機械所設計組 R12522615 王邑安 HW\_ID:2

**Introduction to statistical control and optimization**

Homework 8



|  |  |  |  |  |  |  |  |
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| lot |  |  |  | lot |  |  |  |
| 1 | 21 | 328 | 15.61905 | 26 | 21 | 315 | 15 |
| 2 | 21 | 349 | 16.61905 | 27 | 23 | 397 | 17.26087 |
| 3 | 24 | 390 | 16.25 | 28 | 24 | 412 | 17.16667 |
| 4 | 25 | 419 | 16.76 | 29 | 19 | 298 | 15.68421 |
| 5 | 25 | 424 | 16.96 | 30 | 19 | 308 | 16.21053 |
| 6 | 20 | 340 | 17 | 31 | 24 | 404 | 16.83333 |
| 7 | 19 | 315 | 16.57895 | 32 | 20 | 299 | 14.95 |
| 8 | 25 | 413 | 16.52 | 33 | 25 | 412 | 16.48 |
| 9 | 25 | 421 | 16.84 | 34 | 22 | 319 | 14.5 |
| 10 | 25 | 397 | 15.88 | 35 | 24 | 375 | 15.625 |
| 11 | 22 | 365 | 16.59091 | 36 | 24 | 362 | 15.08333 |
| 12 | 20 | 306 | 15.3 | 37 | 24 | 373 | 15.54167 |
| 13 | 20 | 300 | 15 | 38 | 21 | 340 | 16.19048 |
| 14 | 20 | 329 | 16.45 | 39 | 20 | 322 | 16.1 |
| 15 | 24 | 367 | 15.29167 | 40 | 25 | 410 | 16.4 |
| 16 | 25 | 393 | 15.72 | 41 | 25 | 412 | 16.48 |
| 17 | 21 | 305 | 14.52381 | 42 | 21 | 341 | 16.2381 |
| 18 | 25 | 407 | 16.28 | 43 | 21 | 343 | 16.33333 |
| 19 | 24 | 368 | 15.33333 | 44 | 22 | 346 | 15.72727 |
| 20 | 25 | 402 | 16.08 | 45 | 25 | 399 | 15.96 |
| 21 | 19 | 297 | 15.63158 | 46 | 24 | 380 | 15.83333 |
| 22 | 25 | 392 | 15.68 | 47 | 22 | 339 | 15.40909 |
| 23 | 25 | 391 | 15.64 | 48 | 22 | 342 | 15.54545 |
| 24 | 25 | 392 | 15.68 | 49 | 21 | 320 | 15.2381 |
| 25 | 23 | 327 | 14.21739 | 50 | 25 | 388 | 15.52 |



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|  | CDF(LCL) | 1-CDF(UCL) |
| t.dist | 0.002117948 | 0.002117948 |

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|  | CDF((LCL-22)/sigma) | CDF((UCL-22)/sigma) |
| t.dist | 4.35616E-14 | 4.71936E-05 |



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| --- | --- | --- |
|  | CDF(LCL) | 1-CDF(UCL) |
| t.dist | 0.002117948 | 0.002117948 |

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| --- | --- | --- |
|  | CDF((LCL-0.2)/sigma) | CDF((UCL-0.2)/sigma) |
| t.dist | 7.83E-05 | 0.968540564 |



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|  | sample variance | standard errorσ | UCL | LCL |
| 348.4944 | 17.47582071 | 4.180409155 | 361.0357 | 335.9532 |

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| --- | --- | --- | --- | --- | --- | --- | --- |
| 1st Rule | 2st Rule | 3st Rule | 4st Rule | 5st Rule | 6st Rule | 7st Rule | 8st Rule |
| no | no | no | yes | no | no | no | yes |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | sample variance | standard errorσ | UCL | LCL |
| 3.111111 | 1.782828283 | 1.33522593 | 7.116789 | -0.89457 |

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| 1st Rule | 2st Rule | 3st Rule | 4st Rule | 5st Rule | 6st Rule | 7st Rule | 8st Rule |
| yes | yes | no | yes | no | no | no | yes |