**INDICATOR 5**

| Treatment → | A | B | C | D | E | F | G | H |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Input Data → | 343.023 693.001 272.611 176.647 703.082 541.503 117.987 346.342 941.47 759.539 628.475 596.257 801.963 693.265 883.62 506.451 1511.28 501.767 1199.35 676.062 518.106 1692.85 872.584 1096.96 2501.6 1100.85 1712.47 664.088 2050.45 2713.83 480.751 1774.31 | 347.333 614.86 542.609 177.553 566.74 653.852 407.103 661.375 983.627 528.535 593.266 777.159 822.708 899.494 1043.8 410.542 1657.21 979.4 1210.48 191.76 1073.27 1428.02 584.616 800.626 2261.73 1049.73 1511.69 990.291 2369.8 2288.95 1331.69 2794.23 | 762.245 656.757 339.282 271.488 444.617 429.516 321.254 317.405 866.63 792.569 483.741 496.955 908.559 487.625 696.087 310.097 1387.2 555.428 813.477 806.895 1425.7 1775.73 690.812 560.808 1607.92 1598.46 790.962 1175.94 1361.22 1480.75 2556.75 2070.56 | 359.539 636.658 397.847 309.091 443.636 695.708 449.205 398.393 893.741 536.733 917.146 638.421 592.551 849.904 716.26 464.999 1857.71 431.727 1240.86 801.82 727.382 1561.0 1063.5 1450.58 820.346 1234.55 1246.74 712.512 4232.36 1846.22 1519.67 2377.68 | 342.546 475.758 425.022 577.17 529.918 825.204 679.224 567.48 890.0 512.306 906.104 826.71 910.74 1174.88 1296.06 655.147 997.647 788.807 1152.19 997.032 1249.52 2202.55 643.97 1106.48 2681.66 1867.39 1488.72 1506.36 2337.5 2530.94 1746.4 1988.31 | 859.084 490.499 268.337 290.043 697.775 749.947 794.346 362.592 1006.4 529.371 865.691 521.177 935.513 1748.76 1056.41 722.781 1948.71 912.739 1310.76 879.204 1670.0 2359.57 1047.06 1561.27 2025.64 2225.01 1210.83 1541.84 1930.84 2758.52 2631.28 2745.68 | 268.017 558.069 634.634 419.297 635.525 956.45 725.547 469.307 1032.22 568.001 799.033 1023.3 1194.76 1348.77 1190.55 424.986 2236.54 809.027 1436.38 720.936 1145.32 1511.18 1182.0 1057.88 3163.16 1690.49 1392.11 1026.02 1850.21 2437.06 1515.64 3166.73 | 381.849 786.985 218.048 223.946 522.311 807.055 225.887 813.173 1466.62 1034.66 1307.7 696.785 733.834 1468.1 1039.35 849.556 1861.23 1362.31 1510.58 1300.25 1630.42 1605.5 710.651 962.21 2748.67 1651.64 932.344 237.306 3065.71 3514.66 2775.66 2541.67 |

**Descriptive statistics of the k=8 independent treatments:**

| Treatment → | A | B | C | D | E | F | G | H | Pooled Total |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| observations N | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 256 |
| sum ∑xi | 30,072.5440 | 32,554.0490 | 29,243.4390 | 32,424.4890 | 36,879.7450 | 40,657.6790 | 38,589.1490 | 40,986.6700 | 281,407.7640 |
| mean ¯x | 939.7670 | 1,017.3140 | 913.8575 | 1,013.2653 | 1,152.4920 | 1,270.5525 | 1,205.9109 | 1,280.8334 | 1,099.2491 |
| sum of squares ∑x2i | 41,321,758.2839 | 46,424,454.9212 | 36,833,300.6290 | 51,532,462.6690 | 55,507,775.9793 | 68,541,654.2362 | 62,838,690.7859 | 75,495,989.2210 | 438,496,086.7254 |
| sample variance s2 | 421,308.8331 | 429,250.4548 | 326,095.6609 | 602,511.4098 | 419,489.1533 | 544,643.2196 | 525,923.0692 | 741,899.7353 | 506,505.3395 |
| sample std. dev. s | 649.0831 | 655.1721 | 571.0479 | 776.2161 | 647.6798 | 737.9995 | 725.2055 | 861.3360 | 711.6919 |
| std. dev. of mean SE¯x | 114.7428 | 115.8192 | 100.9480 | 137.2169 | 114.4947 | 130.4611 | 128.1994 | 152.2641 | 44.4807 |

**One-way ANOVA of your k=8 independent treatments:**

| source | sum of squares SS | degrees of freedom νν | mean square MS | F statistic | p-value |
| --- | --- | --- | --- | --- | --- |
| treatment | 4,814,093.9567 | 7 | 687,727.7081 | 1.3716 | 0.2178 |
| error | 124,344,767.6145 | 248 | 501,390.1920 |  |  |
| total | 129,158,861.5712 | 255 |  |  |  |

**Conclusion from Anova:**

The p-value corresponing to the F-statistic of one-way ANOVA is higher than 0.05, suggesting that the treatments are not significantly different for that level of significance. The Tukey HSD test, as well as other multiple comparison tests like Scheffe or Bonferroni, might not narrow down which of the pairs of treatments are significantly different. Even though your data does not suggest the presence of significatly different treatment pairs in one-way ANOVA, we proceed witht he multiple conparison tests. In some instances, a Bonferroni test of a small set of pairs might show significance, even though 1-way ANOVA suggests that there is too much noise and randomness in your data.