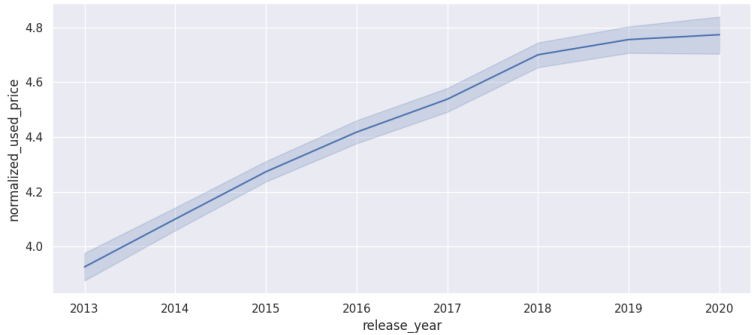
Supervised Learning - Foundations Project: ReCell

Dynamic Pricing Strategy for Used and Refurbished Devices: Harnessing Machine Learning

7/22/2023

Contents / Agenda

- Growth of the refurbished deice market is forecasted to reach $52.7bn by 2023
- Consumers are looking even more for cost-effective solutions for their devices
- ReCell's Challenge: Lack of a dynamic pricing strategy for used and refurbished devices
- Solution approach: Building a machine learning model to predict device prices



Our Process

1. Collected and analyzed relevant data
2. Development of a linear regression model to predict device prices
3. Identification of key factors that significant influence prices

OLS Regression Results

Dep. Variable:	normalized_used_price	R-squared:	0.823
Model:	OLS	Adj. R-squared:	0.822
Method:	Least Squares	F-statistic:	1000.
Date:	Sat, 22 Jul 2023	Prob (F-statistic):	0.00
Time:	02:30:44	Log-Likelihood:	-51.689
No. Observations:	2590	AIC:	129.4
Df Residuals:	2577	BIC:	205.6
Df Model:	12		
Covariance Type:	nonrobust		

	coef	std err	t	P>|t|	[0.025	0.975]
const	1.4178	0.048	29.700	0.000	1.324	1.511
main_camera_mp	0.0142	0.001	10.431	0.000	0.012	0.017
selfie_camera_mp	0.0149	0.001	14.375	0.000	0.013	0.017
int_memory	-0.0001	6.78e-05	-2.006	0.045	-0.000	-3.09e-06
ram	0.0141	0.004	3.166	0.002	0.005	0.023
battery	0.0001	4.61e-06	22.035	0.000	9.25e-05	0.000
days_used	-6.615e-05	2.51e-05	-2.639	0.008	-0.000	-1.7e-05
normalized_new_price	0.4504	0.011	42.113	0.000	0.429	0.471
brand_name_Asus	0.0742	0.027	2.711	0.007	0.021	0.128
brand_name_Celkon	-0.1175	0.053	-2.204	0.028	-0.222	-0.013
brand_name_Microsoft	0.1164	0.056	2.087	0.037	0.007	0.226
os_Others	-0.1336	0.028	-4.809	0.000	-0.188	-0.079
4g_yes	0.0482	0.014	3.463	0.001	0.021	0.075

Omnibus:	130.540	Durbin-Watson:	2.029
Prob(Omnibus):	0.000	Jarque-Bera (JB):	213.633
Skew:	-0.414	Prob(JB):	4.08e-47
Kurtosis:	4.137	Cond. No.	3.99e+04

Notes:
[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.
[2] The condition number is large, 3.99e+04. This might indicate that there are
strong multicollinearity or other numerical problems.

Key Findings and Insights

- Our model can explain about 80% of the price variance
- Key factors influencing prices are:
    1. Brand - Brands like Apple or Samsung may hold their value better than others impacting the device's resale value
    2. Device Age – Newer models generally sell for more than older ones
    3. Device Condition – If the device is in good working order it will likely sell for more
    4. Storage Capacity – Devices with larger storage capacities typically sell for higher prices than similar devices with less storage
- Identified potential to enhance model accuracy and prediction power

Business Recommendations

- Deep dive into key features impacting the price
- Explore different model types for improved accuracy
- Fine tune the current model’s hyperparameters
- Manage outlier to improve model performance
- Implement cross validation techniques for maximum performance

Key Takeaways

- The used and refurbished device market presents a significant growth opportunity
- Machine learning can effectively drive data-based decision making
- Ongoing model optimization will ensure the solution stays relevant

Questions?

Great Learning

Happy Learning !