**ISE420 hw#3 Name: Bolun Xu**

9.5(a)

(b)

9.9(a)

(b)

(c)

(d)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |  |

**3.** Simulate in Excel with A=68 B=140 for 15000 appointments:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Patient# | Appt Time | Actual start | Actuall Serv Time | Outsource(min) | Patient Delay (min) | Doc Delay (min) | Cost |
| 1 | 0 | 0 | 63.49934 | 0 | 0 | 0 | 0 |
| 2 | 68 | 68 | 46.91365 | 0 | 0 | 4.5006578 | 67.50987 |
| 3 | 136 | 136 | 41.23088 | 0 | 0 | 21.086347 | 316.2952 |
| 4 | 204 | 204 | 50.73073 | 0 | 0 | 26.769124 | 401.5369 |
| 5 | 272 | 272 | 33.27238 | 0 | 0 | 17.26927 | 259.0391 |
| 6 | 340 | 340 | 34.14481 | 0 | 0 | 34.727624 | 520.9144 |
| 7 | 408 | 408 | 30.67971 | 0 | 0 | 33.855188 | 507.8278 |
| 8 | 476 | 476 | 36.3669 | 0 | 0 | 37.320289 | 559.8043 |
| 9 | 544 | 544 | 70.02064 | 0 | 0 | 31.633103 | 474.4965 |
| 10 | 612 | 614.0206 | 39.00166 | 0 | 2.0206402 | 0 | 2.02064 |
| 11 | 680 | 680 | 125.3876 | 0 | 0 | 26.977702 | 404.6655 |
| 12 | 748 | 805.3876 | 138.3445 | 0 | 57.387579 | 0 | 57.38758 |
| 13 | 816 | 943.7321 | 40.01332 | 0 | 127.73207 | 0 | 127.7321 |
| 14 | 884 | 983.7454 | 77.93252 | 0 | 99.745385 | 0 | 99.74538 |
| 15 | 952 | 1061.678 | 79.2781 | 0 | 109.67791 | 0 | 109.6779 |
| 16 | 1020 | 1140.956 | 30.69856 | 0 | 120.95601 | 0 | 120.956 |
| 17 | 1088 | 1171.655 | 20.00381 | 0 | 83.654569 | 0 | 83.65457 |
| 18 | 1156 | 1191.658 | 71.22817 | 0 | 35.658383 | 0 | 35.65838 |
| 19 | 1224 | 1262.887 | 48.65217 | 0 | 38.886555 | 0 | 38.88655 |
| 20 | 1292 | 1311.539 | 66.69248 | 0 | 19.53873 | 0 | 19.53873 |

With many trials with different As and Bs, I found the min avg Cost is about 164 when A = 68 ±5, B = 140 ±10.

Here are some of results with A and B:

|  |  |  |
| --- | --- | --- |
| A= | B= | Avg  Cost= |
| 80 | 90 | 397 |
| 70 | 80 | 294 |
| 70 | 90 | 253 |
| 70 | 100 | 222 |
| 70 | 110 | 203 |
| 70 | 120 | 190 |
| 70 | 140 | 173 |
| 68 | 140 | 164 |