# Survey Analysis: Output and Summary
# for
# The Medical Cannabis Cultivation Center Applications

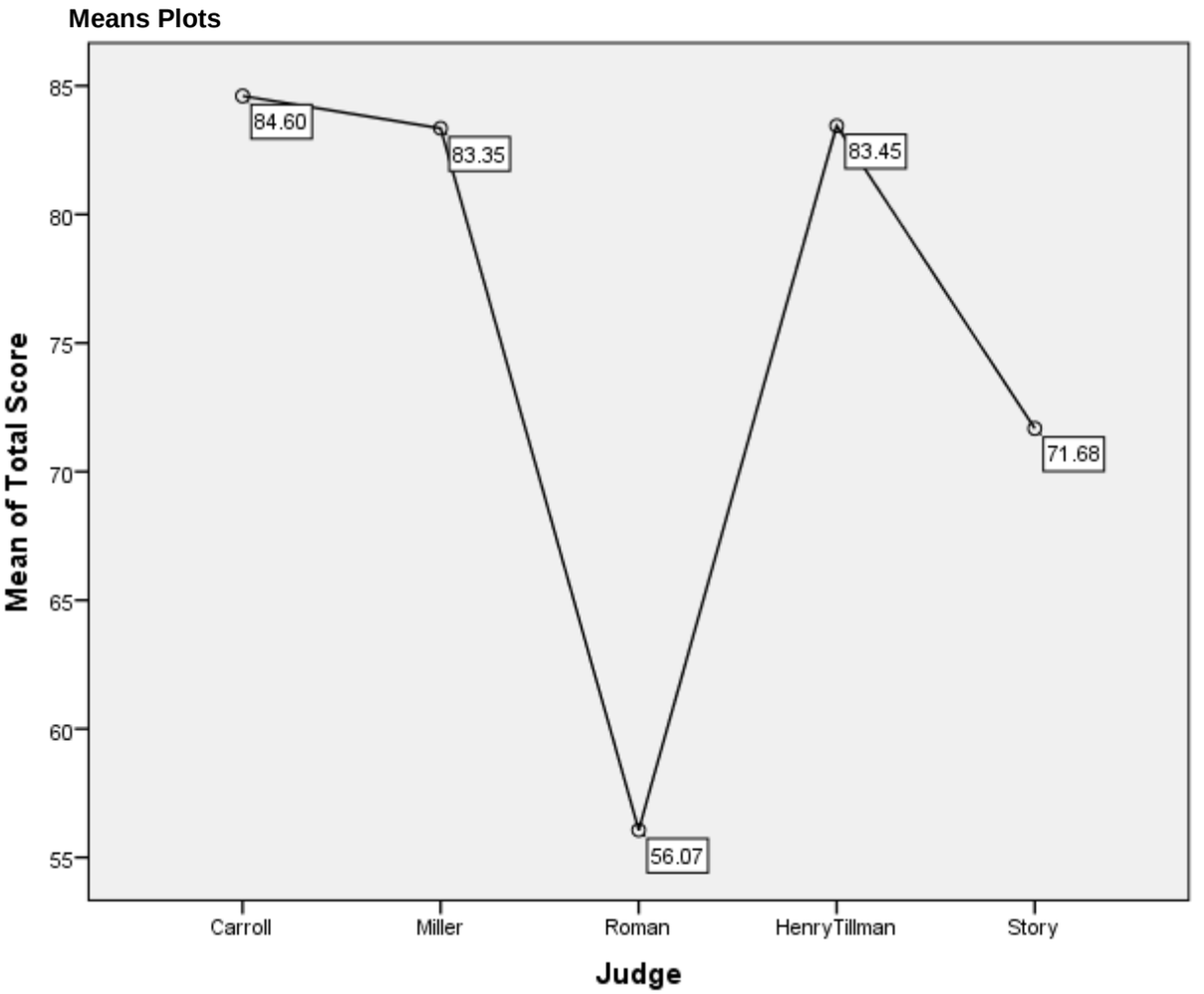
May 2018

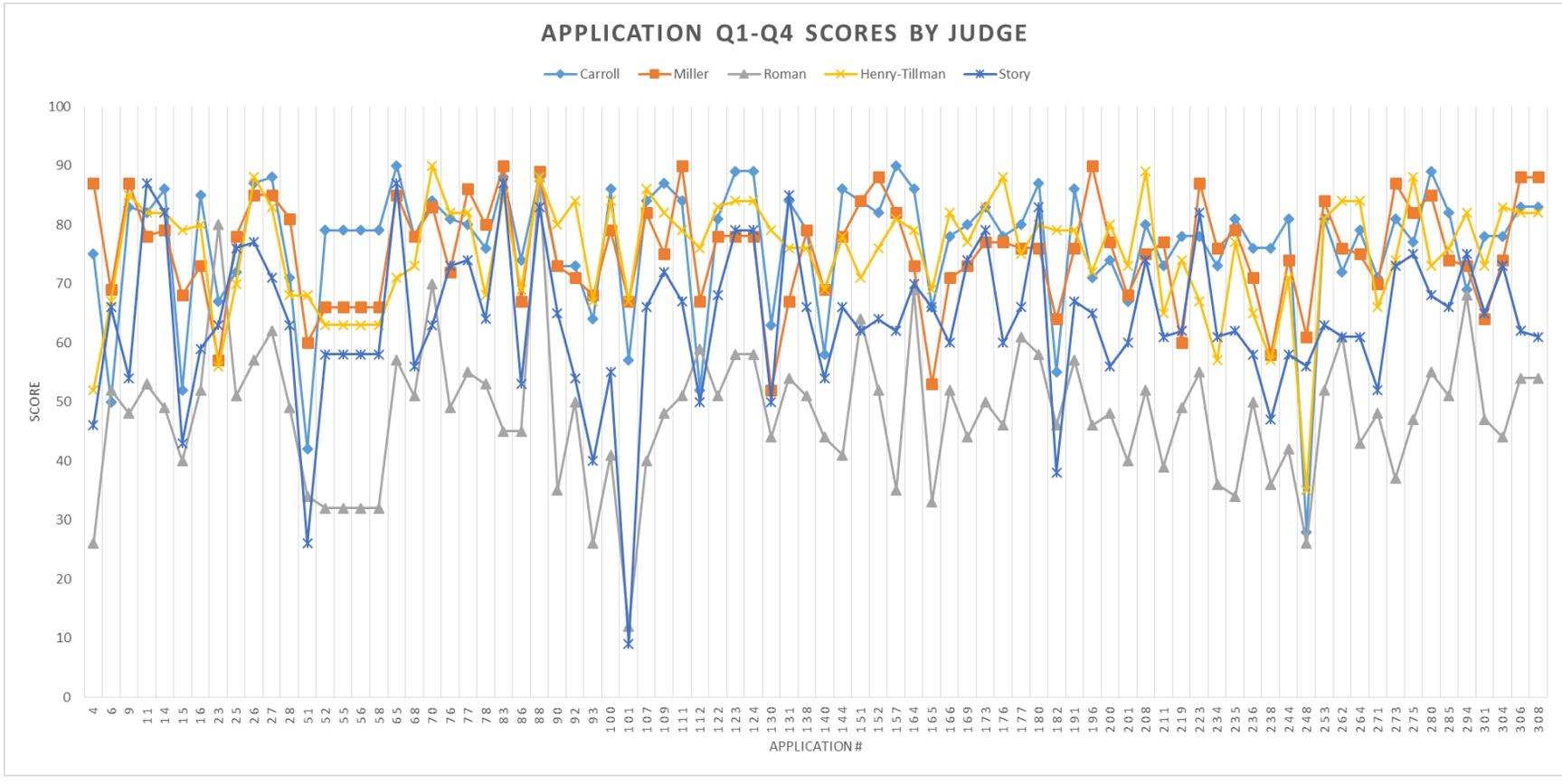
**Introduction:**

The following report is a summary of the analyses and results conducted on the scoring outcomes of the judges assessing the medical marijuana cultivation centers license applications. Each exploration conducted is accepted in the implementation of statistical analysis, proven in methodology, and conducted by a doctor of philosophy, master of public health in epidemiology and biostatistics, and professor of statistics and research practice.

**Notable Findings for Total Mean Scores of the Judges:**

- A post hoc analysis was conducted to determine statistical significance between the judges' total mean scores (Q1-Q9) and which groups, if any, were homogeneous. The total mean scores for Carroll ($\bar{x}$ = 84.6, sd = 12.1), Miller ($\bar{x}$ = 83.33, sd = 9.5), and Henry-Tillman ($\bar{x}$ = 83.45, sd = 10.1) were not statistically different from one another. However, Roman's total mean scores ($\bar{x}$ = 56.07, sd = 12.7) statistically differed from all other judges, as did Story's total mean scores ($\bar{x}$ = 71.68, sd = 13.9). The p-value to indicate statistical significance was set at ≤0.05. These significant differences could indicate that the score sheet or method of scoring is unreliable and/or invalid. This cannot be definitive unless it is known whether or not the instrument was validated prior to administering to the judges.




APPLICATION Q1-Q4 SCORES BY JUDGE
Carroll
Miller
Roman
Henry-Tillman
Story
SCORE
APPLICATION #

# Question 1

**Sch 1 Qualifications of applicant * Judge Crosstabulation**

Count

| | | Judge | | | | | |
|---|---|---|---|---|---|---|---|
| | | Carroll | Miller | Roman | HenryTillman | Story | Total |
| Sch 1 Qualifications of applicant | 0 | 0 | 1 | 0 | 0 | 1 | 2 |
| | 3 | 1 | 31 | 11 | 0 | 2 | 45 |
| | 4 | 0 | 0 | 5 | 0 | 0 | 5 |
| | 5 | 0 | 0 | 19 | 0 | 0 | 19 |
| | 6 | 6 | 19 | 19 | 4 | 25 | 73 |
| | 7 | 0 | 0 | 7 | 0 | 0 | 7 |
| | 8 | 40 | 15 | 14 | 3 | 32 | 104 |
| | 9 | 0 | 0 | 6 | 0 | 0 | 6 |
| | 10 | 35 | 16 | 1 | 75 | 22 | 149 |
| Total | | 82 | 82 | 82 | 82 | 82 | 410 |

## Notable Findings for Q1:

- 92% (n=75) of Henry-Tillman's applicants received a perfect score.
- Only 1 of Roman's applicants received a perfect score (application #88 – Natural State Medicinals Cultivation).
- <44% of all applicants received a perfect score for all other judges.
- Miller and Roman were not statistically different from each other on Q1 but did differ from all other judges. Story, Carroll, and Henry-Tillman significantly differed from all other judges independently.

### Homogeneous Subsets

**Qualifications of applicant**

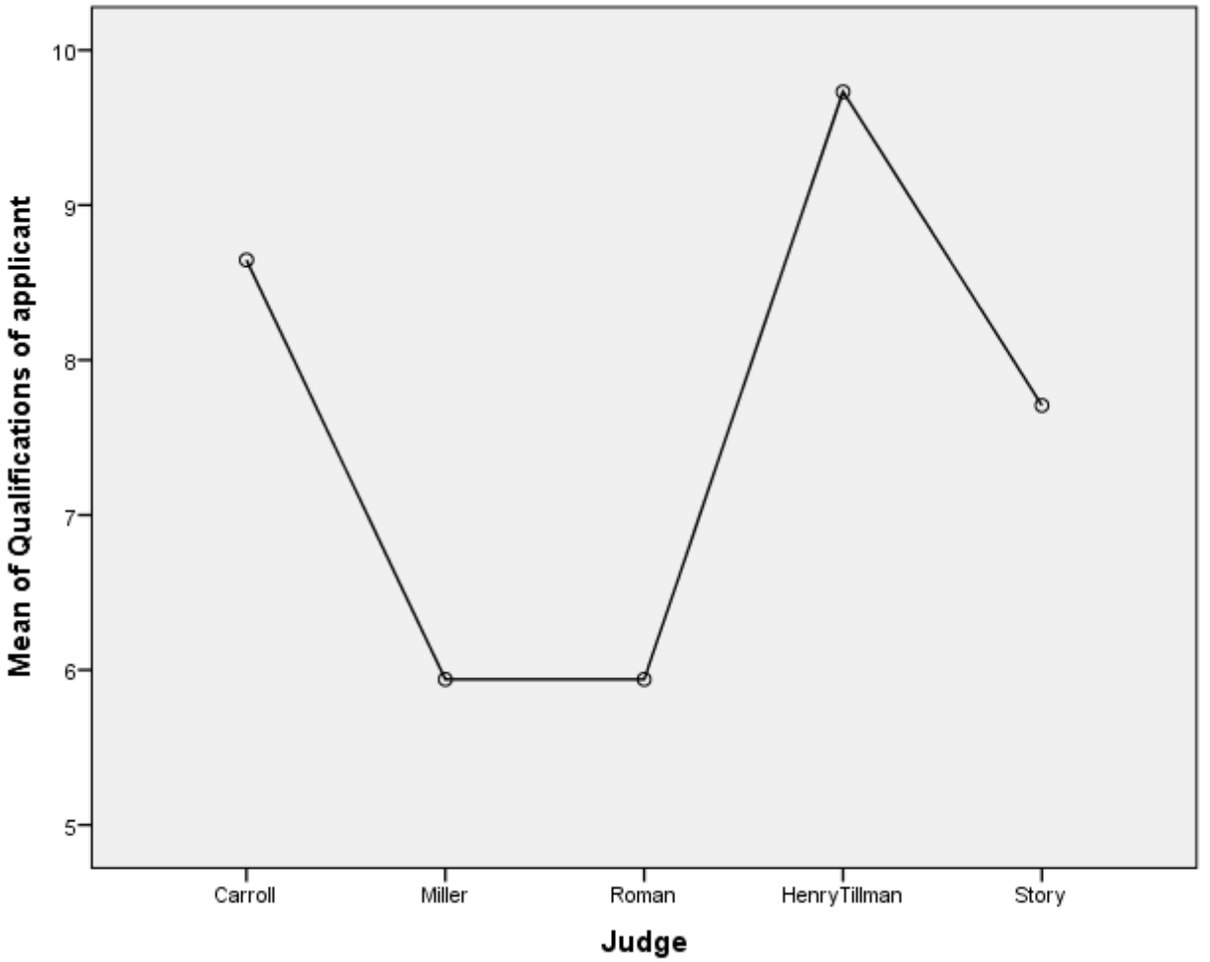
Tukey HSD[a]

| | | Subset for alpha = 0.05 | | | |
|---|---|---|---|---|---|
| Judge | N | 1 | 2 | 3 | 4 |
| Miller | 82 | 5.94 | | | |
| Roman | 82 | 5.94 | | | |
| Story | 82 | | 7.71 | | |
| Carroll | 82 | | | 8.65 | |
| HenryTillman | 82 | | | | 9.73 |
| Sig. | | 1.000 | 1.000 | 1.000 | 1.000 |

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 82.000.

**Means Plots**


Mean of Qualifications of applicant
10
9
8
7
6
5
Carroll
Miller
Roman
HenryTillman
Story
Judge

# Question 2

**Sch 2 Ability to Operate: Manufacturing * Judge Crosstabulation**

Count

| | | Judge | | | | | |
|---|---|---|---|---|---|---|---|
| | | Carroll | Miller | Roman | HenryTillman | Story | Total |
| Sch 2 Ability to Operate: Manufacturing | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| | 3 | 0 | 0 | 1 | 0 | 0 | 1 |
| | 4 | 0 | 0 | 3 | 0 | 0 | 3 |
| | 5 | 2 | 0 | 15 | 1 | 2 | 20 |
| | 6 | 0 | 0 | 23 | 0 | 1 | 24 |
| | 7 | 0 | 0 | 18 | 0 | 0 | 18 |
| | 8 | 7 | 1 | 13 | 4 | 21 | 46 |
| | 9 | 0 | 0 | 2 | 0 | 0 | 2 |
| | 10 | 0 | 0 | 3 | 5 | 0 | 8 |
| | 11 | 0 | 0 | 1 | 0 | 0 | 1 |
| | 12 | 46 | 5 | 1 | 48 | 43 | 143 |
| | 13 | 0 | 0 | 1 | 3 | 0 | 4 |
| | 14 | 27 | 76 | 1 | 21 | 14 | 139 |
| Total | | 82 | 82 | 82 | 82 | 82 | 410 |

## Notable Findings for Q2:

- 93% (n=76) of Miller's applicants received a perfect score.
- Only 1 of Roman's applicants received a perfect score (application #88 – Natural State Medicinals Cultivation).
- <33% of applicants received a perfect score from other judges.
- Carroll and Henry-Tillman were not significantly different from one another on Q2 but did differ from all other judges. Roman, Story, and Miller statistically differed from all other judges independently.

## Homogeneous Subsets

**Ability to Operate: Manufactoring**

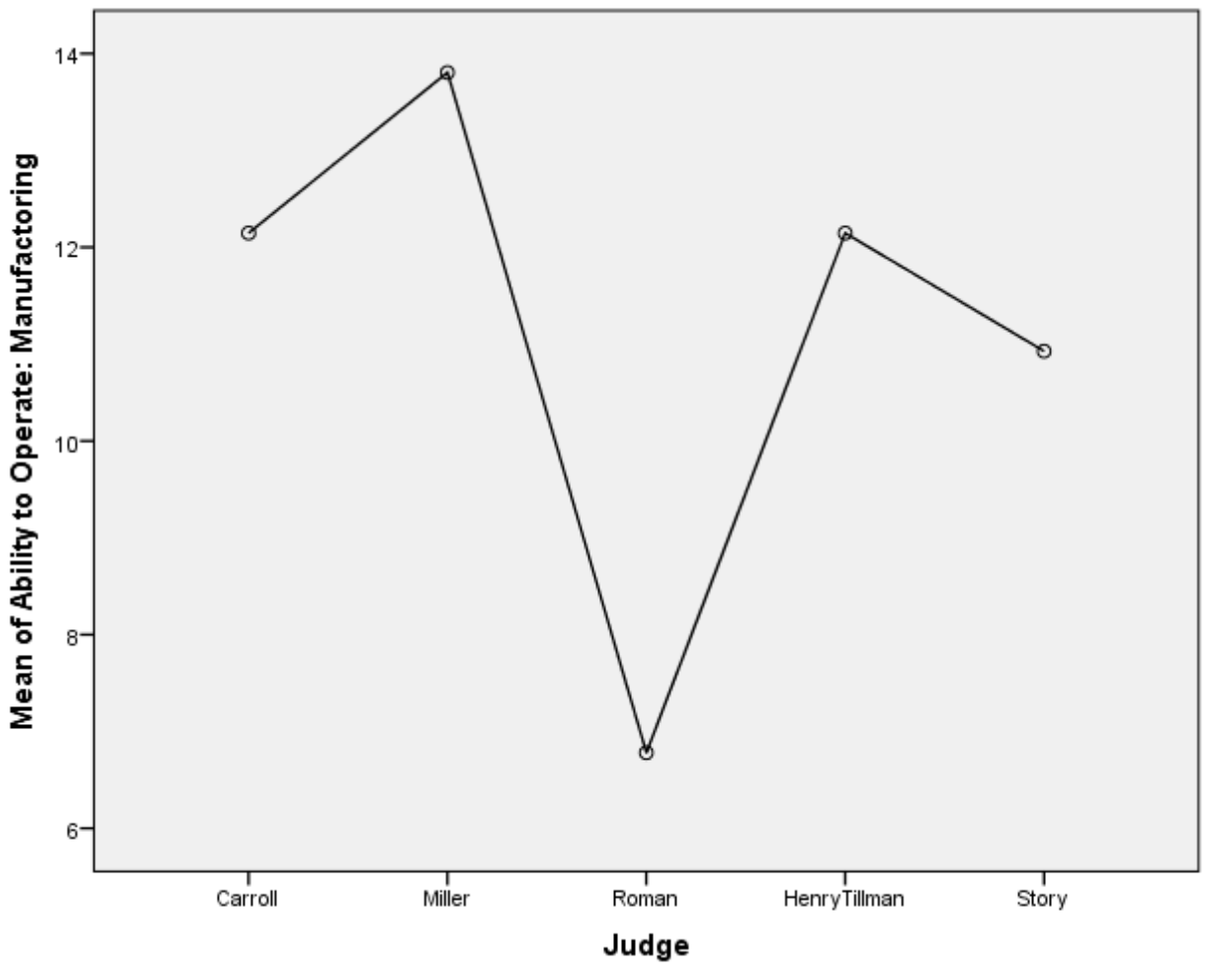
Tukey HSD[a]

| Judge | N | Subset for alpha = 0.05 | | | |
|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 |
| Roman | 82 | 6.78 | | | |
| Story | 82 | | 10.93 | | |
| Carroll | 82 | | | 12.15 | |
| HenryTillman | 82 | | | 12.15 | |
| Miller | 82 | | | | 13.80 |
| Sig. | | 1.000 | 1.000 | 1.000 | 1.000 |

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 82.000.

## Means Plots



# Question 2b

**2b Ability to Operate: Const. Comp * Judge Crosstabulation**

Count

| | | Judge | | | | | |
|---|---|---|---|---|---|---|---|
| | | Carroll | Miller | Roman | HenryTillman | Story | Total |
| 2b Ability to Operate: Const. Comp | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| | 1 | 0 | 0 | 1 | 0 | 0 | 1 |
| | 2 | 4 | 28 | 4 | 2 | 0 | 38 |
| | 3 | 0 | 0 | 2 | 0 | 0 | 2 |
| | 4 | 0 | 0 | 43 | 1 | 0 | 44 |
| | 5 | 10 | 23 | 16 | 13 | 31 | 93 |
| | 6 | 0 | 0 | 12 | 35 | 1 | 48 |
| | 7 | 49 | 7 | 3 | 2 | 34 | 95 |
| | 8 | 19 | 24 | 1 | 29 | 15 | 88 |
| Total | | 82 | 82 | 82 | 82 | 82 | 410 |

## Notable Findings for Q2b:

- Only 1 of Roman's applicants received a perfect score (application #88 – Natural State Medicinals Cultivation).
- 15-29 applicants received a perfect score from other judges.
- Roman and Miller did not statistically differ from one another on Q2b, while Story, Henry-Tillman, and Carroll did not statistically differ from each other but did statistically differ from Roman and Miller.

### Homogeneous Subsets

**Ability to Operate: Const. Comp**

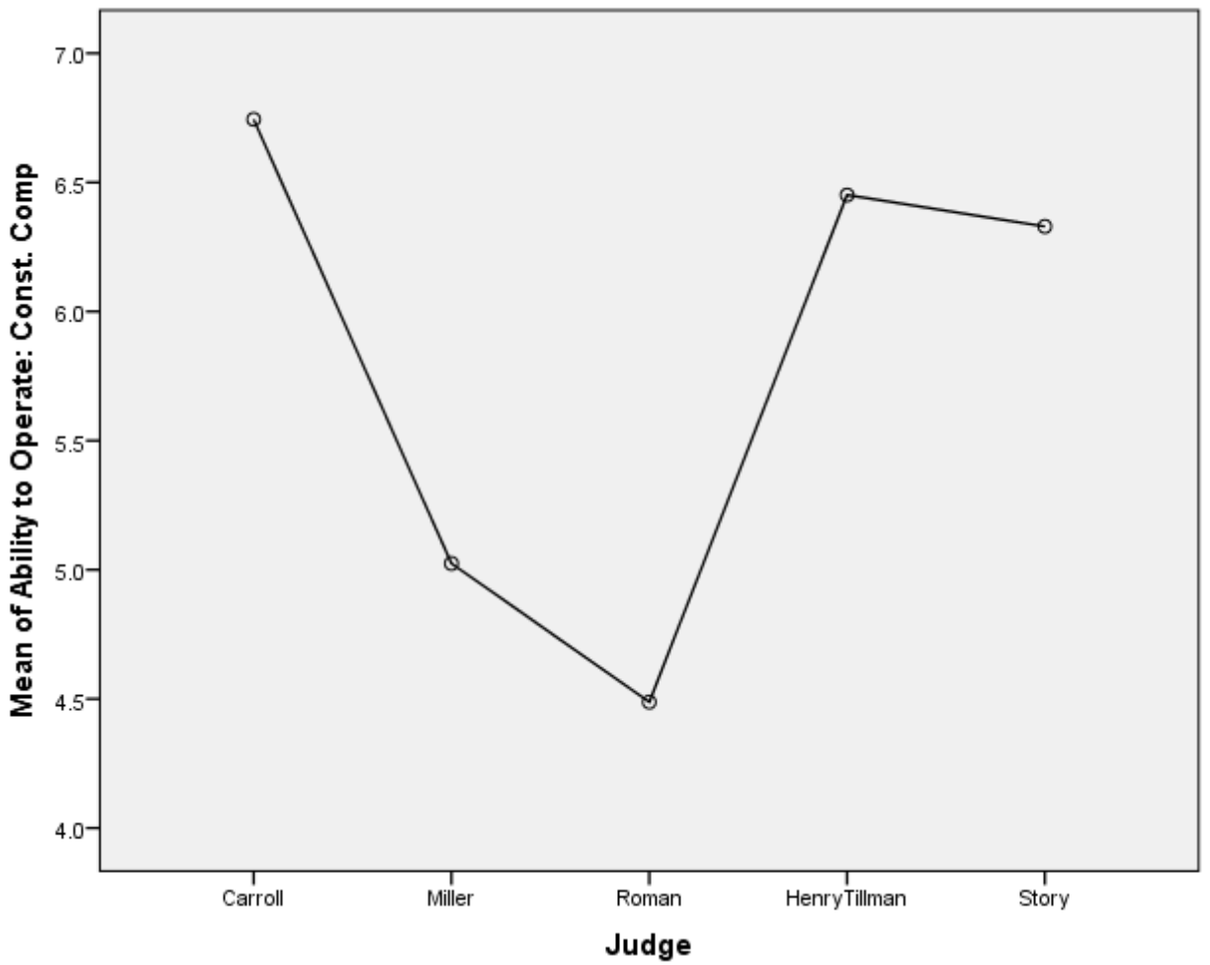
Tukey HSD[a]

| | | Subset for alpha = 0.05 | |
|---|---|---|---|
| Judge | N | 1 | 2 |
| Roman | 82 | 4.49 | |
| Miller | 82 | 5.02 | |
| Story | 82 | | 6.33 |
| HenryTillman | 82 | | 6.45 |
| Carroll | 82 | | 6.74 |
| Sig. | | .215 | .475 |

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 82.000.

**Means Plots**


Mean of Ability to Operate: Const. Comp
7.0
6.5
6.0
5.5
5.0
4.5
4.0
Carroll
Miller
Roman
HenryTillman
Story
Judge

# Question 2c

**2c Ability to Operate: Security & Storage * Judge Crosstabulation**

Count

| | | Judge | | | | | |
|---|---|---|---|---|---|---|---|
| | | Carroll | Miller | Roman | HenryTillman | Story | Total |
| 2c Ability to Operate: Security & Storage | 2 | 0 | 0 | 1 | 0 | 0 | 1 |
| | 3 | 2 | 1 | 4 | 1 | 10 | 18 |
| | 4 | 0 | 0 | 7 | 0 | 0 | 7 |
| | 5 | 10 | 6 | 34 | 10 | 33 | 93 |
| | 6 | 0 | 0 | 22 | 4 | 1 | 27 |
| | 7 | 49 | 5 | 7 | 18 | 19 | 98 |
| | 8 | 0 | 0 | 5 | 10 | 1 | 16 |
| | 9 | 21 | 70 | 2 | 39 | 18 | 150 |
| Total | | 82 | 82 | 82 | 82 | 82 | 410 |

## Notable Findings for Q2c:

- 85% (n=70) of Miller's applicants received a perfect score.
- Only 2 of Roman's applicants received a perfect score (application #88 – Natural State Medicinals Cultivation and application #191 – Medi Chai, LLC).
- Carroll and Henry-Tillman did not statistically differ from one another on Q2c but did differ from all other judges. Roman, Story, and Miller statistically differed from all other judges independently.

### Homogeneous Subsets

**Ability to Operate: Security & Storage**

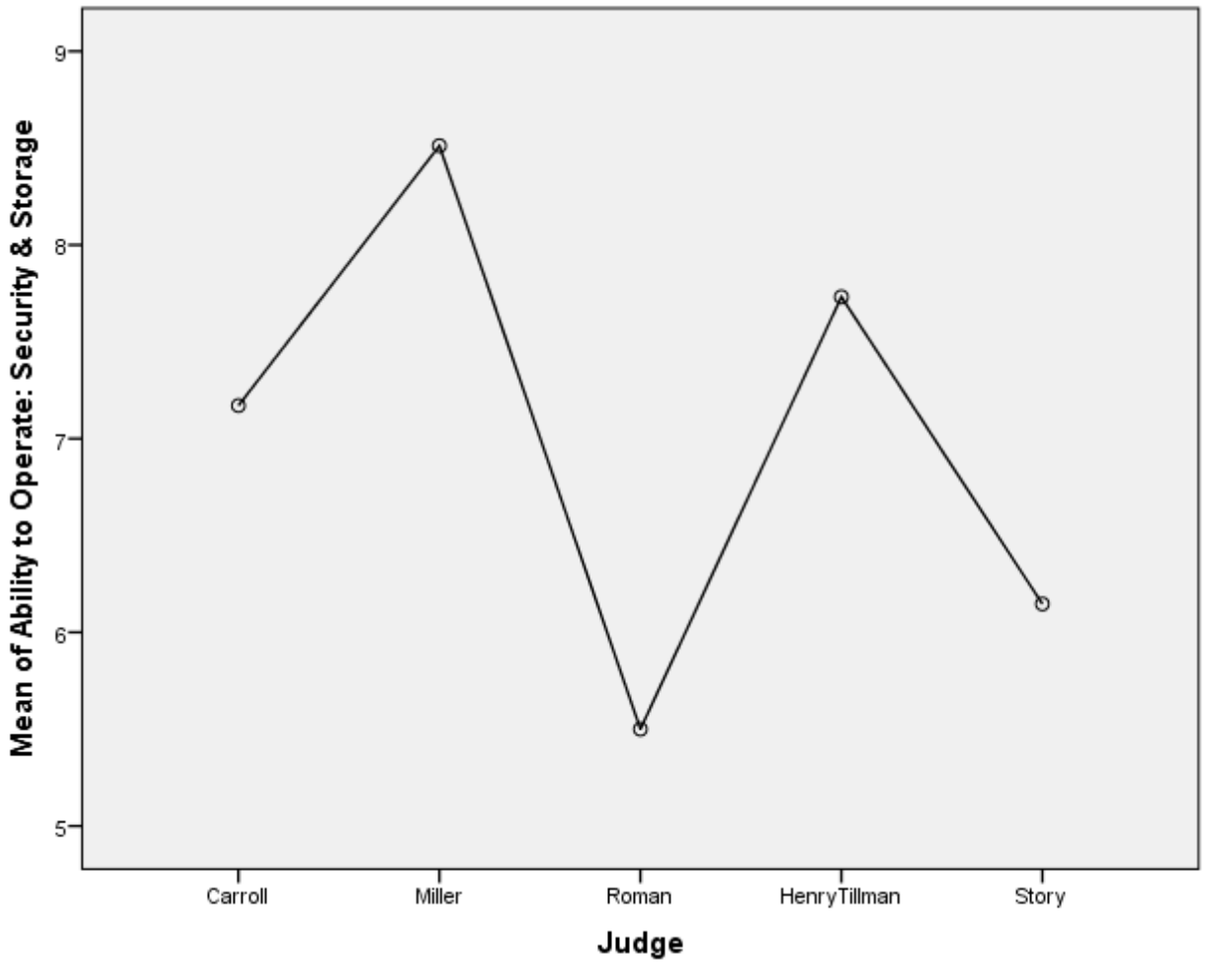
Tukey HSD[a]

| | | Subset for alpha = 0.05 | | | |
|---|---|---|---|---|---|
| Judge | N | 1 | 2 | 3 | 4 |
| Roman | 82 | 5.50 | | | |
| Story | 82 | | 6.15 | | |
| Carroll | 82 | | | 7.17 | |
| HenryTillman | 82 | | | 7.73 | |
| Miller | 82 | | | | 8.51 |
| Sig. | | 1.000 | 1.000 | .119 | 1.000 |

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 82.000.

**Means Plots**


Mean of Ability to Operate: Security & Storage
9
8
7
6
5
Carroll
Miller
Roman
HenryTillman
Story
Judge

# Question 2d

**2d Ability to Operate: Packing Reqs * Judge Crosstabulation**

Count

| | | Judge | | | | | |
|---|---|---|---|---|---|---|---|
| | | Carroll | Miller | Roman | HenryTillman | Story | Total |
| 2d Ability to Operate: Packing Reqs | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| | 1 | 0 | 0 | 1 | 0 | 0 | 1 |
| | 2 | 0 | 0 | 5 | 0 | 0 | 5 |
| | 3 | 7 | 0 | 5 | 2 | 3 | 17 |
| | 4 | 0 | 0 | 30 | 0 | 0 | 30 |
| | 5 | 0 | 0 | 28 | 1 | 0 | 29 |
| | 6 | 11 | 0 | 7 | 10 | 43 | 71 |
| | 7 | 0 | 0 | 1 | 1 | 0 | 2 |
| | 8 | 33 | 0 | 3 | 24 | 21 | 81 |
| | 9 | 0 | 0 | 0 | 8 | 1 | 9 |
| | 10 | 31 | 82 | 2 | 36 | 13 | 164 |
| Total | | 82 | 82 | 82 | 82 | 82 | 410 |

## Notable Findings for Q2d:

- 100% (n=82) of Miller's applicants received a perfect score.
- Only 1 of Roman's applicants received a perfect score (application #88 – Natural State Medicinals Cultivation).
- <44% of applicants received a perfect score from other judges.
- Carroll and Henry-Tillman did not statistically differ from one another on Q2d but did differ from all other judges. Roman, Story, and Miller statistically differed from all other judges independently.

### Homogeneous Subsets

**Ability to Operate: Packing Reqs**

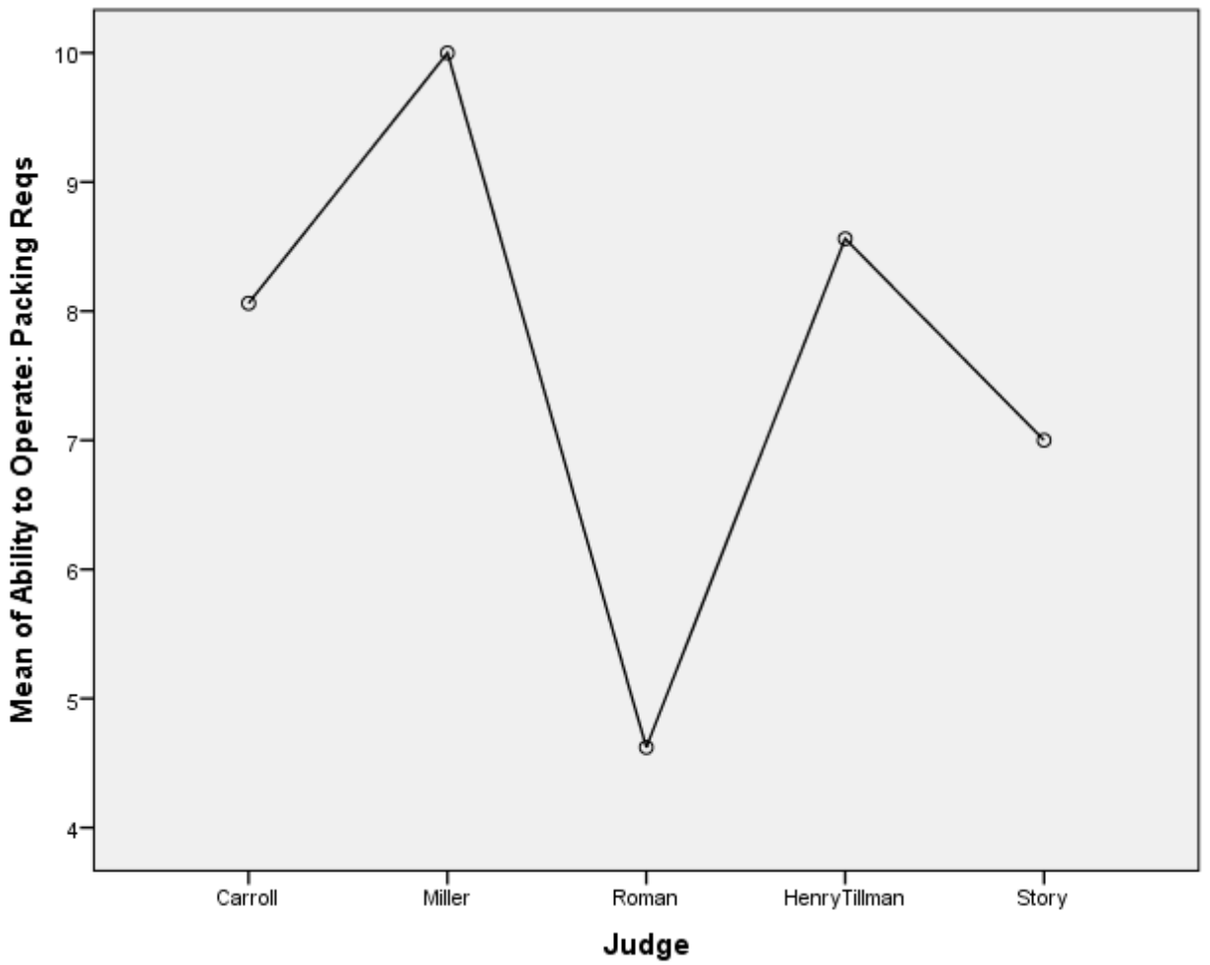
Tukey HSD[a]

| | | Subset for alpha = 0.05 | | | |
|---|---|---|---|---|---|
| Judge | N | 1 | 2 | 3 | 4 |
| Roman | 82 | 4.62 | | | |
| Story | 82 | | 7.00 | | |
| Carroll | 82 | | | 8.06 | |
| HenryTillman | 82 | | | 8.56 | |
| Miller | 82 | | | | 10.00 |
| Sig. | | 1.000 | 1.000 | .268 | 1.000 |

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 82.000.

**Means Plots**


Mean of Ability to Operate: Packing Reqs
10
9
8
7
6
5
4
Carroll
Miller
Roman
HenryTillman
Story
Judge

# Question 2e

**2e Ability to Operate: Transport Reqs * Judge Crosstabulation**

Count

| | | Judge | | | | | |
|---|---|---|---|---|---|---|---|
| | | Carroll | Miller | Roman | HenryTillman | Story | Total |
| 2e Ability to Operate: Transport Reqs | 0 | 1 | 0 | 1 | 0 | 2 | 4 |
| | 1 | 0 | 0 | 1 | 0 | 0 | 1 |
| | 3 | 3 | 0 | 8 | 4 | 13 | 28 |
| | 4 | 0 | 0 | 23 | 0 | 0 | 23 |
| | 5 | 9 | 0 | 28 | 4 | 37 | 78 |
| | 6 | 0 | 0 | 10 | 3 | 0 | 13 |
| | 7 | 41 | 0 | 7 | 19 | 18 | 85 |
| | 8 | 0 | 0 | 3 | 11 | 0 | 14 |
| | 9 | 28 | 82 | 1 | 41 | 12 | 164 |
| Total | | 82 | 82 | 82 | 82 | 82 | 410 |

## Notable Findings for Q2e:

- 100% (n=82) of Miller's applicants received a perfect score.
- Only 1 of Roman's applicants received a perfect score (application #177 – Mothers Accountable for Marijuana).
- ≤50% of applicants received a perfect score from other judges.
- Carroll and Henry-Tillman did not statistically differ from one another on Q2e but did differ from all other judges. Roman, Story, and Miller statistically differed from all other judges independently.

### Homogeneous Subsets

**Ability to Operate: Transport Reqs**

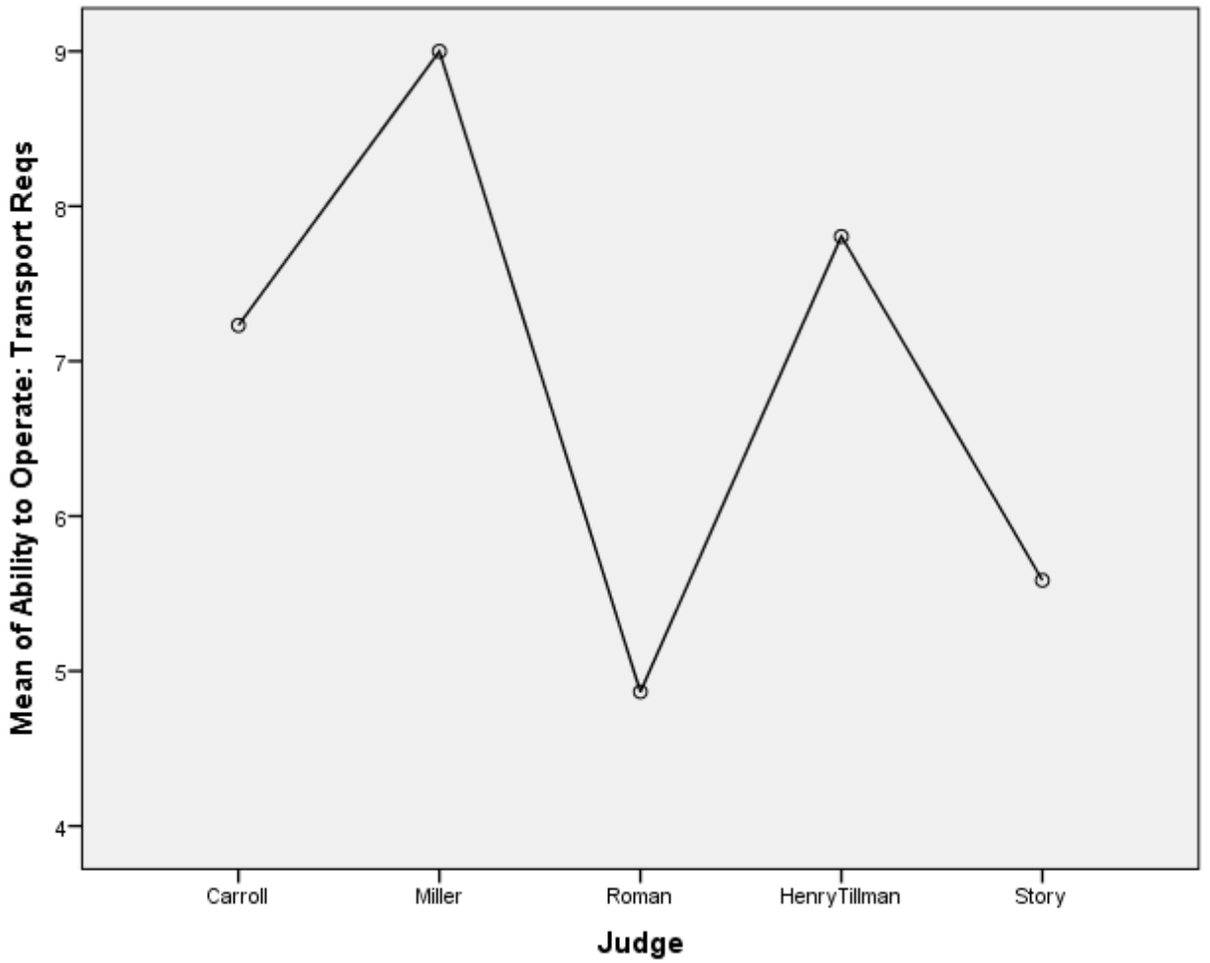
Tukey HSD[a]

| | | Subset for alpha = 0.05 | | | |
|---|---|---|---|---|---|
| Judge | N | 1 | 2 | 3 | 4 |
| Roman | 82 | 4.87 | | | |
| Story | 82 | | 5.59 | | |
| Carroll | 82 | | | 7.23 | |
| HenryTillman | 82 | | | 7.80 | |
| Miller | 82 | | | | 9.00 |
| Sig. | | 1.000 | 1.000 | .121 | 1.000 |

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 82.000.

**Means Plots**


Mean of Ability to Operate: Transport Reqs
9
8
7
6
5
4
Carroll
Miller
Roman
HenryTillman
Story
Judge

## Question 3a

**3a Operations Plan: Business * Judge Crosstabulation**

| | | Judge | | | | | |
|---|---|---|---|---|---|---|---|
| | | Carroll | Miller | Roman | HenryTillman | Story | Total |
| 3a Operations Plan: Business | 0 | 1 | 0 | 1 | 0 | 1 | 3 |
| | 3 | 0 | 0 | 7 | 0 | 0 | 7 |
| | 4 | 0 | 0 | 6 | 0 | 0 | 6 |
| | 5 | 1 | 12 | 6 | 2 | 6 | 27 |
| | 6 | 0 | 0 | 5 | 0 | 0 | 5 |
| | 7 | 0 | 0 | 4 | 0 | 0 | 4 |
| | 8 | 0 | 0 | 8 | 8 | 0 | 16 |
| | 9 | 0 | 0 | 17 | 0 | 0 | 17 |
| | 10 | 11 | 36 | 16 | 11 | 39 | 113 |
| | 11 | 0 | 0 | 4 | 0 | 0 | 4 |
| | 12 | 0 | 0 | 5 | 7 | 0 | 12 |
| | 13 | 32 | 16 | 1 | 3 | 29 | 81 |
| | 14 | 0 | 0 | 0 | 24 | 0 | 24 |
| | 15 | 0 | 0 | 1 | 0 | 0 | 1 |
| | 16 | 37 | 18 | 1 | 27 | 7 | 90 |
| Total | | 82 | 82 | 82 | 82 | 82 | 410 |

**Notable Findings for Q3a:**

- Only 1 of Roman's applicants received a perfect score (application #88 – Natural State Medicinals Cultivation).
- Story and Miller did not statistically differ from one another, but differ from all other judges. Henry-Tillman and Carroll did not statistically differ from one another but did differ from all other judges. Roman statistically differed from all other judges on Q3a.

## Homogeneous Subsets

**Operations Plan: Business**

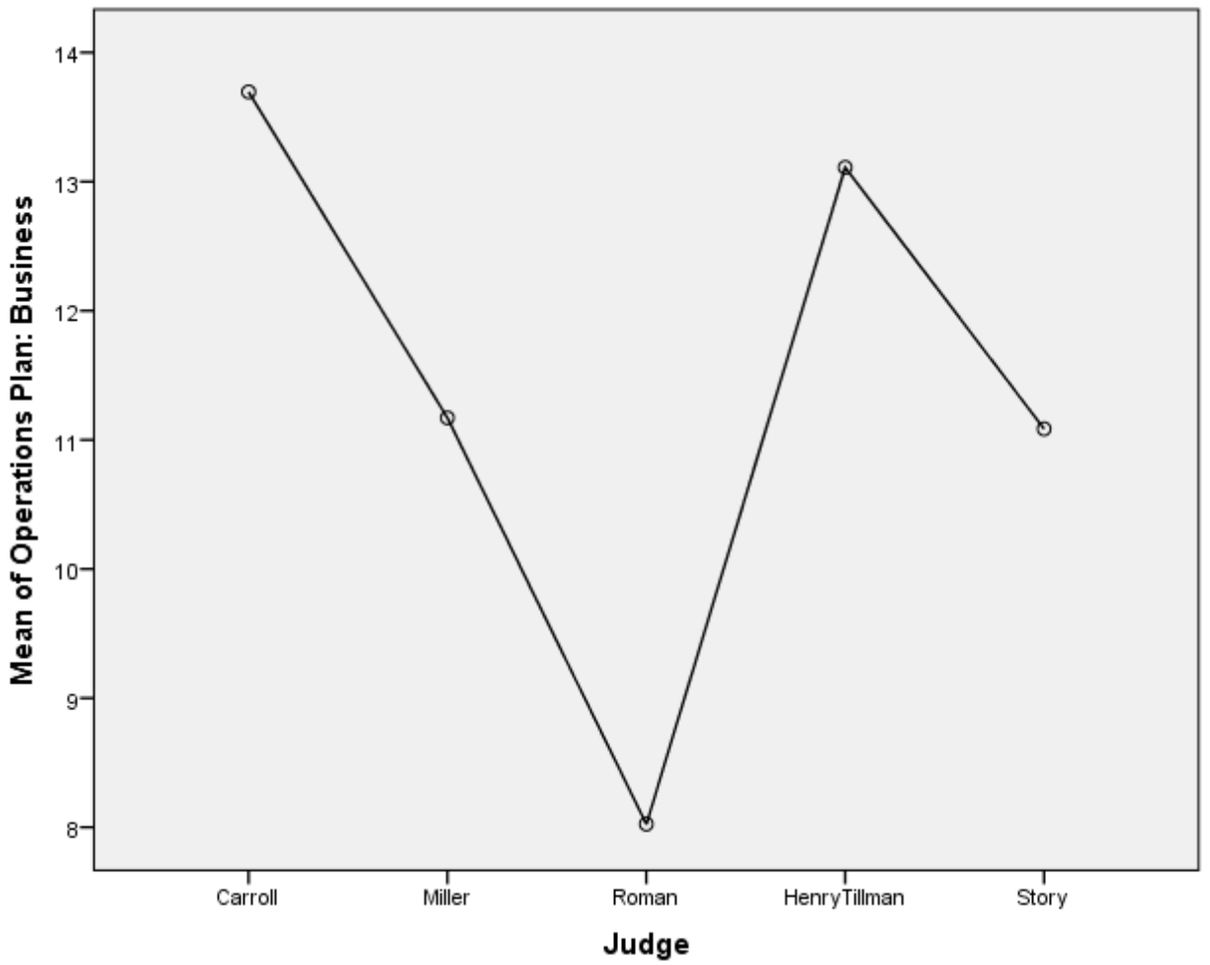
Tukey HSD[a]

| Judge | N | Subset for alpha = 0.05 | | |
|---|---|---|---|---|
| | | 1 | 2 | 3 |
| Roman | 82 | 8.02 | | |
| Story | 82 | | 11.09 | |
| Miller | 82 | | 11.17 | |
| HenryTillman | 82 | | | 13.11 |
| Carroll | 82 | | | 13.70 |
| Sig. | | 1.000 | 1.000 | .730 |

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 82.000.

## Means Plots



## Question 3b

**3b Operations Plan: Timeline * Judge Crosstabulation**

Count

| | | Judge | | | | | |
|---|---|---|---|---|---|---|---|
| | | Carroll | Miller | Roman | HenryTillman | Story | Total |
| 3b Operations Plan: Timeline | 0 | 1 | 3 | 1 | 0 | 5 | 10 |
| | 1 | 0 | 1 | 1 | 0 | 7 | 9 |
| | 2 | 2 | 2 | 48 | 39 | 35 | 126 |
| | 3 | 15 | 27 | 24 | 3 | 31 | 100 |
| | 4 | 64 | 49 | 8 | 40 | 4 | 165 |
| Total | | 82 | 82 | 82 | 82 | 82 | 410 |

## Notable Findings for Q3b:

- 78% (n=64) of Carroll's applicants received a perfect score.
- Story and Roman did not statistically differ from each other on Q3b but did differ from all other judges. Miller and Carroll did not statistically differ from one another but did differ from all other judges. Henry-Tillman statistically differed from all other judges.

### Homogeneous Subsets

**Operations Plan: Timeline**

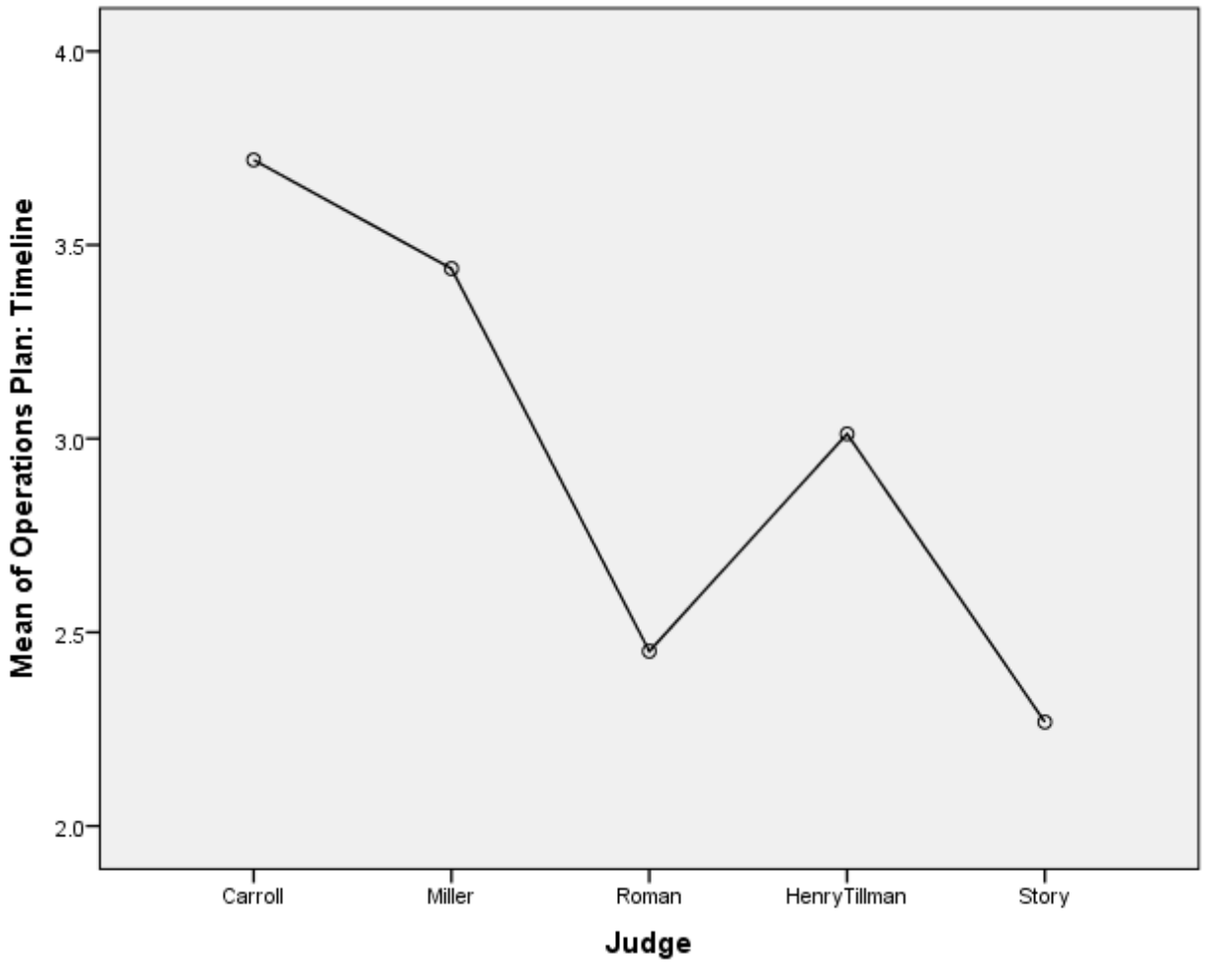
Tukey HSD[a]

| Judge | N | Subset for alpha = 0.05 | | |
|---|---|---|---|---|
| | | 1 | 2 | 3 |
| Story | 82 | 2.27 | | |
| Roman | 82 | 2.45 | | |
| HenryTillman | 82 | | 3.01 | |
| Miller | 82 | | | 3.44 |
| Carroll | 82 | | | 3.72 |
| Sig. | | .638 | 1.000 | .213 |

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 82.000.

**Means Plots**


Mean of Operations Plan: Timeline
4.0
3.5
3.0
2.5
2.0
Carroll
Miller
Roman
HenryTillman
Story
Judge

## Question 4

**4 Financial Disclosure * Judge Crosstabulation**

Count

| | | Judge | | | | | |
|---|---|---|---|---|---|---|---|
| | | Carroll | Miller | Roman | HenryTillman | Story | Total |
| 4 Financial Disclosure | 0 | 0 | 1 | 3 | 0 | 4 | 8 |
| | 1 | 0 | 0 | 1 | 0 | 0 | 1 |
| | 2 | 0 | 0 | 1 | 2 | 0 | 3 |
| | 3 | 0 | 4 | 8 | 0 | 8 | 20 |
| | 4 | 0 | 0 | 18 | 1 | 0 | 19 |
| | 5 | 0 | 0 | 21 | 30 | 0 | 51 |
| | 6 | 7 | 14 | 5 | 8 | 35 | 69 |
| | 7 | 0 | 0 | 7 | 2 | 0 | 9 |
| | 8 | 21 | 18 | 10 | 24 | 22 | 95 |
| | 9 | 0 | 0 | 4 | 0 | 0 | 4 |
| | 10 | 54 | 45 | 4 | 15 | 13 | 131 |
| Total | | 82 | 82 | 82 | 82 | 82 | 410 |

**Notable Findings for Q4:**

- 5% (n=4) of Roman's applicants received a perfect score (Application #88 – Natural State Medicinals Cultivation; Application #23 – Natural State Agronomics; Application #123 – Natural State Wellness Enterprises (Jef); Application #124 – Natural State Wellness Enterprises (Jac)).
- Story and Henry-Tillman did not statistically differ from one another but did differ from all other judges. Miller and Carrol did not statistically differ from one another but did differ from all other judges. Roman statistically differed from all other judges for Q4.

## Homogeneous Subsets

**Financial Disclosure**

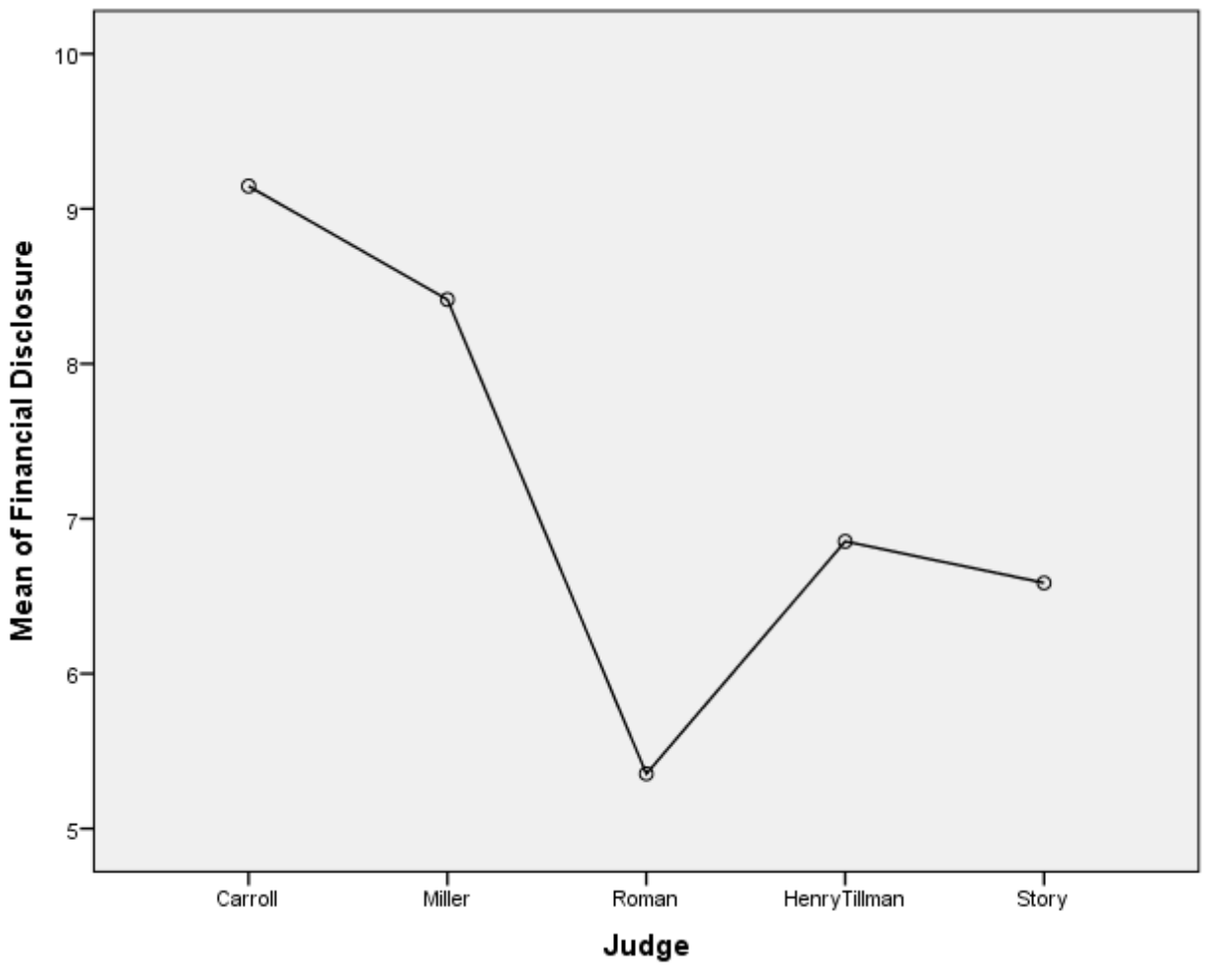
Tukey HSD[a]

| Judge | N | Subset for alpha = 0.05 | | |
|---|---|---|---|---|
| | | 1 | 2 | 3 |
| Roman | 82 | 5.35 | | |
| Story | 82 | | 6.59 | |
| HenryTillman | 82 | | 6.85 | |
| Miller | 82 | | | 8.41 |
| Carroll | 82 | | | 9.15 |
| Sig. | | 1.000 | .924 | .168 |

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 82.000.

## Means Plots



**Notable Findings on Overall Analysis:**

- Analyses were conducted only on commissioner scored questions (1-4, totaling 9 sections: 1, 2a, 2b, 2c, 2d, 2e, 3a, 3b, 4).
- Of the scorecards that were provided for analysis (5 applicants, totaling 25 scorecards), three different scorecards were identified. One type provided the judge with score ranges per category, the second type provided the judge with a maximum score allowed and no ranges, and the third observed type did not provide the judge with any ranges or maximums in the scoring section. Furthermore, the categories were not mutually exclusive; meaning, a "Qualified" category might range from 3-6 points, but on another scorecard, the "Underqualified" category for the same question might be a maximum of 3 points, not allowing the judge a consistent scoring for an applicant who they may consider to be "Qualified." This resulted in potential skewing of results. Because of the few examples of actual scorecards provided for analysis, it is unknown as to whether or not these were the only versions. Examples from actual scorecards are below.

*(Note: Commissioner's name and applicant's score were erased for confidentiality purposes.)*

Scorecard Example 1:

| Commissioner | Unqualifie | Underqualifi | Qualified | Very Qualifie | Extremely Qual |
|---|---|---|---|---|---|
| Schedule 1 - Qualifications of Applicant (10) | 0 | 1-2 | 3-6 | 7-8 | 9-10 |
| Education and business experience of the applicant including experience with regulated industries, agriculture or horticulture, commercial manufacturing, secure inventory tracking and control, cultivation of medical marijuana, 24 Hour security businesses, and creation and implementation of a business or financial plan | | | | | |

Scorecards Example 2:

| Commissioner | Unqualified | Underqualified | Qualified | Very Qualified | Extremely Qualified |
|---|---|---|---|---|---|
| Schedule 1 - Qualifications of Applicant (10) | 0 | 3 | 6 | 8 | 10 |
| Education and business experience of the applicant including experience with regulated industries, agriculture or horticulture, commercial manufacturing, secure inventory tracking and control, cultivation of medical marijuana, 24 Hour security businesses, and creation and implementation of a business or financial plan | | | | | |
| Schedule 2 - Ability to Operate (50) | Unqualified | Underqualified | Qualified | Very Qualified | Extremely Qualified |

Scorecard Example 3:

| Commissioner | Unqualified | Underqualified | Qualified | Very Qualified | Extremely Qualified |
|---|---|---|---|---|---|
| Schedule 1 - Qualifications of Applicant (10) | | | | | |
| Education and business experience of the applicant including experience with regulated industries, agriculture or horticulture, commercial manufacturing, secure inventory tracking and control, cultivation of medical marijuana, 24 Hour security businesses, and creation and implementation of a business or financial plan | | | | | |

- For Q3b, all judges had the same options with the exception of those without numbers at all.

- Carroll and Miller gave category maximums (no ranges) 100% of the time, indicating these judges may have not been aware of a scale option within each category to score the applicants. This could also be a consequence of their total score means not being statistically different from one another. This could also possibly inflate the scoring overall.
- Story gave category scaled scores (not maximums) less than 1% of the time (5 scaled scores, over 4 questions, across 3 applications), indicating either the knowledge of scale options for some applicants, different scorecards between the applicants, or merely erroneous scoring. Of the 5 times that Story gave a score that was not a score maximum, 3 times was for one applicant (application #9) and twice for two other applicants (application #285 and application #109).
- Roman consistently used scaled scoring throughout the applications, indicating the knowledge of the scaled options for scoring. This could also be a consequence of the significant total score mean differences between judges.
- Henry-Tillman gave category scaled scores less than 25% of the time (156 scaled scores, over 6 questions, across 69 applications), indicating either the knowledge of range options for some applicants or different scorecards between applicants. Approximately 60% (n=43) of those 69 applicants received a scaled score more than once. Further, approximately 15% of all applications received category maximums from Henry-Tillman.
- Roman was the only judge to use scaled scoring on Q1. All other judges gave category maximums 100% of the time.

**Count of Scaled Scores by Question by Judge**

| | Judge | | | | | Total |
|---|---|---|---|---|---|---|
| | **Carroll** | **Miller** | **Roman** | **HenryTillman** | **Story** | |
| Q1 | 0 | 0 | 36 | 0 | 0 | 36 |
| Q2 | 0 | 0 | 52 | 8 | 1 | 61 |
| Q2b | 0 | 0 | 58 | 36 | 1 | 95 |
| Q2c | 0 | 0 | 35 | 14 | 2 | 51 |
| Q2d | 0 | 0 | 65 | 10 | 1 | 76 |
| Q2e | 0 | 0 | 37 | 14 | 0 | 51 |
| 3a | 0 | 0 | 53 | 39 | 0 | 92 |
| 3b | --- | --- | --- | --- | --- | --- |
| 4 | 0 | 0 | 52 | 35 | 0 | 87 |
| Total | 0 | 0 | 388 | 156 | 5 | 549 |

- Of the 3,280 possible scores (8 questions across 82 applicants from 5 judges), only 549 scores were scaled. Of those 549 scaled scores, Roman made up of 71% (n = 388). This could indicate either issues with the validity and/or reliability of the instrument or be a consequence of lacking instrument standardization. Using multiple instruments across for the same assessment can severely influence results.

**Noteworthy Data Points:**

Ranges:

- Scores ranged greatly on all commissioner evaluated questions. Of the 9 questions evaluated, 6 had score ranges that were maximized. Meaning, at least one judge gave an applicant a zero while at least one other judge gave the same applicant a perfect score on the same question. Below is the count of times an applicant had one of the top two highest ranges out of the nine questions. Additionally, listed is the most frequent applicant that had the smallest two ranges per question. Both charts list all applicants with three or more occurrences.
- The most noteworthy applications to illustrate the ranges are:
    - Application #101 were found in the top 2 largest ranges for all 9 questions. In four of the 9 instances at least one judge gave them a perfect score while another gave them a zero on the same question. Out of the 9 questions evaluated by the commissioners, Story gave this applicant 6 zeros (total subscore = 9). Roman gave this applicant 4 zeros (total subscore = 12). The average score of the other three judges was 64 for the first 9 questions for this applicant.
    - Application #88 had 7 instances where they had the lowest range of all applicants. All judges scored the maximum on three of the 9 questions.

| Application # | # of times with the 1st or 2nd largest range |
|---|---|
| 101 | 9 |
| 4 | 4 |
| 182 | 4 |
| 235 | 4 |
| 238 | 4 |
| 248 | 4 |
| 51 | 3 |
| 92 | 3 |
| 130 | 3 |
| 140 | 3 |

| Application # | # of times with the last or second to last smallest range |
|---|---|
| 88 | 9 |
| 27 | 4 |
| 26 | 3 |
| 70 | 3 |
| 164 | 3 |
| 180 | 3 |
| 208 | 3 |

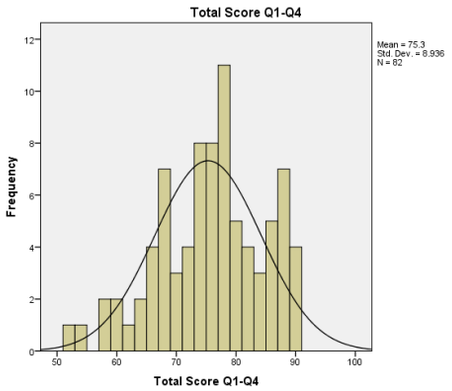
Variances:

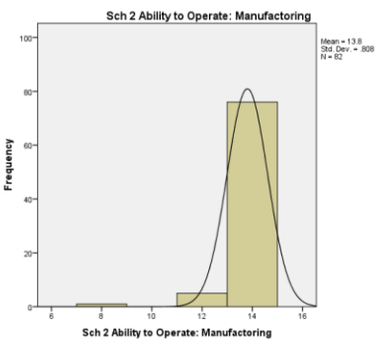
- Variances are calculated using the mean of each question subtracted from the judges original score for that question, squared, then averaged. This helps determine how big of a difference the judges are from the average. The larger the variance, the further away the judge's score is from the mean.
- Looking at the top five largest variances for each question, the applications worth noting are:
    - Applicant #101 had 8 instances where they had the top 5 largest variances across 9 questions.
    - Applicants #51 and #93 both had three instances they were in the top 5 largest variances for three questions.

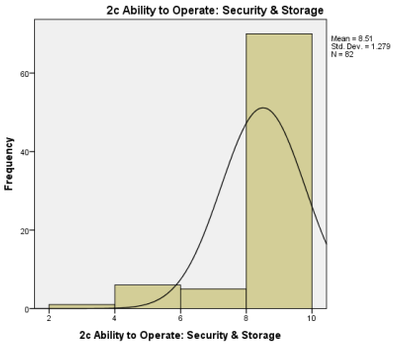
| Application # | # of times applicant was top 5 largest in variance |
|---|---|
| 101 | 8 |
| 51 | 3 |
| 93 | 3 |

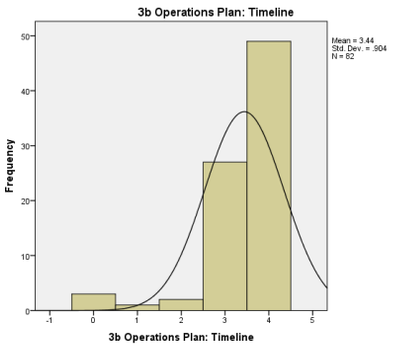
Miller's Scores:

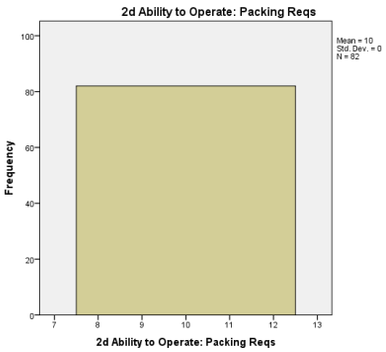
- Though Miller's total scores appear normally distributed when graphed, when you examine each individual question, you can see that the scores are heavily weighted to one side. This increases the Kurtosis statistic above three on 3 of the 9 questions. This means that there is heavy skewing of the results from what should be normally distributed. Two of the remaining 6 questions (2d and 2e) are scored the same between all applicants.

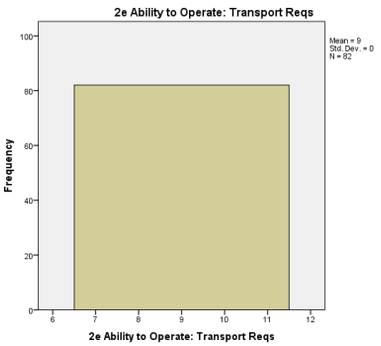


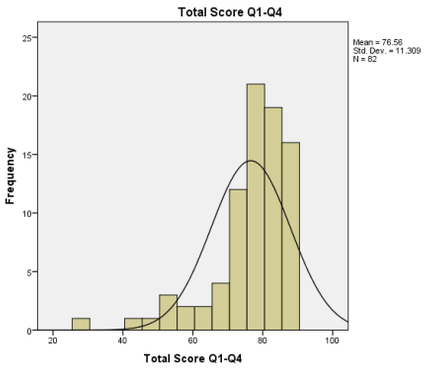



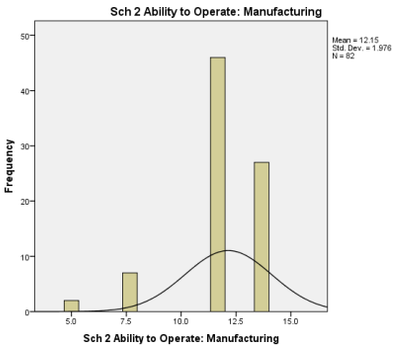



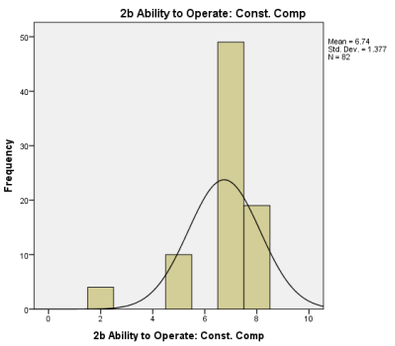



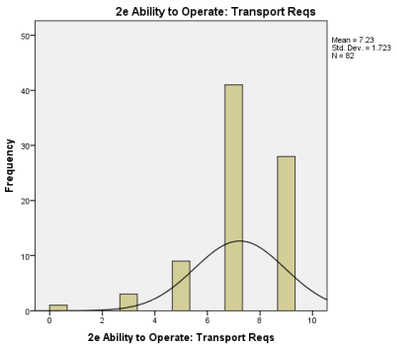
Carroll's Scores:

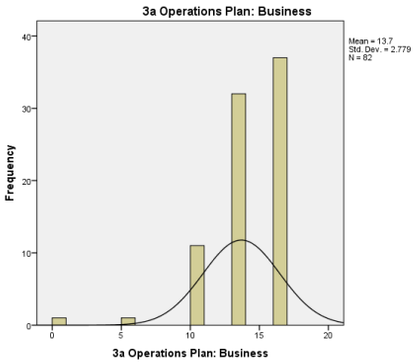
- Unlike Miller's overall scores for Q1-Q4, Carroll's overall scores are heavily skewed; meaning the scores lack symmetry. The Kurtosis statistic is 4.2, which indicates that the overall scores are heavily weighted in the tails of the distribution curve and therefore outliers in the scoring are present. Carroll has abnormally large Kurtosis statistics on 5 of the 9 scored questions (Q2a, Q2b, Q2e, 3a, 3b) in addition to the overall score.

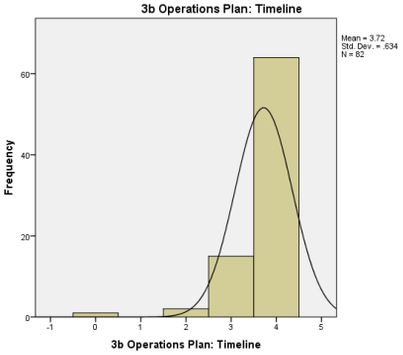


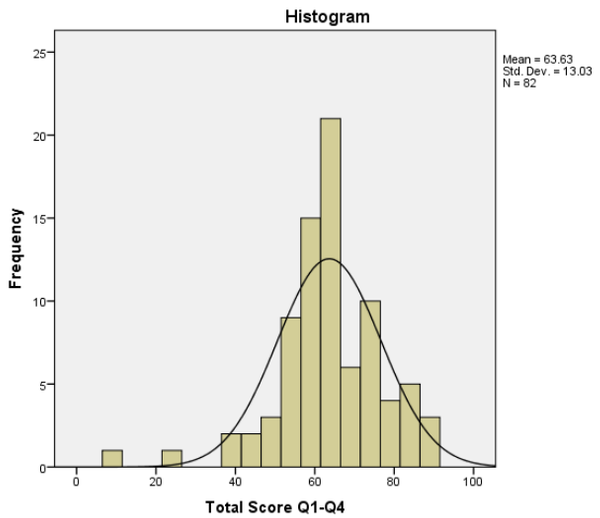



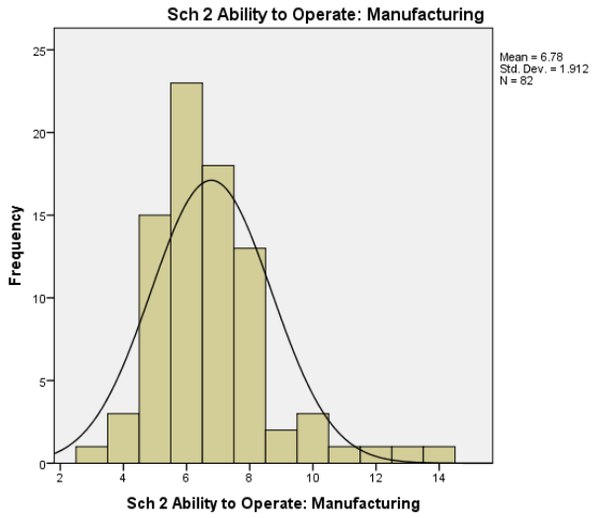
Story's Scores:

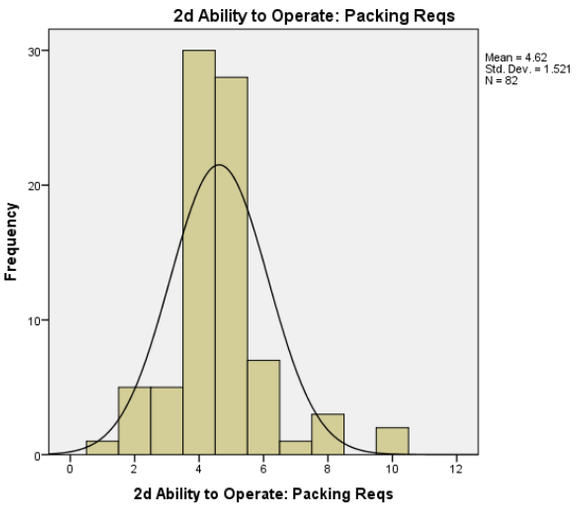
- Story's overall scores for Q1-Q4 are heavily skewed, with a Kurtosis statistic of 3.4. This indicates that the overall scores are heavily weighted in the tails of the distribution curve and therefore outliers in the scoring are present.




Roman's Scores:

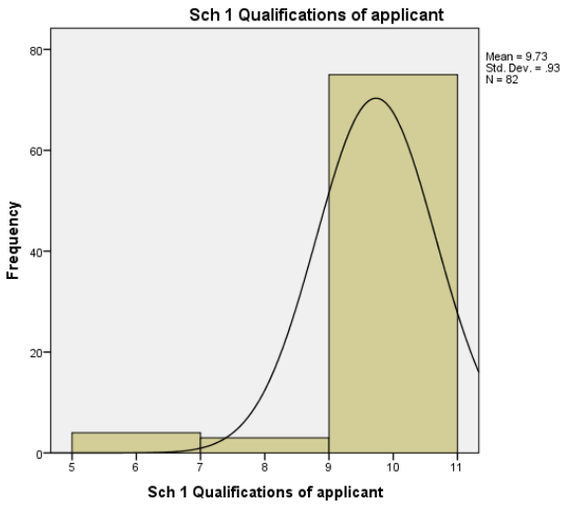
- Roman's scores were heavily weighted on two questions (2a and 2d), based on the Kurtosis statistic for each question. This indicates that those two scores are heavily weighted in the tails of the distribution curve and therefore outliers in the scoring are present.

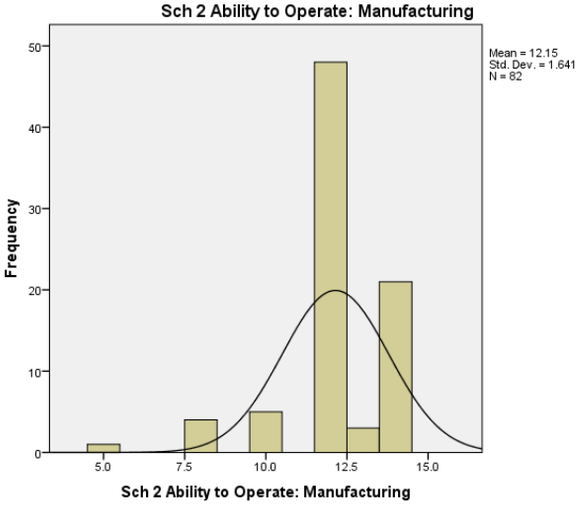


Henry-Tillman's Scores:

- Henry-Tillman's overall scores have a Kurtosis statistic approaching 3, indicating there are potential outliers present in the scoring. However, when examining each question individually, two questions (Q1 and Q2a) are heavily weighted based on the Kurtosis statistic.



Perfect Score Variances:

- Each judge gave a total of 738 scores across 9 questions for 82 applicants.
- The variances between the judges count of perfect scores given varied significantly. Below is the count and percent for each judge.

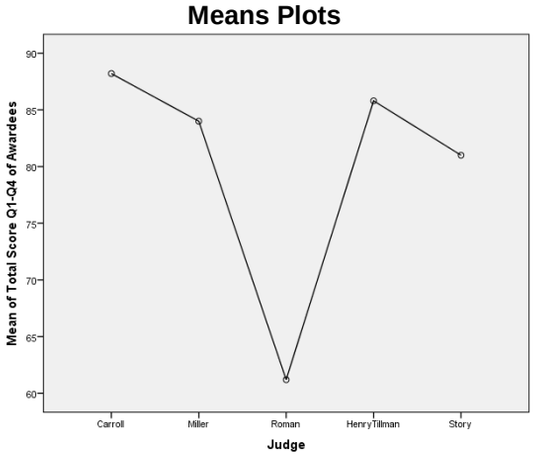
**Perfect Scores**

| | Count | % |
|---|---|---|
| **Roman** | 21 | 3% |
| **Story** | 118 | 16% |
| **Carroll** | 316 | 43% |
| **Henry-Tillman** | 323 | 44% |
| **Miller** | 462 | 63% |

- Of the 21 perfect scores given by Roman, 7 (33%) were given to one applicant (Application #88 – Natural State Medicinals Cultivation).
- From all the applications scored (N=410), 72 did not receive a perfect score on any question. Of those, Roman gave 67 (93%) applications less than a perfect score on all questions.
- Of the 72 applications that did not receive a perfect score on any question, 33 (46%) of them were Roman independently; meaning, Roman was the only one who gave 33 applicants less than a perfect score across all questions.

Assessment of Awarded Applicants:

- When examining the mean scores of the awarded applicants between judges, significant differences were found between Roman and the other 4 judges. The other 4 judges' means ranged from 81 to 88 points (for Q1-Q4) while Roman's mean was 61. However, one of the awarded applicants received 88 points from Roman, which falls in line with the other judges. Roman's mean for the remaining 4 awarded applicants was 55 points, while the other 4 judges averaged 84 points for those same applicants. This would indicate bias or lack of standardization between the judges.
- It is unknown if these same 5 applicants would have been awarded a license if the judges had a standard and uniform method of scoring all applicants.
- Additionally, Roman's significantly lower mean could be due to the fact that he used ranged scoring rather than category maximums as some of the other judges.



- Because Story and Roman were consistent outliers in their scoring, an analysis was conducted to examine the overall scores when removing the outlier judges. Using the other three judges scores, it was determined that the awardees would have differed from what was originally derived. Another analysis was conducted by replacing Roman and Story's total score with the mean scores of the other three judges. Again, the results of the 5 highest scores, or awardees, differed from what was originally derived.

## Executive Summary

Instrumentation:
The data indicate the methods in which the applications were scored were inconsistent. Meaning, the instrument (scorecard) used by the judges was flawed, not only because there were multiple versions between judges, but because those multiple versions statistically influenced the judges' scores. Significant differences in overall scores between judges indicates that the instrument used was not validated, or properly validated, in an effort to increase its internal reliability. Though this instrument was not a mandated tool for the judges to use, it is apparent that each judge used them for assessing each application; therefore, the instrument became the standard and comparisons were able to be drawn.

Scoring Methods:
With regard to the standardization of scoring methods between judges, the data indicate that scores were distributed in an inconsistent manner, demonstrating either bias or lack of standardization as to what constitutes an appropriate score for the categories given. These data further support the lack of validity and reliability of the scorecards used and the varying methods in which the judges scored the applications.

Additionally, Miller gave all applicants perfect scores for 2 questions and overall 63% of the time. While Roman gave perfect scores only 3% of the time and primarily only to one applicant. This further illustrates that significant differences exist in the scoring methodology that statistically skewed the results. It is inconclusive as to which applicants are the appropriate awardees based on the statistically significant findings presented in this report. But it has also shown, when simulating a validated instrument by normalizing the scoring, the awardees would have differed from what was originally derived.