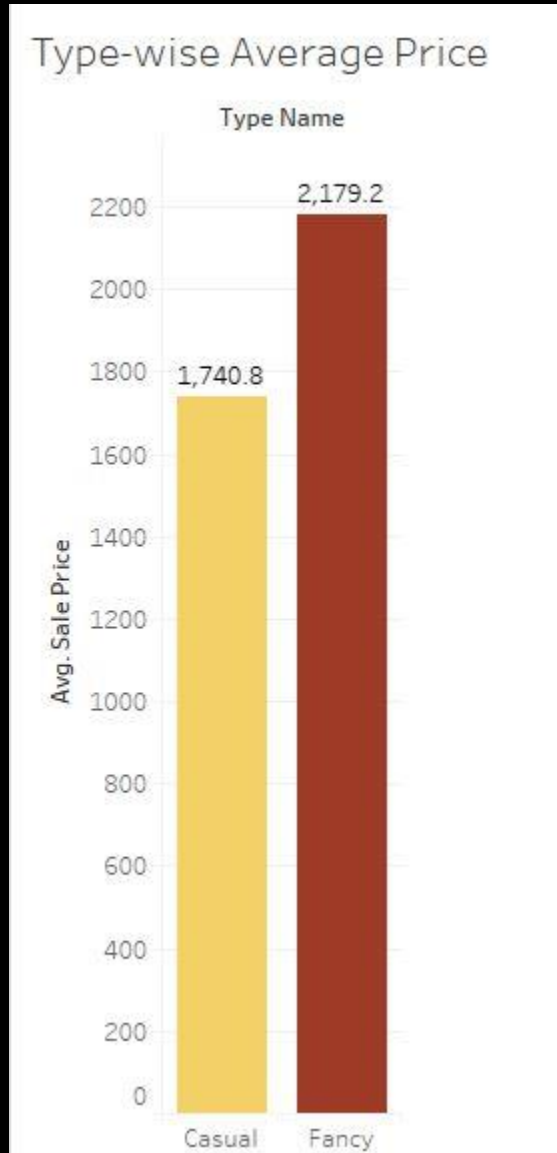# EDA-Class Wise Average Price

Class-wise Average Price
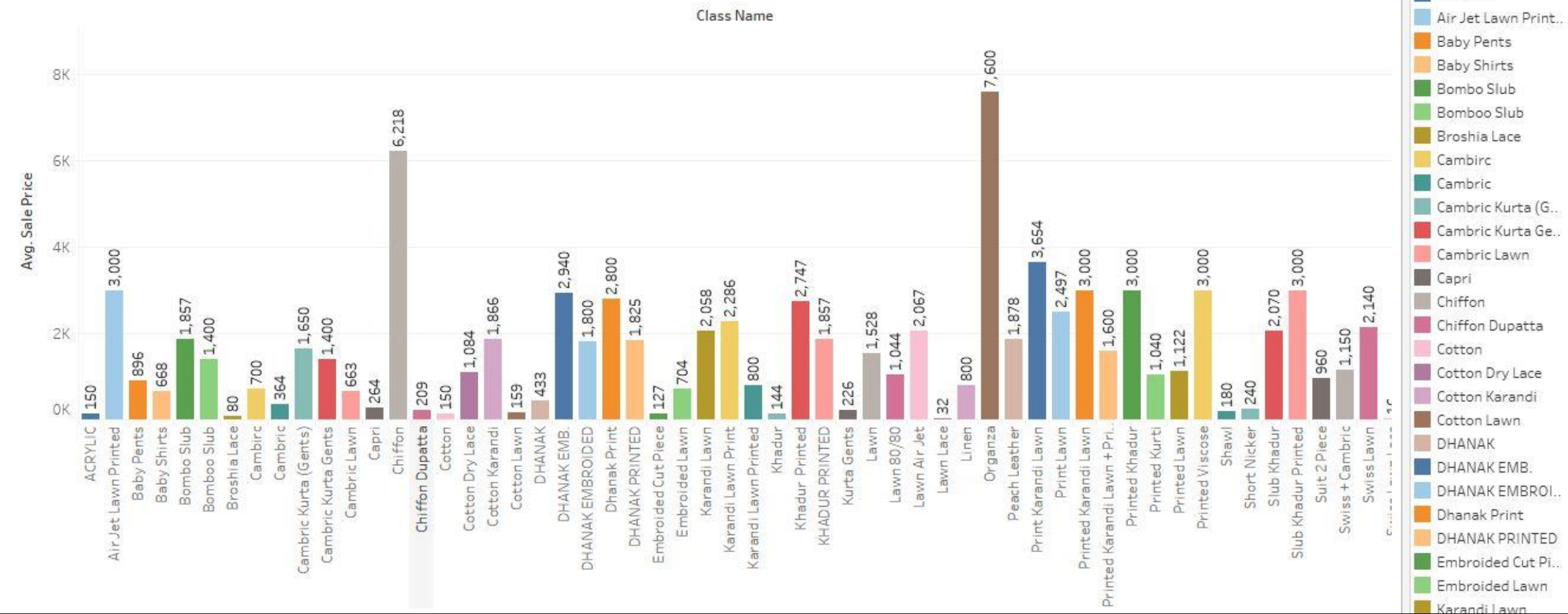
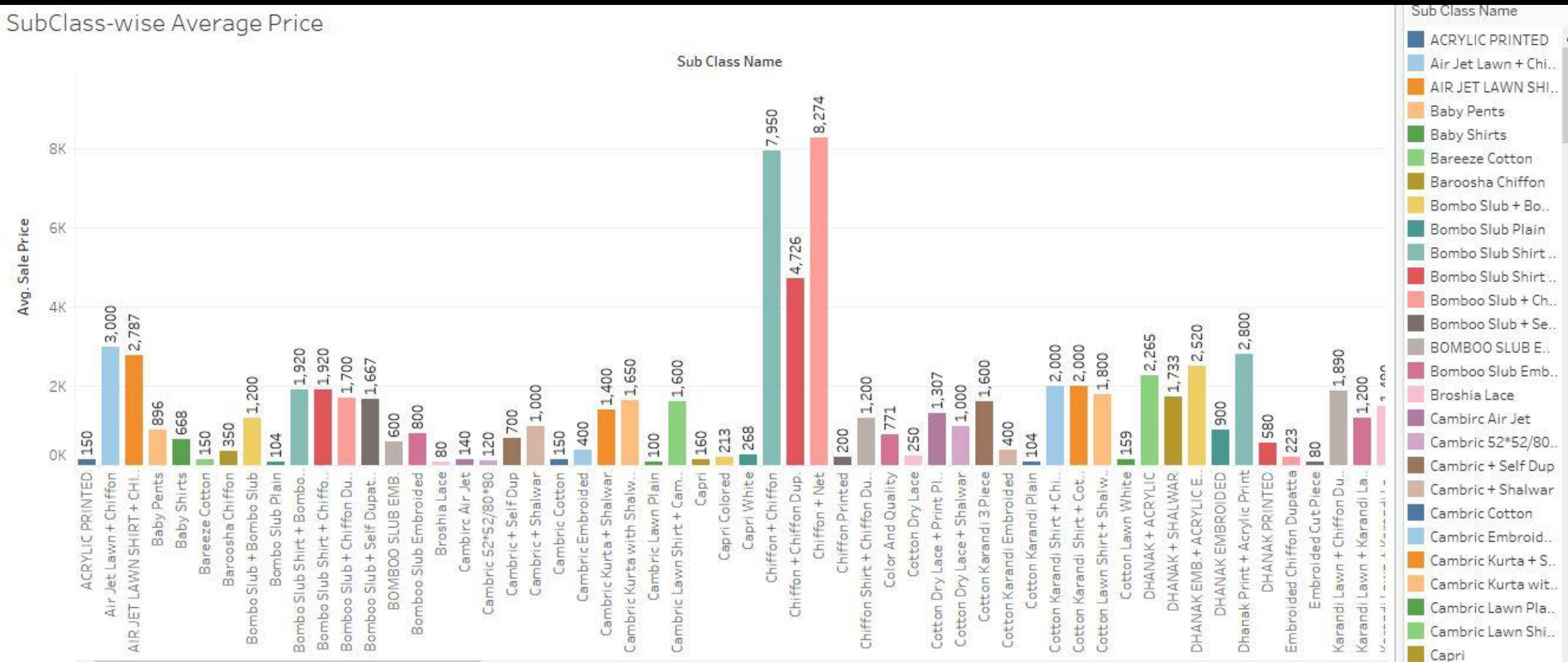# EDA-Design Wise

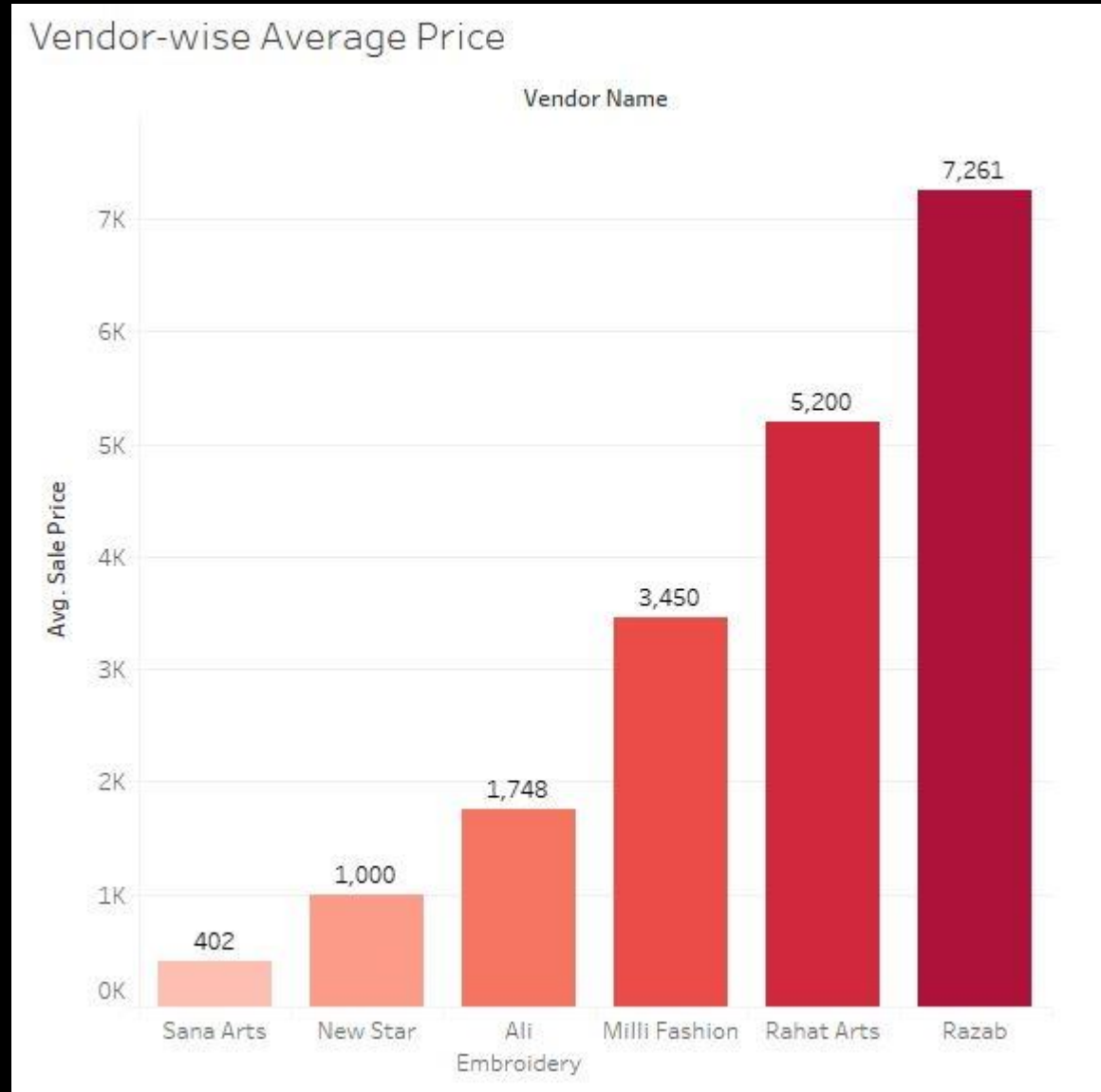Design-wise Average Price

EDA-Season Wise, Type wise, Source Wise
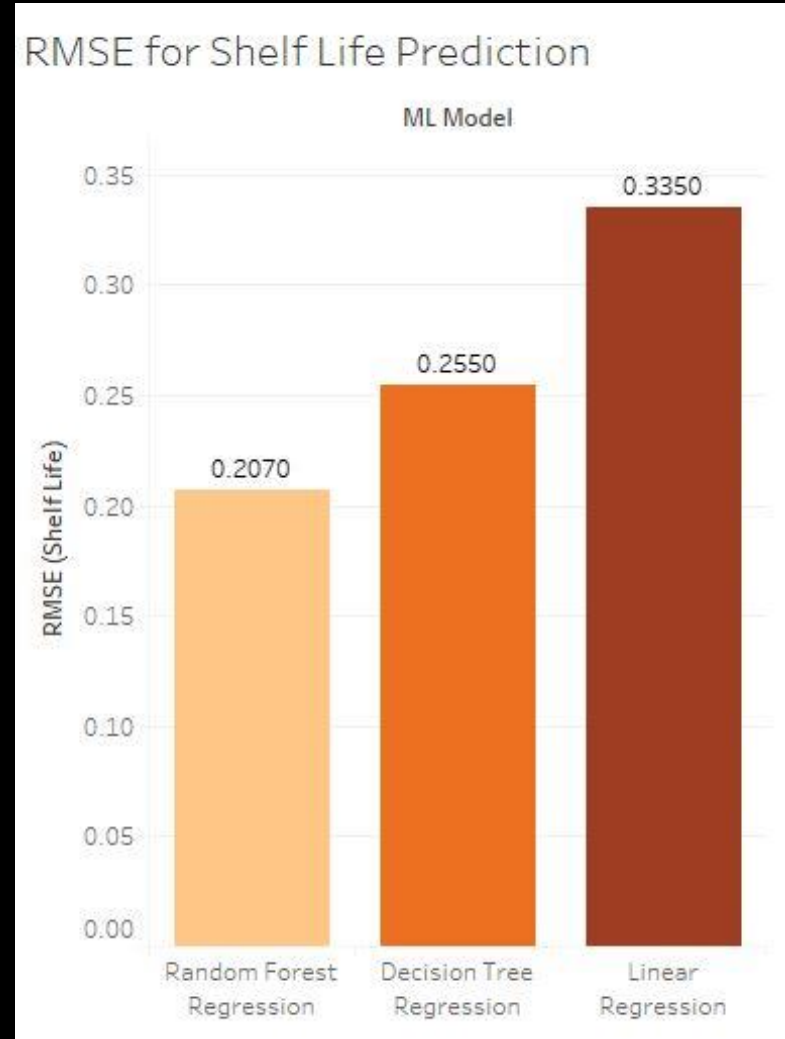
EDA-Sub Class Wise

SubClass-wise Average Price

EDA- Vendor Wise

Vendor-wise Average Price

Vendor Name

Sana Arts	New Star	Ali Embroidery	Milli Fashion	Rahat Arts	Razab
402	1,000	1,748	3,450	5,200	7,261

ML Model for Price Suggestion
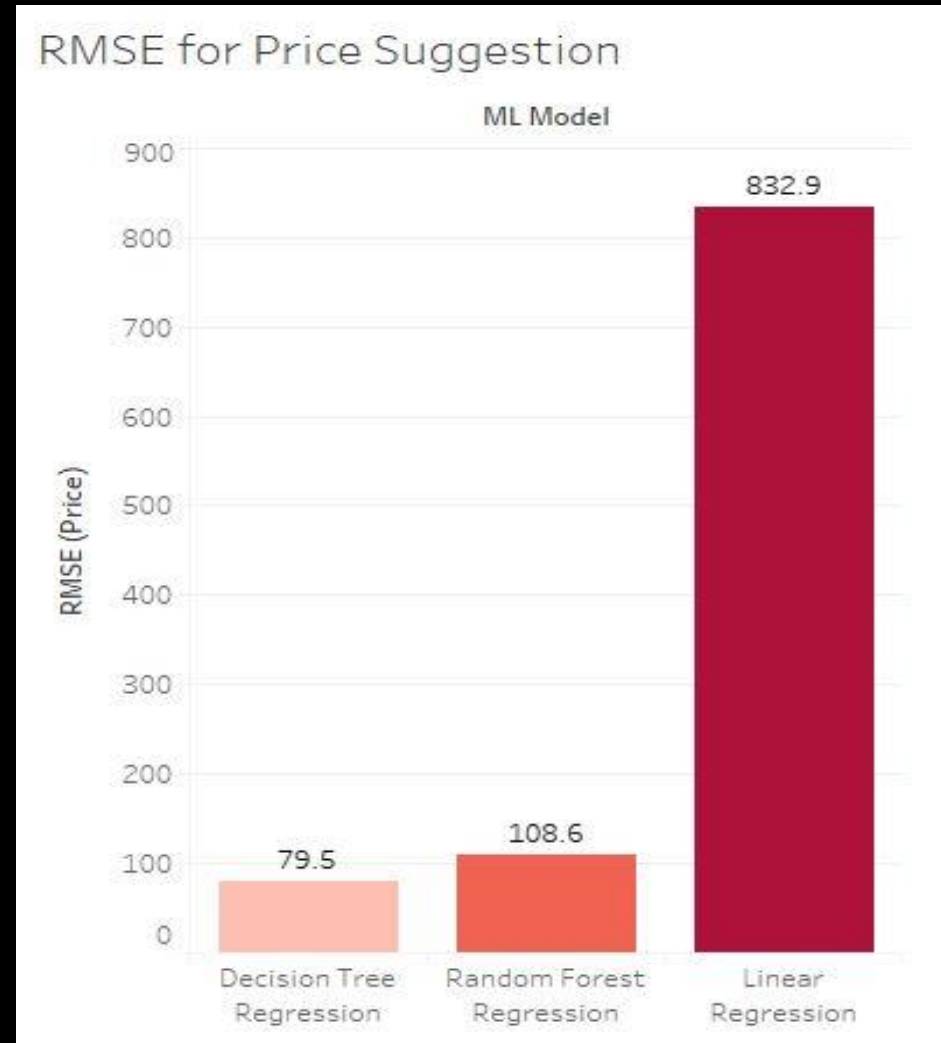
ML Model for Shelf Life Prediction

Web Api and App

- A flask based web api that will sit between .net desktop app and machine learning models

- It will take parameters of an item

- Pass them to ML model

- Get the result and provide it back to requester(.net app)

Action Plan

- ✓ Domain Understanding
- ✓ Data Denormalization
- ✓ Data Cleaning
- ✓ EDA
- ✓ Feature Engineering
- ✓ Applying Machine Learning Algorithms
- ✓ Web Api
- ✓ Windows App
- ✓ ML Models
- ✓ Insights (BI Dashboard) (In progress)