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HAMILTON COUNTY JUDGES

STATISTICAL METHODS AND DECISION MAKING - A MANAGERIAL REPORT

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HAMILTON COUNTY JUDGES CASE – THE PROBLEM

Hamilton County judges try thousands of cases per year. In an overwhelming majority of cases disposed, the verdict stands are rendered. However, some cases are appealed, and of those appealed, some of the cases are reversed. Kristen Deglaze of the The Cincinnati Enquirer conducted a study of cases handled by Hamilton County judges over the years 1994 through 1997 (The Cincinnati Enquirer, January 11, 1998). Shown in Data File [Judge.xls](#) View in a new window are the results for 182,908 cases handled (disposed) by 38 judges in Common Pleas Court, Domestic Relations Court and Municipal Court. Two of the judges (Dinkelacker and Hogan) did not serve in the same court for the entire three-year period.

The purpose of the newspaper's study was to evaluate the performance of the judges. Appeals are often the result of mistakes made by judges and the newspaper wanted to know which judges were doing a good job and which were making too many mistakes. You have been called in to assist in the data analysis. Use your knowledge of probability and conditional probability to help with the ranking of the judges. You also may be able to analyze the likelihood of cases handled by different courts being appealed and reversed.

Prepare a report with your rankings of the judges. Also, include an analysis of the likelihood of appeal and case reversal in the three courts. At a minimum your report should include the following:

The probability of cases being appealed and reversed in the three different courts

The probability of a case being appealed for each judge

The probability of a case being reversed for each judge

The probability of reversal given an appeal for each judge

Rank the judges within each court. State the criteria you used and provide a rationale for your choice.

ADOPTED METHODOLOGY

Based on the available data and data analysis regarding Hamilton County Judges in three different courts, the judges can be ranked appropriately by their probability to be appealed cases, reversed cases and combination of the both. With the help statistics and probability the calculations are made to arrive at:

- i. The probability of appeal, rank by probability of appeal,
- ii. The probability of reversal, rank by probability of reversal,
- iii. The conditional probability of reversal given appeal, rank by conditional probability of reversal given appeal and overall sum of ranks.

Those judges who rank highest (i.e., 1st, 2nd, 3rd...) have the lowest probability to have appealed cases, reversed cases and lowest conditional probability of reversed cases given appeal.

By ranking the judges, we can arrive at 'To what extent Judges' judgements are accepted?' there by arrive at the effectiveness of the judgement made by these judges. Effort has also been made to show analysis which interprets who is the most effective judges overall.

3 different courts have been ranked: Common Court, Domestic Court and Municipal Court. The overall rankings are arrived at by summing up all of the rankings by all of the three probability variables to arrive at the most efficient judges among the three courts.

DATA ANALYSIS

1. PROBABILITY OF CASES APPEALED AND REVERSED IN THREE COURTS

| Court | (1) Total Disposed Cases | (2) Total Appealed Cases | (3) Total Reversed Cases | (4) $P(R/A)$ $= (3)/(2)$ | (5) $P(A)$ $= (2)/(1)$ | (6) $P(A \text{ and } R)$ $= (4)*(5)$ |
|--------------------|-----------------------------------|-----------------------------------|-----------------------------------|--------------------------------|------------------------------|---|
| Common Court | 43945 | 1762 | 199 | 0.11294 | 0.04010 | 0.00453 |
| Domestic Court | 30499 | 106 | 17 | 0.16038 | 0.00348 | 0.00056 |
| Municipal Court | 108464 | 500 | 104 | 0.20800 | 0.00461 | 0.00096 |
| Grand Total | 182908 | 2368 | 320 | | | 0.00604 |

2. DATA ANALYSIS OF COMMON COURT

| Judge | Sum of Disposed | Sum of Appealed | Sum of Reversed | P(A) | P(R) | P(A and R) | Rank based on P(A) | Rank based on P(R) | Rank based on P(A and R) | Sum of Ranks |
|--------------------------|--------------------|--------------------|--------------------|--------|--------|---------------|--------------------------|--------------------------|-----------------------------|--------------------|
| Ann Marie Tracey | 3141 | 127 | 13 | 0.0404 | 0.1024 | 0.0041 | 9 | 7 | 8 | 24 |
| Arthur Ney Jr. | 3219 | 125 | 14 | 0.0388 | 0.1120 | 0.0043 | 5 | 8 | 9 | 22 |
| Fred Cartolano | 3037 | 137 | 12 | 0.0451 | 0.0876 | 0.0040 | 14 | 5 | 6 | 25 |
| J. Howard Sundermann Jr. | 955 | 60 | 10 | 0.0628 | 0.1667 | 0.0105 | 16 | 13 | 16 | 45 |
| John O'Connor | 2969 | 129 | 12 | 0.0434 | 0.0930 | 0.0040 | 12 | 6 | 7 | 25 |
| Norbert Nadel | 2959 | 131 | 20 | 0.0443 | 0.1527 | 0.0068 | 13 | 12 | 13 | 38 |
| Patrick Dinkelacker | 1258 | 44 | 8 | 0.0350 | 0.1818 | 0.0064 | 3 | 14 | 12 | 29 |
| Ralph Winkler | 3089 | 88 | 6 | 0.0285 | 0.0682 | 0.0019 | 1 | 3 | 1 | 5 |
| Richard Niehaus | 3353 | 137 | 16 | 0.0409 | 0.1168 | 0.0048 | 11 | 10 | 10 | 31 |
| Robert Kraft | 3138 | 127 | 7 | 0.0405 | 0.0551 | 0.0022 | 10 | 2 | 3 | 15 |
| Robert Ruehlman | 3205 | 145 | 18 | 0.0452 | 0.1241 | 0.0056 | 15 | 11 | 11 | 37 |
| Thomas Crush | 3372 | 119 | 10 | 0.0353 | 0.0840 | 0.0030 | 4 | 4 | 4 | 12 |

| | | | | | | | | | | |
|-------------------|------|-----|----|--------|--------|--------|---|----|----|----|
| Thomas Nurre | 3000 | 121 | 6 | 0.0403 | 0.0496 | 0.0020 | 8 | 1 | 2 | 11 |
| Timothy Hogan | 1954 | 60 | 7 | 0.0307 | 0.1167 | 0.0036 | 2 | 9 | 5 | 16 |
| William Mathews | 2264 | 91 | 18 | 0.0402 | 0.1978 | 0.0080 | 7 | 16 | 15 | 38 |
| William Morrissey | 3032 | 121 | 22 | 0.0399 | 0.1818 | 0.0073 | 6 | 14 | 14 | 34 |

3. DATA ANALYSIS OF DOMESTIC COURT

| Judge | Sum of Disposed | Sum of Appealed | Sum of Reversed | P(A) | P(R) | P(A and R) | Rank based on P(A) | Rank based on P(R) | Rank based on P(A and R) | Sum of Ranks |
|---------------------|-----------------|-----------------|-----------------|--------|--------|------------|--------------------|--------------------|--------------------------|--------------|
| Deborah Gaines | 8799 | 48 | 9 | 0.0055 | 0.1875 | 0.0010 | 4 | 3 | 4 | 11 |
| Patrick Dinkelacker | 6001 | 19 | 4 | 0.0032 | 0.2105 | 0.0007 | 3 | 4 | 3 | 10 |
| Penelope Cunningham | 2729 | 7 | 1 | 0.0026 | 0.1429 | 0.0004 | 2 | 2 | 2 | 6 |
| Ronald Panioto | 12970 | 32 | 3 | 0.0025 | 0.0938 | 0.0002 | 1 | 1 | 1 | 3 |

4. DATA ANALYSIS OF MUNICIPAL COURT

| Judge | Sum of Disposed | Sum of Appealed | Sum of Reversed | P(A) | P(R) | P(A and R) | Rank based on P(A) | Rank based on P(R) | Rank based on P(A and R) | Sum of Ranks |
|----------------------|-----------------|-----------------|-----------------|--------|--------|------------|--------------------|--------------------|--------------------------|--------------|
| Albert Mestemaker | 4975 | 28 | 9 | 0.0056 | 0.3214 | 0.0018 | 16 | 17 | 19 | 52 |
| Beth Mattingly | 2971 | 13 | 1 | 0.0044 | 0.0769 | 0.0003 | 10 | 3 | 3 | 16 |
| David Davis | 7736 | 43 | 5 | 0.0056 | 0.1163 | 0.0006 | 15 | 5 | 6 | 26 |
| David Stockdale | 5371 | 22 | 4 | 0.0041 | 0.1818 | 0.0007 | 7 | 11 | 9 | 27 |
| Deidra Hair | 2532 | 5 | 0 | 0.0020 | 0.0000 | 0.0000 | 3 | 1 | 1 | 5 |
| Dennis Helmick | 7900 | 29 | 5 | 0.0037 | 0.1724 | 0.0006 | 6 | 9 | 5 | 20 |
| Jack Rosen | 7790 | 41 | 13 | 0.0053 | 0.3171 | 0.0017 | 13 | 15 | 17 | 45 |
| James Patrick Kenney | 2798 | 6 | 1 | 0.0021 | 0.1667 | 0.0004 | 4 | 8 | 4 | 16 |
| John A. West | 2797 | 4 | 2 | 0.0014 | 0.5000 | 0.0007 | 2 | 20 | 8 | 30 |
| Joseph Luebbers | 4698 | 25 | 8 | 0.0053 | 0.3200 | 0.0017 | 14 | 16 | 18 | 48 |
| Karla Grady | 5253 | 6 | 0 | 0.0011 | 0.0000 | 0.0000 | 1 | 1 | 1 | 3 |

| | | | | | | | | | | |
|----------------------|------|----|----|--------|--------|--------|----|----|----|----|
| Leslie Isaiah Gaines | 5282 | 35 | 13 | 0.0066 | 0.3714 | 0.0025 | 19 | 18 | 20 | 57 |
| Mark Painter | 2239 | 7 | 3 | 0.0031 | 0.4286 | 0.0013 | 5 | 19 | 16 | 40 |
| Mark Schweikert | 5403 | 33 | 6 | 0.0061 | 0.1818 | 0.0011 | 18 | 11 | 15 | 44 |
| Melba Marsh | 8219 | 34 | 7 | 0.0041 | 0.2059 | 0.0009 | 8 | 13 | 12 | 33 |
| Mike Allen | 6149 | 43 | 4 | 0.0070 | 0.0930 | 0.0007 | 20 | 4 | 7 | 31 |
| Nadine Allen | 7812 | 34 | 6 | 0.0044 | 0.1765 | 0.0008 | 9 | 10 | 11 | 30 |
| Timothy Black | 7954 | 41 | 6 | 0.0052 | 0.1463 | 0.0008 | 12 | 6 | 10 | 28 |
| Timothy Hogan | 2308 | 13 | 2 | 0.0056 | 0.1538 | 0.0009 | 17 | 7 | 13 | 37 |
| William Mallory | 8277 | 38 | 9 | 0.0046 | 0.2368 | 0.0011 | 11 | 14 | 14 | 39 |

5. JUDGES WITH MAXIMUM EFFICIENCY WITH LOWEST PROBABILITY OF APPEALS AND REVERSALS

Based on the above Data Analysis, below are the judges who displayed the maximum efficiency in rendering judgements.

| Court | Judge |
|-----------------|-----------------------------|
| Common Court | Ralph Winkler |
| Domestic Court | Ronald Panioto |
| Municipal Court | Karla Grady and Deidra Hair |

INFERENCE

- Judge Ralph Winkler is the best Judge of Common Court;
- Ronald Panioto is the best Judge in Domestic Court; and
- Karla Grady has the best Judge in Municipal Court. Deidra Hair could also be place equivalent to Karla Grady.

ALTERNATE APPROACH

Alternatively, judges can also be ranked only on the basis of probability of reversals.

| Common Court Judges Ranking | | |
|-----------------------------|----------|------|
| Judge | P(R) | Rank |
| Ralph Winkler | 0.001942 | 1 |
| Thomas Nurre | 0.002000 | 2 |
| Robert Kraft | 0.002231 | 3 |
| Thomas Crush | 0.002966 | 4 |
| Timothy Hogan | 0.003582 | 5 |
| Fred Cartolano | 0.003951 | 6 |
| John O'Connor | 0.004042 | 7 |
| Ann Marie Tracey | 0.004139 | 8 |
| Arthur Ney Jr. | 0.004349 | 9 |
| Richard Niehaus | 0.004772 | 10 |
| Robert Ruehlman | 0.005616 | 11 |
| Patrick Dinkelacker | 0.006359 | 12 |
| Norbert Nadel | 0.006759 | 13 |
| William Morrissey | 0.007256 | 14 |
| William Mathews | 0.007951 | 15 |
| J. Howard Sundermann Jr. | 0.010471 | 16 |

| Domestic Court Judges Ranking | | |
|-------------------------------|----------|------|
| Judge | P(R) | Rank |
| Ronald Panioto | 0.000231 | 1 |
| Penelope Cunningham | 0.000366 | 2 |
| Patrick Dinkelacker | 0.000667 | 3 |
| Deborah Gaines | 0.001023 | 4 |

| Municipal Court Judges Ranking | | |
|--------------------------------|---------|------|
| Judge | P(R) | Rank |
| Deidra Hair | 0.00000 | 1 |
| Karla Grady | 0.00000 | 1 |
| Beth Mattingly | 0.07692 | 3 |
| Mike Allen | 0.09302 | 4 |
| David Davis | 0.11628 | 5 |
| Timothy Black | 0.14634 | 6 |
| Timothy Hogan | 0.15385 | 7 |
| James Patrick Kenney | 0.16667 | 8 |
| Dennis Helmick | 0.17241 | 9 |
| Nadine Allen | 0.17647 | 10 |
| David Stockdale | 0.18182 | 11 |
| Mark Schweikert | 0.18182 | 11 |
| Melba Marsh | 0.20588 | 13 |
| William Mallory | 0.23684 | 14 |
| Jack Rosen | 0.31707 | 15 |
| Joseph Luebbers | 0.32000 | 16 |
| Albert Mestemaker | 0.32143 | 17 |
| Leslie Isaiah Gaines | 0.37143 | 18 |
| Mark Painter | 0.42857 | 19 |
| John A. West | 0.50000 | 20 |

It is interesting to note that the ranking of judges still remain the same. However, as per the earlier approach, whilst considering the Municipal court judges Deidra and Karla their have probabilities of appeal 0.0020 and 0.0011 respectively showing Deidra holds greater probability for appeal which in turn could cascade as a greater chance for reversal as well.