BAX 442 Homework 2

Team F: Richard Liu, Charles Wang, Qinyi Qiu, Yuxin Yi, Jie Zhu

Table Result

Residual & Data Bootstrap

Richard

	Residual Mean	Residual 2.5%	Residual 97.5%	Data Mean	Data 2.5%	Data 97.5%
Screen_75	193.30749	46.23124	345.22146	211.09531	14.83425	425.00954
Screen_85	182.39427	28.26589	340.62093	188.48312	40.18199	351.30472
4k	329.5566	201.2290	490.2366	336.8685	147.2201	562.3821
Sony	-71.19492	-189.21032	46.73268	-74.25987	-237.24019	72.84837

Charles

	Residual Mean	Residual 2.5%	Residual 97.5%	Data Mean	Data 2.5%	Data 97.5%
Screen_75	-49.01459	-187.92266	76.33074	-54.13882	-176.10828	78.65480
Screen_85	-164.83836	-298.96443	-38.30174	-171.946709	-342.775817	1.086625
4k	-35.55297	-140.2503	62.02191	-36.89406	-166.64676	95.52959
Sony	-21.84713	-124.14031	73.69728	-22.35684	-145.14006	102.71558

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Qinyi Qiu

	Residual Mean	Residual 2.5%	Residual 97.5%	Data Mean	Data 2.5%	Data 97.5%
Screen_75	70.88444	-255.97770	420.21211	223.6970	-593.0231	399.0438
Screen_85	303.64963	-12.99008	739.15532	615.6793	-165.6672	730.8655
4k	876.4613	486.7427	1698.1475	1224.2809	399.9072	1894.5821
Sony	-72.43767	-392.34578	175.21335	-439.7697	-560.7630	157.4060

Yuxin Yi

	Residual Mean	Residual 2.5%	Residual 97.5%	Data Mean	Data 2.5%	Data 97.5%
Screen_75	145.8741	124.3543	167.6588	146.0877	111.5109	166.6667
Screen_85	323.7419	301.9795	348.0444	322.8403	292.9572	337.7246
4k	1001.1866	965.6334	1039.2073	1001.0596	965.0816	1035.8067
Sony	97.51880	80.13501	114.61379	97.56110	83.33333	122.67418

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Jie Zhu

	Residual Mean	Residual 2.5%	Residual 97.5%	Data Mean	Data 2.5%	Data 97.5%
Screen_75	-205.91184	-401.40644	-45.29826	-206.074584	-452.736372	-9.506647
Screen_85	-114.35868	-297.92526	51.85106	-119.26370	-314.25007	58.80246
4k	348.3208	199.0561	539.0233	356.8092	156.6792	625.0126
Sony	194.62507	68.68955	362.29146	195.1127	22.7271	374.8140

Explanation of understanding for residual bootstrap & data bootstrap:

The residual bootstrap is typically used in regression analysis and could be done by resampling the residuals (errors) to create a new dataset and add the residuals back to the model and create new predictions with new response values.

Data bootstrap is a technique that resamples the original observations with replacements. Unlike the residual bootstrap we discussed above, the data bootstrap requires resampling the original data points with replacements to create the new sample, just like what we have done in our R code.

Looking at our results, when both bootstrap methods are having almost the same results, for example, same confidence interval, it means that both methods are robust in estimating the results. Specifically, Yuxin's result clearly shows that the result from residual bootstrap and data bootstrap are robust for the dataset.

For other people, the bootstrap method for residual and data are having different results. Qinyi's result shows significant difference between residual bootstrap and data bootstrap, only the upper (97.5th percentile) values show similar results.