Database

Regression Analysis: opioid medication usage versus Average self-report pain scores, Age Group, Family history, Opioid OD Yes/No

**Method**

|  |  |
| --- | --- |
| Categorical predictor coding | (1, 0) |

**Regression Equation**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Age Group** | **Family history** | **Opioid OD Yes/No** |  |  |  |
| < 18 | No | No | opioid medication usage | = | 6.573 + 7.715 Average self-report pain scor es |
|  |  |  |  |  |  |
| < 18 | No | Yes | opioid medication usage | = | 20.789 + 7.715 Average self-report pain scor es |
|  |  |  |  |  |  |
| < 18 | Yes | No | opioid medication usage | = | 10.552 + 7.715 Average self-report pain scor es |
|  |  |  |  |  |  |
| < 18 | Yes | Yes | opioid medication usage | = | 24.77 + 7.715 Average self-report pain scor es |
|  |  |  |  |  |  |
| 18-24 | No | No | opioid medication usage | = | 7.195 + 7.715 Average self-report pain scor es |
|  |  |  |  |  |  |
| 18-24 | No | Yes | opioid medication usage | = | 21.41 + 7.715 Average self-report pain scor es |
|  |  |  |  |  |  |
| 18-24 | Yes | No | opioid medication usage | = | 11.17 + 7.715 Average self-report pain scor es |
|  |  |  |  |  |  |
| 18-24 | Yes | Yes | opioid medication usage | = | 25.39 + 7.715 Average self-report pain scor es |
|  |  |  |  |  |  |
| 25-44 | No | No | opioid medication usage | = | 7.253 + 7.715 Average self-report pain scor es |
|  |  |  |  |  |  |
| 25-44 | No | Yes | opioid medication usage | = | 21.469 + 7.715 Average self-report pain scor es |
|  |  |  |  |  |  |
| 25-44 | Yes | No | opioid medication usage | = | 11.232 + 7.715 Average self-report pain scor es |
|  |  |  |  |  |  |
| 25-44 | Yes | Yes | opioid medication usage | = | 25.45 + 7.715 Average self-report pain scor es |
|  |  |  |  |  |  |
| 45-64 | No | No | opioid medication usage | = | 7.892 + 7.715 Average self-report pain scor es |
|  |  |  |  |  |  |
| 45-64 | No | Yes | opioid medication usage | = | 22.108 + 7.715 Average self-report pain scor es |
|  |  |  |  |  |  |
| 45-64 | Yes | No | opioid medication usage | = | 11.871 + 7.715 Average self-report pain scor es |
|  |  |  |  |  |  |
| 45-64 | Yes | Yes | opioid medication usage | = | 26.09 + 7.715 Average self-report pain scor es |
|  |  |  |  |  |  |
| 65+ | No | No | opioid medication usage | = | 6.871 + 7.715 Average self-report pain scor es |
|  |  |  |  |  |  |
| 65+ | No | Yes | opioid medication usage | = | 21.086 + 7.715 Average self-report pain scor es |
|  |  |  |  |  |  |
| 65+ | Yes | No | opioid medication usage | = | 10.850 + 7.715 Average self-report pain scor es |
|  |  |  |  |  |  |
| 65+ | Yes | Yes | opioid medication usage | = | 25.07 + 7.715 Average self-report pain scor es |

**Coefficients**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Term** | **Coef** | **SE Coef** | **T-Value** | **P-Value** | **VIF** |
| Constant | 6.573 | 0.463 | 14.21 | 0.000 |  |
| Average self-report pain scores | 7.715 | 0.139 | 55.67 | 0.000 | 5.35 |
| Age Group |  |  |  |  |  |
| 18-24 | 0.621 | 0.828 | 0.75 | 0.453 | 1.13 |
| 25-44 | 0.680 | 0.477 | 1.42 | 0.154 | 1.44 |
| 45-64 | 1.319 | 0.483 | 2.73 | 0.006 | 1.43 |
|  |  |  |  |  |  |
| 65+ | 0.297 | 0.509 | 0.58 | 0.559 | 1.39 |
| Family history |  |  |  |  |  |
| Yes | 3.979 | 0.720 | 5.53 | 0.000 | 4.40 |
| Opiod OD Yes/No |  |  |  |  |  |
| Yes | 14.216 | 0.658 | 21.61 | 0.000 | 1.48 |

**Model Summary**

|  |  |  |  |
| --- | --- | --- | --- |
| **S** | **R-sq** | **R-sq(adj)** | **R-sq(pred)** |
| 12.3223 | 82.21% | 82.18% | 82.15% |

**R-square 82.21 and predicted R-square 82.15% illustrates there is better predictability in the dataset.**

**Analysis of Variance**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Source** | **DF** | **Adj SS** | **Adj MS** | **F-Value** | **P-Value** |
| Regression | 7 | 3617563 | 516795 | 3403.54 | 0.000 |
| Average self-report pain scores | 1 | 470653 | 470653 | 3099.66 | 0.000 |
| Age Group | 4 | 1226 | 306 | 2.02 | 0.089 |
| Family history | 1 | 4642 | 4642 | 30.57 | 0.000 |
| Opiod OD Yes/No | 1 | 70917 | 70917 | 467.05 | 0.000 |
| Error | 5157 | 783040 | 152 |  |  |
| Lack-of-Fit | 52 | 164441 | 3162 | 26.10 | 0.000 |
| Pure Error | 5105 | 618599 | 121 |  |  |
| Total | 5164 | 4400603 |  |  |  |
|  |  |  |  |  |  |

**There are significant p-values for average self-reported pain scores, family history and opioid overdose. Overall there doesn’t appear to be significance between Age groups in total, however there is between the ages of 45-64. This significance illustrates correlation between the response and predictor variables. Lack of fit from large residuals in the dataset indicates multiple observations with identical predictor variable values (x-values). Pure error indicates these replications are lack of random variation therefore the lack of differences in predictor and response variables. The Lack-of-Fit P-value illustrates that the model doesn’t fit the data accurately and need to clean the data to avoid duplications.**

**Fits and Diagnostics for Unusual Observations**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Obs** | **opioid medication usage** | **Fit** | **Resid** | **Std Resid** |  |  |
| 5 | 21.000 | 56.842 | -35.842 | -2.91 | R |  |
| 9 | 33.000 | 65.236 | -32.236 | -2.62 | R |  |
| 13 | 20.000 | 72.951 | -52.951 | -4.30 | R |  |
| 14 | 22.000 | 50.446 | -28.446 | -2.31 | R |  |
| 18 | 5.000 | 80.284 | -75.284 | -6.12 | R |  |
| 22 | 27.000 | 56.842 | -29.842 | -2.42 | R |  |
| 24 | 23.000 | 49.127 | -26.127 | -2.12 | R |  |
| 27 | 4.000 | 80.666 | -76.666 | -6.23 | R |  |
| 34 | 32.000 | 73.591 | -41.591 | -3.38 | R |  |
| 36 | 30.000 | 64.854 | -34.854 | -2.83 | R |  |
| 38 | 9.000 | 64.556 | -55.556 | -4.51 | R |  |
| 39 | 22.000 | 56.842 | -34.842 | -2.83 | R |  |
| 41 | 8.000 | 56.842 | -48.842 | -3.97 | R |  |
| 44 | 7.000 | 38.113 | -31.113 | -2.53 | R |  |
| 46 | 2.000 | 38.054 | -36.054 | -2.93 | R |  |
| 52 | 18.000 | 49.424 | -31.424 | -2.55 | R |  |
| 58 | 33.000 | 64.556 | -31.556 | -2.56 | R |  |
| 63 | 7.000 | 65.178 | -58.178 | -4.73 | R |  |
| 68 | 34.000 | 72.569 | -38.569 | -3.13 | R |  |
| 69 | 9.000 | 80.284 | -71.284 | -5.79 | R |  |
| 70 | 25.000 | 72.569 | -47.569 | -3.86 | R |  |
| 71 | 9.000 | 65.236 | -56.236 | -4.57 | R |  |
| 76 | 7.000 | 49.127 | -42.127 | -3.42 | R |  |
| 81 | 15.000 | 49.807 | -34.807 | -2.83 | R |  |
| 82 | 10.000 | 49.127 | -39.127 | -3.18 | R |  |
| 87 | 12.000 | 37.730 | -25.730 | -2.09 | R |  |
| 89 | 2.000 | 37.433 | -35.433 | -2.88 | R |  |
| 91 | 18.000 | 56.842 | -38.842 | -3.15 | R |  |
| 96 | 13.000 | 49.807 | -36.807 | -2.99 | R |  |
| 98 | 39.000 | 80.666 | -41.666 | -3.38 | R |  |
| 99 | 34.000 | 64.556 | -30.556 | -2.48 | R |  |
| 107 | 11.000 | 56.842 | -45.842 | -3.72 | R |  |
| 110 | 3.000 | 49.127 | -46.127 | -3.75 | R |  |
| 111 | 15.000 | 73.591 | -58.591 | -4.76 | R |  |
| 113 | 56.000 | 80.666 | -24.666 | -2.00 | R |  |
| 115 | 3.000 | 30.398 | -27.398 | -2.22 | R |  |
| 118 | 46.000 | 72.271 | -26.271 | -2.13 | R |  |
| 119 | 43.000 | 80.284 | -37.284 | -3.03 | R |  |
| 125 | 11.000 | 56.842 | -45.842 | -3.72 | R |  |
| 127 | 25.000 | 73.591 | -48.591 | -3.95 | R |  |
| 128 | 22.000 | 49.807 | -27.807 | -2.26 | R |  |
| 129 | 55.000 | 80.666 | -25.666 | -2.08 | R |  |
| 132 | 25.000 | 64.556 | -39.556 | -3.21 | R |  |
| 133 | 19.000 | 56.842 | -37.842 | -3.07 | R |  |
| 134 | 14.000 | 64.556 | -50.556 | -4.10 | R |  |
| 139 | 11.000 | 72.271 | -61.271 | -4.98 | R |  |
| 142 | 0.000 | 37.433 | -37.433 | -3.04 | R |  |
| 143 | 8.000 | 65.876 | -57.876 | -4.70 | R |  |
| 147 | 6.000 | 80.666 | -74.666 | -6.06 | R |  |
| 149 | 26.000 | 72.271 | -46.271 | -3.76 | R |  |
| 150 | 22.000 | 56.842 | -34.842 | -2.83 | R |  |
| 152 | 4.000 | 80.284 | -76.284 | -6.20 | R |  |
| 159 | 5.000 | 31.037 | -26.037 | -2.11 | R |  |
| 160 | 2.000 | 57.521 | -55.521 | -4.51 | R |  |
| 161 | 13.000 | 49.807 | -36.807 | -2.99 | R |  |
| 164 | 30.000 | 56.842 | -26.842 | -2.18 | R |  |
| 165 | 24.000 | 64.556 | -40.556 | -3.29 | R |  |
| 167 | 4.000 | 80.284 | -76.284 | -6.20 | R |  |
| 168 | 34.000 | 72.569 | -38.569 | -3.13 | R |  |
| 170 | 14.000 | 65.236 | -51.236 | -4.16 | R |  |
| 173 | 4.000 | 64.556 | -60.556 | -4.92 | R |  |
| 174 | 23.000 | 49.127 | -26.127 | -2.12 | R |  |
| 176 | 3.000 | 65.236 | -62.236 | -5.05 | R |  |
| 179 | 30.000 | 57.521 | -27.521 | -2.23 | R |  |
| 181 | 31.000 | 64.556 | -33.556 | -2.72 | R |  |
| 188 | 51.000 | 79.986 | -28.986 | -2.35 | R |  |
| 190 | 25.000 | 64.556 | -39.556 | -3.21 | R |  |
| 191 | 43.000 | 73.591 | -30.591 | -2.48 | R |  |
| 194 | 18.000 | 65.178 | -47.178 | -3.84 | R |  |
| 198 | 6.000 | 49.127 | -43.127 | -3.50 | R |  |
| 199 | 17.000 | 73.591 | -56.591 | -4.60 | R |  |
| 205 | 23.000 | 79.986 | -56.986 | -4.63 | R |  |
| 210 | 26.000 | 80.608 | -54.608 | -4.44 | R | X |
| 211 | 26.000 | 72.951 | -46.951 | -3.81 | R |  |
| 212 | 19.000 | 49.127 | -30.127 | -2.45 | R |  |
| 215 | 9.000 | 38.752 | -29.752 | -2.42 | R |  |
| 220 | 14.000 | 49.127 | -35.127 | -2.85 | R |  |
| 221 | 2.000 | 56.842 | -54.842 | -4.45 | R |  |
| 222 | 30.000 | 79.986 | -49.986 | -4.06 | R |  |
| 227 | 26.000 | 56.842 | -30.842 | -2.50 | R |  |
| 229 | 39.000 | 73.591 | -34.591 | -2.81 | R |  |
| 230 | 7.000 | 80.284 | -73.284 | -5.95 | R |  |
| 234 | 1.000 | 49.127 | -48.127 | -3.91 | R |  |
| 235 | 5.000 | 37.433 | -32.433 | -2.63 | R |  |
| 241 | 3.000 | 57.521 | -54.521 | -4.43 | R |  |
| 248 | 13.000 | 73.591 | -60.591 | -4.92 | R |  |
| 250 | 8.000 | 37.730 | -29.730 | -2.41 | R |  |
| 256 | 6.000 | 49.127 | -43.127 | -3.50 | R |  |
| 260 | 12.000 | 49.807 | -37.807 | -3.07 | R |  |
| 261 | 35.000 | 65.236 | -30.236 | -2.46 | R |  |
| 264 | 91.000 | 94.823 | -3.823 | -0.31 |  | X |
| 265 | 19.000 | 57.521 | -38.521 | -3.13 | R |  |
| 268 | 15.000 | 72.271 | -57.271 | -4.65 | R |  |
| 272 | 32.000 | 65.876 | -33.876 | -2.75 | R |  |
| 273 | 14.000 | 80.284 | -66.284 | -5.39 | R |  |
| 275 | 11.000 | 79.986 | -68.986 | -5.60 | R |  |
| 281 | 12.000 | 57.521 | -45.521 | -3.70 | R |  |
| 284 | 7.000 | 57.521 | -50.521 | -4.10 | R |  |
| 289 | 46.000 | 72.271 | -26.271 | -2.13 | R |  |
| 292 | 10.000 | 57.139 | -47.139 | -3.83 | R |  |
| 294 | 32.000 | 57.139 | -25.139 | -2.04 | R |  |
| 295 | 0.000 | 80.666 | -80.666 | -6.55 | R |  |
| 300 | 21.000 | 73.591 | -52.591 | -4.27 | R |  |
| 302 | 41.000 | 72.951 | -31.951 | -2.59 | R |  |
| 304 | 51.000 | 80.666 | -29.666 | -2.41 | R |  |
| 305 | 48.000 | 80.666 | -32.666 | -2.65 | R |  |
| 307 | 28.000 | 80.666 | -52.666 | -4.28 | R |  |
| 309 | 56.000 | 81.305 | -25.305 | -2.06 | R |  |
| 310 | 45.000 | 72.271 | -27.271 | -2.21 | R |  |
| 315 | 11.000 | 57.139 | -46.139 | -3.75 | R |  |
| 322 | 1.000 | 31.037 | -30.037 | -2.44 | R |  |
| 328 | 22.000 | 72.893 | -50.893 | -4.14 | R |  |
| 329 | 1.000 | 49.807 | -48.807 | -3.96 | R |  |
| 330 | 37.000 | 81.305 | -44.305 | -3.60 | R |  |
| 338 | 37.000 | 72.569 | -35.569 | -2.89 | R |  |
| 354 | 10.000 | 72.271 | -62.271 | -5.06 | R |  |
| 357 | 8.000 | 37.730 | -29.730 | -2.41 | R |  |
| 359 | 12.000 | 64.854 | -52.854 | -4.29 | R |  |
| 360 | 8.000 | 80.666 | -72.666 | -5.90 | R |  |
| 362 | 17.000 | 56.842 | -39.842 | -3.23 | R |  |
| 364 | 12.000 | 72.271 | -60.271 | -4.89 | R |  |
| 369 | 22.000 | 49.807 | -27.807 | -2.26 | R |  |
| 373 | 43.000 | 81.305 | -38.305 | -3.11 | R |  |
| 376 | 13.000 | 49.127 | -36.127 | -2.93 | R |  |
| 378 | 11.000 | 65.876 | -54.876 | -4.46 | R |  |
| 379 | 33.000 | 72.569 | -39.569 | -3.21 | R |  |
| 393 | 72.000 | 80.608 | -8.608 | -0.70 |  | X |
| 395 | 26.000 | 81.305 | -55.305 | -4.49 | R |  |
| 396 | 15.000 | 73.591 | -58.591 | -4.76 | R |  |
| 401 | 20.000 | 80.284 | -60.284 | -4.90 | R |  |
| 402 | 18.000 | 49.424 | -31.424 | -2.55 | R |  |
| 405 | 18.000 | 49.127 | -31.127 | -2.53 | R |  |
| 412 | 30.000 | 80.666 | -50.666 | -4.12 | R |  |
| 413 | 41.000 | 72.951 | -31.951 | -2.59 | R |  |
| 414 | 12.000 | 65.236 | -53.236 | -4.32 | R |  |
| 415 | 10.000 | 49.748 | -39.748 | -3.23 | R |  |
| 416 | 1.000 | 57.521 | -56.521 | -4.59 | R |  |
| 418 | 3.000 | 38.752 | -35.752 | -2.90 | R |  |
| 423 | 21.000 | 64.854 | -43.854 | -3.56 | R |  |
| 428 | 47.000 | 72.271 | -25.271 | -2.05 | R |  |
| 429 | 30.000 | 56.842 | -26.842 | -2.18 | R |  |
| 430 | 28.000 | 65.876 | -37.876 | -3.08 | R |  |
| 434 | 38.000 | 72.951 | -34.951 | -2.84 | R |  |
| 442 | 24.000 | 50.446 | -26.446 | -2.15 | R |  |
| 444 | 43.000 | 80.284 | -37.284 | -3.03 | R |  |
| 445 | 1.000 | 30.015 | -29.015 | -2.36 | R |  |
| 446 | 31.000 | 80.666 | -49.666 | -4.03 | R |  |
| 449 | 17.000 | 64.556 | -47.556 | -3.86 | R |  |
| 450 | 15.000 | 49.127 | -34.127 | -2.77 | R |  |
| 453 | 20.000 | 49.807 | -29.807 | -2.42 | R |  |
| 454 | 10.000 | 80.666 | -70.666 | -5.74 | R |  |
| 455 | 17.000 | 49.807 | -32.807 | -2.66 | R |  |
| 457 | 14.000 | 49.748 | -35.748 | -2.91 | R |  |
| 458 | 13.000 | 80.666 | -67.666 | -5.50 | R |  |
| 459 | 27.000 | 73.591 | -46.591 | -3.78 | R |  |
| 465 | 22.000 | 80.284 | -58.284 | -4.74 | R |  |
| 467 | 53.000 | 81.305 | -28.305 | -2.30 | R |  |
| 471 | 5.000 | 29.718 | -24.718 | -2.01 | R |  |
| 472 | 1.000 | 56.842 | -55.842 | -4.53 | R |  |
| 478 | 14.000 | 72.951 | -58.951 | -4.79 | R |  |
| 480 | 45.000 | 72.893 | -27.893 | -2.27 | R |  |
| 483 | 1.000 | 38.752 | -37.752 | -3.07 | R |  |
| 498 | 0.000 | 81.305 | -81.305 | -6.60 | R |  |
| 499 | 6.000 | 57.521 | -51.521 | -4.18 | R |  |
| 500 | 38.000 | 65.236 | -27.236 | -2.21 | R |  |
| 503 | 9.000 | 57.463 | -48.463 | -3.94 | R |  |
| 504 | 15.000 | 57.521 | -42.521 | -3.45 | R |  |
| 505 | 14.000 | 65.876 | -51.876 | -4.21 | R |  |
| 506 | 43.000 | 81.305 | -38.305 | -3.11 | R |  |
| 508 | 24.000 | 64.556 | -40.556 | -3.29 | R |  |
| 512 | 21.000 | 72.569 | -51.569 | -4.19 | R |  |
| 517 | 19.000 | 56.842 | -37.842 | -3.07 | R |  |
| 526 | 10.000 | 50.446 | -40.446 | -3.28 | R |  |
| 529 | 0.000 | 37.433 | -37.433 | -3.04 | R |  |
| 537 | 19.000 | 65.236 | -46.236 | -3.75 | R |  |
| 539 | 24.000 | 49.127 | -25.127 | -2.04 | R |  |
| 540 | 10.000 | 64.556 | -54.556 | -4.43 | R |  |
| 541 | 14.000 | 79.986 | -65.986 | -5.36 | R |  |
| 542 | 37.000 | 81.305 | -44.305 | -3.60 | R |  |
| 544 | 0.000 | 38.113 | -38.113 | -3.10 | R |  |
| 546 | 9.000 | 57.521 | -48.521 | -3.94 | R |  |
| 548 | 13.000 | 49.748 | -36.748 | -2.99 | R |  |
| 550 | 0.000 | 38.752 | -38.752 | -3.15 | R |  |
| 553 | 5.000 | 72.271 | -67.271 | -5.46 | R |  |
| 556 | 16.000 | 57.139 | -41.139 | -3.34 | R |  |
| 559 | 17.000 | 64.854 | -47.854 | -3.89 | R |  |
| 560 | 14.000 | 73.591 | -59.591 | -4.84 | R |  |
| 562 | 29.000 | 65.236 | -36.236 | -2.94 | R |  |
| 563 | 5.000 | 72.271 | -67.271 | -5.46 | R |  |
| 564 | 6.000 | 37.433 | -31.433 | -2.55 | R |  |
| 566 | 8.000 | 37.433 | -29.433 | -2.39 | R |  |
| 570 | 11.000 | 80.666 | -69.666 | -5.66 | R |  |
| 571 | 2.000 | 30.398 | -28.398 | -2.31 | R |  |
| 574 | 4.000 | 80.666 | -76.666 | -6.23 | R |  |
| 577 | 18.000 | 49.127 | -31.127 | -2.53 | R |  |
| 579 | 22.000 | 58.161 | -36.161 | -2.94 | R |  |
| 588 | 16.000 | 56.842 | -40.842 | -3.32 | R |  |
| 594 | 22.000 | 72.951 | -50.951 | -4.14 | R |  |
| 598 | 6.000 | 65.876 | -59.876 | -4.86 | R |  |
| 599 | 18.000 | 73.591 | -55.591 | -4.51 | R |  |
| 607 | 34.000 | 64.854 | -30.854 | -2.51 | R |  |
| 608 | 5.000 | 58.161 | -53.161 | -4.32 | R |  |
| 610 | 16.000 | 49.807 | -33.807 | -2.75 | R |  |
| 611 | 0.000 | 29.718 | -29.718 | -2.41 | R |  |
| 620 | 36.000 | 72.951 | -36.951 | -3.00 | R |  |
| 621 | 19.000 | 72.893 | -53.893 | -4.38 | R |  |
| 624 | 6.000 | 31.037 | -25.037 | -2.03 | R |  |
| 625 | 37.000 | 79.986 | -42.986 | -3.49 | R |  |
| 626 | 14.000 | 56.842 | -42.842 | -3.48 | R |  |
| 627 | 16.000 | 65.876 | -49.876 | -4.05 | R |  |
| 631 | 35.000 | 80.284 | -45.284 | -3.68 | R |  |
| 632 | 23.000 | 72.569 | -49.569 | -4.03 | R |  |
| 633 | 2.000 | 38.752 | -36.752 | -2.98 | R |  |
| 638 | 21.000 | 79.986 | -58.986 | -4.79 | R |  |
| 645 | 7.000 | 65.236 | -58.236 | -4.73 | R |  |
| 647 | 1.000 | 49.807 | -48.807 | -3.96 | R |  |
| 649 | 7.000 | 38.752 | -31.752 | -2.58 | R |  |
| 653 | 28.000 | 57.139 | -29.139 | -2.37 | R |  |
| 654 | 10.000 | 49.424 | -39.424 | -3.20 | R |  |
| 656 | 23.000 | 80.284 | -57.284 | -4.65 | R |  |
| 658 | 20.000 | 57.139 | -37.139 | -3.02 | R |  |
| 661 | 40.000 | 79.986 | -39.986 | -3.25 | R |  |
| 662 | 5.000 | 29.718 | -24.718 | -2.01 | R |  |
| 664 | 19.000 | 65.876 | -46.876 | -3.81 | R |  |
| 666 | 40.000 | 65.236 | -25.236 | -2.05 | R |  |
| 670 | 33.000 | 80.608 | -47.608 | -3.87 | R | X |
| 676 | 37.000 | 65.876 | -28.876 | -2.34 | R |  |
| 677 | 15.000 | 64.854 | -49.854 | -4.05 | R |  |
| 680 | 3.000 | 30.015 | -27.015 | -2.19 | R |  |
| 682 | 53.000 | 81.305 | -28.305 | -2.30 | R |  |
| 683 | 0.000 | 72.569 | -72.569 | -5.89 | R |  |
| 684 | 2.000 | 80.666 | -78.666 | -6.39 | R |  |
| 690 | 36.000 | 65.876 | -29.876 | -2.43 | R |  |
| 695 | 25.000 | 57.463 | -32.463 | -2.64 | R |  |
| 700 | 8.000 | 37.433 | -29.433 | -2.39 | R |  |
| 702 | 12.000 | 37.730 | -25.730 | -2.09 | R |  |
| 705 | 25.000 | 64.854 | -39.854 | -3.24 | R |  |
| 706 | 16.000 | 49.424 | -33.424 | -2.71 | R |  |
| 710 | 27.000 | 64.556 | -37.556 | -3.05 | R |  |
| 716 | 19.000 | 57.521 | -38.521 | -3.13 | R |  |
| 717 | 44.000 | 81.305 | -37.305 | -3.03 | R |  |
| 718 | 7.000 | 38.113 | -31.113 | -2.53 | R |  |
| 720 | 20.000 | 49.807 | -29.807 | -2.42 | R |  |
| 725 | 5.000 | 73.591 | -68.591 | -5.57 | R |  |
| 733 | 22.000 | 56.842 | -34.842 | -2.83 | R |  |
| 736 | 9.000 | 49.127 | -40.127 | -3.26 | R |  |
| 740 | 36.000 | 80.666 | -44.666 | -3.63 | R |  |
| 745 | 34.000 | 65.876 | -31.876 | -2.59 | R |  |
| 747 | 50.000 | 79.986 | -29.986 | -2.44 | R |  |
| 749 | 5.000 | 38.752 | -33.752 | -2.74 | R |  |
| 753 | 32.000 | 64.854 | -32.854 | -2.67 | R |  |
| 757 | 15.000 | 57.521 | -42.521 | -3.45 | R |  |
| 758 | 37.000 | 79.986 | -42.986 | -3.49 | R |  |
| 760 | 2.000 | 72.271 | -70.271 | -5.71 | R |  |
| 764 | 2.000 | 38.113 | -36.113 | -2.93 | R |  |
| 770 | 35.000 | 73.591 | -38.591 | -3.13 | R |  |
| 771 | 20.000 | 50.446 | -30.446 | -2.47 | R |  |
| 779 | 12.000 | 65.876 | -53.876 | -4.37 | R |  |
| 780 | 11.000 | 57.139 | -46.139 | -3.75 | R |  |
| 783 | 0.000 | 79.986 | -79.986 | -6.50 | R |  |
| 789 | 21.000 | 65.876 | -44.876 | -3.64 | R |  |
| 792 | 4.000 | 30.398 | -26.398 | -2.14 | R |  |
| 799 | 3.000 | 49.424 | -46.424 | -3.77 | R |  |
| 800 | 29.000 | 64.854 | -35.854 | -2.91 | R |  |
| 802 | 8.000 | 57.139 | -49.139 | -3.99 | R |  |
| 803 | 19.000 | 72.951 | -53.951 | -4.38 | R |  |
| 813 | 2.000 | 49.807 | -47.807 | -3.88 | R |  |
| 814 | 5.000 | 30.339 | -25.339 | -2.06 | R |  |
| 1128 | 88.000 | 87.108 | 0.892 | 0.07 |  | X |
| 1394 | 97.000 | 94.823 | 2.177 | 0.18 |  | X |
| 1959 | 89.000 | 87.108 | 1.892 | 0.15 |  | X |
| 2075 | 97.000 | 94.823 | 2.177 | 0.18 |  | X |
| 2123 | 87.000 | 87.108 | -0.108 | -0.01 |  | X |
| 2197 | 90.000 | 94.823 | -4.823 | -0.39 |  | X |
| 2236 | 86.000 | 87.108 | -1.108 | -0.09 |  | X |
| 2314 | 99.000 | 94.823 | 4.177 | 0.34 |  | X |
| 2352 | 91.000 | 94.823 | -3.823 | -0.31 |  | X |
| 2392 | 87.000 | 87.108 | -0.108 | -0.01 |  | X |
| 2404 | 97.000 | 94.823 | 2.177 | 0.18 |  | X |
| 2442 | 97.000 | 94.823 | 2.177 | 0.18 |  | X |
| 2695 | 92.000 | 94.823 | -2.823 | -0.23 |  | X |
| 2735 | 90.000 | 94.823 | -4.823 | -0.39 |  | X |
| 2939 | 88.000 | 87.108 | 0.892 | 0.07 |  | X |
| 3327 | 96.000 | 94.823 | 1.177 | 0.10 |  | X |
| 3607 | 97.000 | 94.823 | 2.177 | 0.18 |  | X |
| 3814 | 90.000 | 94.823 | -4.823 | -0.39 |  | X |
| 3944 | 90.000 | 94.823 | -4.823 | -0.39 |  | X |
| 4008 | 93.000 | 94.823 | -1.823 | -0.15 |  | X |
| 4313 | 99.000 | 94.823 | 4.177 | 0.34 |  | X |
| 4381 | 96.000 | 94.823 | 1.177 | 0.10 |  | X |
| 4450 | 91.000 | 94.823 | -3.823 | -0.31 |  | X |
| 4548 | 96.000 | 94.823 | 1.177 | 0.10 |  | X |
| 4622 | 97.000 | 94.823 | 2.177 | 0.18 |  | X |
| 4645 | 88.000 | 87.108 | 0.892 | 0.07 |  | X |
| 4687 | 94.000 | 94.823 | -0.823 | -0.07 |  | X |
| 4710 | 96.000 | 94.823 | 1.177 | 0.10 |  | X |
| 4825 | 91.000 | 94.823 | -3.823 | -0.31 |  | X |
| 4945 | 95.000 | 94.823 | 0.177 | 0.01 |  | X |
| 4970 | 96.000 | 94.823 | 1.177 | 0.10 |  | X |

R  Large residual  
X  Unusual X

Chart

Description automatically generated

**The X in the Fits and Diagnostics for Unusual Observations shows unusual data that can point to data entry error with duplicate data entries with measurement errors. The data from the datasheet has multiple duplicates in patient identification entries. There are also entries of high school graduates with ages that do not make sense for that designation. This points to the importance in data collection to gain more reliable data.**

**Residuals**

**Normal Probability Plot: The error terms are not normally distributed.**

**Versus Fit: Residuals are not evenly distributed suggesting that there are outliers.**

**Histogram: The residuals are negatively skewed.**

**Versus Order: Negative correlation of residuals.**

This points to data that is not a random distribution which could be the result of duplicative data.