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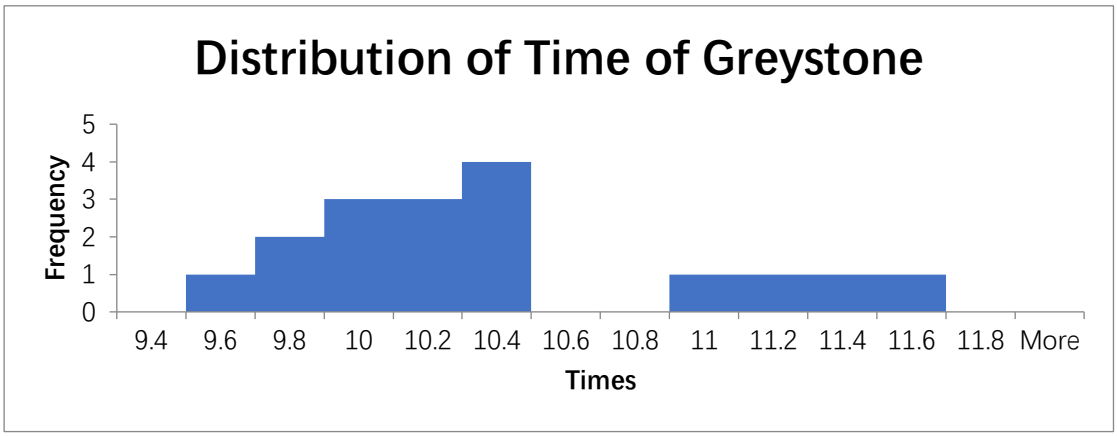
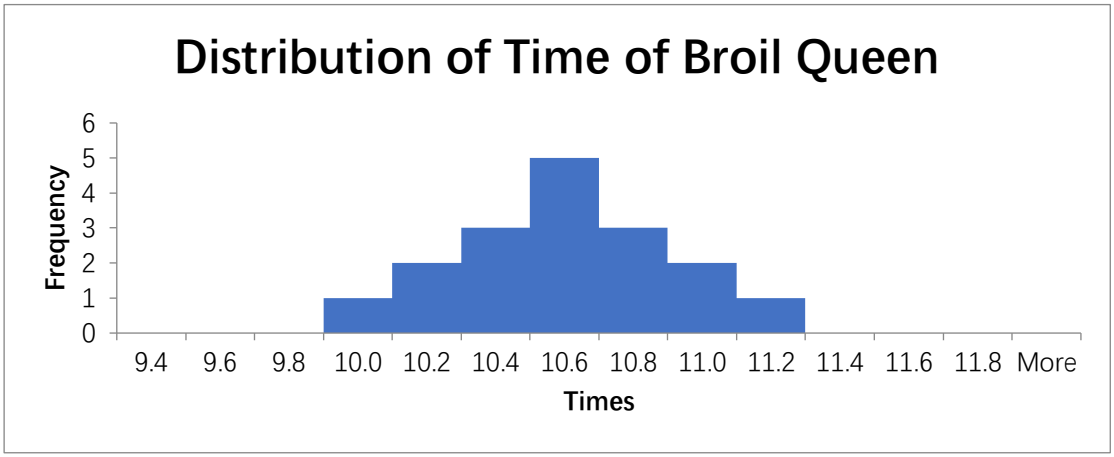
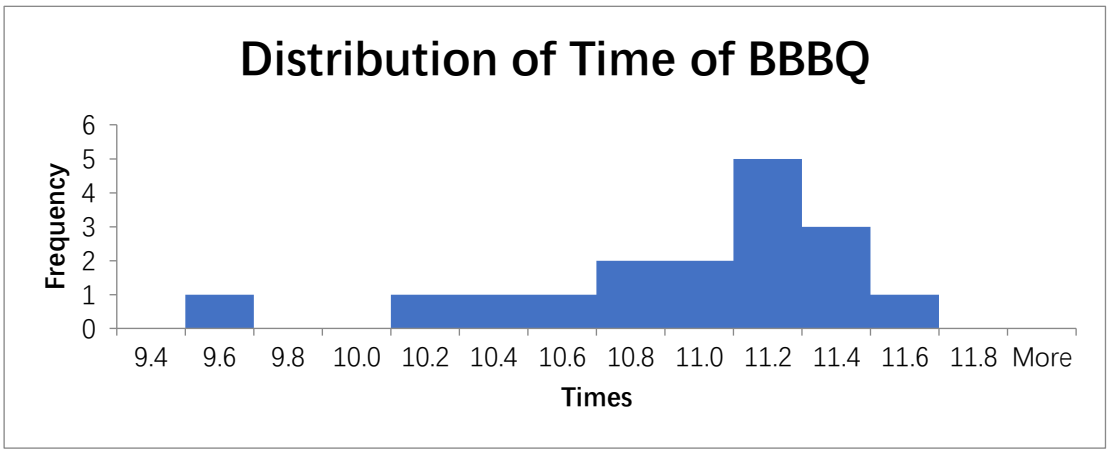
Q1. (a) This is an experiment because there is human intervention in it, and researcher undertake some experiment to get the results, and it involves random selection on the steak and grill brands.

The population inference is applicable since the steaks and grill brands are randomly selected, The causal inference is not applicable with no causal relationships associated.

Q2. (a)





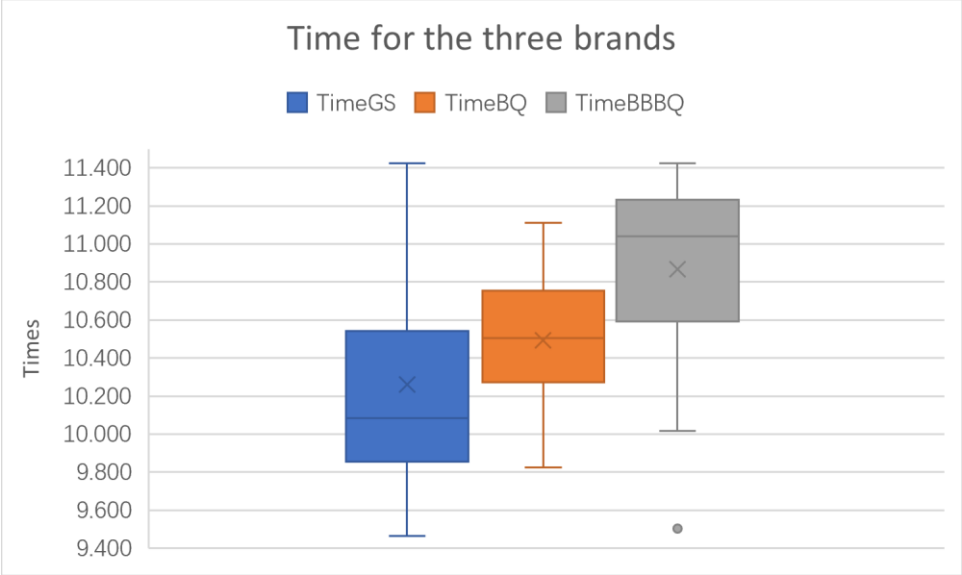


(b) There are all unimodal. The one of Greystone is right-skewed, that of Broil queen is symmetric, that of BBBQ is left-skewed. There is no outlier for the three distributions.

(c) The distribution of Greystone has a mode at 10.2~10.4 (smallest among the three), and

spread through the range of 9.4~11.6 (largest among the three)
The one of Broil Queen has a mode at 10.4~10.6 (medium), and spread through 9.8~11.2 (smallest)
The one of BBBQ has a mode at 11.0~11.2 (largest), and spread through 9.4~11.6 (largest)
(d) The distribution of Greystone has mean > median
The one of Broil Queen has mean = median
The one of BBBQ has mean < median

Q3. (a)



(b) The boxplot for GS is up-skewed (right-skewed), that for BQ is down-skewed (left-skewed), that for BBBQ is down-skewed (left-skewed).
One outlier for boxplot of time for BBBQ
(c) For GS, center is the smallest among the three, spread is the largest among the three.
For BQ, center is the medium, spread is the smallest.
For BBBQ, center is the highest, spread is the medium.
(d) Modes analysis is consistent with Q2(c).
Ranges analysis is not consistent with Q2(c).
In boxplot, spread is the medium instead of largest for distribution of BBBQ.

Q4. (a)

BRAND	Greystone	Broil Queen	BBBQ
MEAN	10.263	10.494	10.868
STD. DEV.	0.564	0.337	0.519
MODE(S)	10.08	10.432	10.912
RANGE	1.960	1.288	1.920

For means, BBBQ > BQ > GS. For STD. DEV., GS > BBBQ > BQ
For modes, BBBQ > BQ > GS. For ranges, GS > BBBQ > BQ
Modes analysis is consistent with Q2(c).
Ranges analysis is not consistent with Q2(c)

In Q2(c), for ranges, BBBQ = GS > BQ

(b)

BRAND	Greystone	Broil Queen	BBBQ
MIN	9.464	9.824	9.504
Q1	9.888	10.272	10.72
MEDIAN	10.084	10.504	11.04
Q3	10.272	10.728	11.2
MAX	11.424	11.112	11.424
IQR	0.384	0.456	0.48

The 5-number summary is consistent with conclusions about the shape in Q3, but not Q2.

For GS, median=10.084 < mean=10.263, so right-skewed.

For BQ, median=10.504 > mean=10.494. so left-skewed not symmetric

For BBBQ, median=11.04 > mean=10.868, so left-skewed.

(c)

MASS	MEAN	STD. DEV.	MEAN CHANGE
2.000	9.59733	0.19732	NaN
2.125	9.90933	0.18475	0.31200
2.250	10.19733	0.37908	0.28800
2.375	10.19733	0.33307	0.00000
2.500	10.30933	0.44119	0.11200
2.625	10.58400	0.64374	0.27467
2.750	10.44400	0.57236	-0.14000
2.875	10.50933	0.37184	0.06533
3.000	10.46400	0.50798	-0.04533
3.125	10.70933	0.56914	0.24533
3.250	10.80000	0.49960	0.09067
3.375	10.59200	0.32000	-0.20800
3.500	10.59867	0.32021	0.00667
3.625	10.92267	0.18475	0.32400
3.750	11.14933	0.03233	0.22667
3.875	11.13733	0.32517	-0.01200
4.000	11.08267	0.56372	-0.05467

Highest mean change is 0.32400 as mass=3.625.

Lowest mean change is -0.20800 as mass=3.375.

Average mean change is 0.09283.

Q5. In terms of variation, the lower variation the best, BQ is the best brand with an STDEV of 0.337.

In terms of fastest time, GS is the best brand with a MEAN of 10.263 and a smallest range (spread).

The trend in Q4(c) does not impact the choice of best brand because it analyzes the mean and STDEV of the three brands in total, the result is the performance of the three brand

together. We cannot identify which one is the best brand according to this.