2025年北京理工大学数学建模竞赛第二轮赛题

A题：大气边界层高度

在研究空气污染扩散、天气预报、气候变化等问题时，大气边界层高度(ABLH)是一个非常重要的指标。ABLH与很多因素有关，比如温度、湿度、风速、气压等。位于嘉兴的北京理工大学长三角研究院曾利用激光雷达观测大气边界层高度，并同步获取了当地的温度、湿度、风速、气压等相关数据，参见附件1。

1、请建立数学模型，分析ABLH与温度、湿度、风速、气压等因素之间的量化关系，评估这些因素对ABLH的影响大小。

2、ABLH的变化会影响到当地空气质量，请结合当地空气质量数据，选择合理的数学模型分析ABLH与空气质量相关指标(PM₂.₅、PM₁₀、NO₂、AQI等)的量化关系，空气质量数据参见附件2。

3、请建立一个数学模型，根据天气预报数据来预测次日ABLH，并说明该模型的合理性。

这是截取的前几十条附件1的相关数据，总共的数据大概有8000条左右。

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| date | U向分量风/m/s | V向分量风/m/s | 2m气温/K | 表面气压/Pa | 地表温度/K | 潜热通量/ W/(m^2) | 感热通量/ W/(m^2) | 相对湿度/% | 大气边界层高度/m |
| 2024/1/1 0:00 | 0.646271 | -1.9507 | 276.843 | 103081.6 | 277.8889 | -29687 | -19724 | 76.3 | 157.1223 |
| 2024/1/1 1:00 | -0.50835 | -1.8045 | 277.7559 | 103066.8 | 280.4783 | -85150 | -186693 | 71.4 | 773.0969 |
| 2024/1/1 2:00 | -1.10878 | -0.95175 | 280.397 | 103063.8 | 282.7402 | -154937 | -352351 | 56.3 | 811.4998 |
| 2024/1/1 3:00 | -1.06062 | -0.41704 | 280.8547 | 102996.6 | 285.4924 | -210376 | -489956 | 53.5 | 871.5269 |
| 2024/1/1 4:00 | -0.8457 | -0.12671 | 281.2822 | 102880.5 | 286.8479 | -265034 | -599085 | 55 | 944.4844 |
| 2024/1/1 5:00 | -0.74457 | 0.026367 | 282.875 | 102771.9 | 287.2876 | -287593 | -616207 | 48.4 | 1020.487 |
| 2024/1/1 6:00 | -0.80489 | 0.323044 | 282.8562 | 102689.8 | 286.6397 | -250572 | -482641 | 49.3 | 1056.587 |
| 2024/1/1 7:00 | -0.94318 | 0.570663 | 282.7886 | 102661.3 | 284.8762 | -234709 | -372676 | 50 | 1053.19 |
| 2024/1/1 8:00 | -1.16972 | 0.360184 | 281.4866 | 102626.9 | 282.0283 | -147878 | -149475 | 55.2 | 937.7268 |
| 2024/1/1 9:00 | -1.42058 | 0.035751 | 280.0225 | 102644.3 | 277.4297 | -48476 | 1374 | 61.6 | 129.3962 |
| 2024/1/1 10:00 | -1.25191 | -0.10115 | 278.6643 | 102625.1 | 276.1277 | -11892 | 16442 | 67.3 | 47.45473 |
| 2024/1/1 11:00 | -1.49321 | -0.11215 | 277.7339 | 102626.8 | 275.0049 | -11580 | 19008 | 72.5 | 42.52454 |
| 2024/1/1 12:00 | -1.78343 | -0.10681 | 277.3357 | 102619.8 | 274.3543 | -10631 | 21968 | 74.5 | 43.55931 |
| 2024/1/1 13:00 | -1.97784 | -0.16339 | 277.1057 | 102641.8 | 273.6653 | -9227 | 19981 | 76 | 46.85541 |
| 2024/1/1 14:00 | -2.36705 | -0.1194 | 275.4919 | 102681.7 | 273.3191 | -7528 | 17699 | 83.1 | 51.8846 |
| 2024/1/1 15:00 | -2.58476 | 0.026657 | 274.8235 | 102625.3 | 273.0237 | -5535 | 20656 | 87.3 | 57.79652 |
| 2024/1/1 16:00 | -2.57712 | 0.15947 | 274.3948 | 102606.4 | 272.7014 | -2751 | 25501 | 90.4 | 54.98071 |
| 2024/1/1 17:00 | -2.55916 | 0.081558 | 273.7402 | 102577.5 | 272.4605 | 2129 | 34921 | 94.4 | 51.00125 |
| 2024/1/1 18:00 | -2.45047 | -0.06009 | 273.8804 | 102519.3 | 272.3997 | 7044 | 41357 | 95.4 | 52.18092 |
| 2024/1/1 19:00 | -2.50702 | 0.046463 | 273.8357 | 102480.8 | 272.1856 | 5031 | 23380 | 95.4 | 50.17859 |
| 2024/1/1 20:00 | -2.20511 | -0.02797 | 273.2192 | 102435.2 | 271.9448 | 3277 | 15324 | 97.9 | 40.71983 |
| 2024/1/1 21:00 | -2.12299 | -0.14291 | 273.155 | 102408.7 | 271.8889 | 3809 | 12785 | 97.1 | 37.00626 |
| 2024/1/1 22:00 | -1.52858 | -0.35912 | 273.3013 | 102391.2 | 271.7717 | 7706 | 20066 | 98.6 | 30.37018 |
| 2024/1/1 23:00 | -1.39552 | -0.42775 | 273.6008 | 102465.5 | 272.929 | 13070 | 30666 | 98.2 | 42.10327 |
| 2024/1/2 0:00 | -1.85365 | -0.31331 | 274.9697 | 102401.1 | 276.991 | -3181 | -2423 | 97.1 | 96.539 |
| 2024/1/2 1:00 | -1.65909 | 0.223236 | 276.0989 | 102400 | 279.8345 | -61158 | -146376 | 92.9 | 179.8861 |
| 2024/1/2 2:00 | -1.45271 | 0.77211 | 280.8833 | 102452.1 | 282.9351 | -136769 | -297852 | 73.7 | 277.3406 |
| 2024/1/2 3:00 | -2.07271 | 1.827622 | 281.8616 | 102374.8 | 284.9524 | -208352 | -463259 | 69.7 | 514.0335 |
| 2024/1/2 4:00 | -2.01152 | 1.915604 | 282.4182 | 102225.3 | 286.3782 | -253246 | -590704 | 68.3 | 594.4346 |
| 2024/1/2 5:00 | -1.20065 | 1.472046 | 284.1541 | 102099.9 | 288.0649 | -249173 | -533271 | 62.7 | 696.2661 |
| 2024/1/2 6:00 | -1.3979 | 0.46817 | 284.2647 | 102031.6 | 287.9063 | -229296 | -426749 | 62 | 712.0562 |
| 2024/1/2 7:00 | -1.90178 | -0.04938 | 284.3169 | 101967 | 285.8005 | -189925 | -296603 | 61.6 | 670.1091 |
| 2024/1/2 8:00 | -1.44661 | -0.78146 | 283.3457 | 102008 | 283.282 | -92984 | -61855 | 66.6 | 573.6909 |
| 2024/1/2 9:00 | -0.08203 | -0.67978 | 281.5791 | 102104.6 | 279.8562 | -25154 | 18091 | 77 | 136.3117 |
| 2024/1/2 10:00 | 0.898499 | -1.12714 | 281.7581 | 102204.6 | 279.6333 | -7851 | 33162 | 75.5 | 117.1488 |
| 2024/1/2 11:00 | 1.149384 | -1.83832 | 281.3403 | 102252.3 | 279.5967 | -9109 | 36135 | 75.2 | 152.5576 |
| 2024/1/2 12:00 | 0.649796 | -2.77901 | 281.4998 | 102235.9 | 279.6953 | -14995 | 36749 | 71.7 | 240.8869 |
| 2024/1/2 13:00 | -0.14677 | -2.98927 | 281.1548 | 102261.4 | 279.4546 | -39456 | 49358 | 75.3 | 343.7498 |
| 2024/1/2 14:00 | -0.02654 | -2.68324 | 280.1475 | 102308 | 278.8037 | -63736 | 50486 | 83.5 | 311.8452 |
| 2024/1/2 15:00 | 0.488113 | -2.34619 | 279.8396 | 102375.3 | 278.1856 | -60509 | 34051 | 85.2 | 258.1926 |
| 2024/1/2 16:00 | 0.701279 | -2.05339 | 279.626 | 102369.6 | 277.9846 | -51698 | 22020 | 85.7 | 261.2778 |
| 2024/1/2 17:00 | 1.143021 | -2.16867 | 278.9055 | 102348.9 | 277.6958 | -54009 | 15979 | 88.3 | 263.9844 |
| 2024/1/2 18:00 | 1.833969 | -2.81152 | 278.5735 | 102401.4 | 277.3965 | -61844 | 19376 | 90.4 | 394.6958 |
| 2024/1/2 19:00 | 2.280441 | -3.17371 | 278.3023 | 102428.1 | 277.1133 | -82836 | 10392 | 91.7 | 458.4744 |
| 2024/1/2 20:00 | 2.668503 | -2.90743 | 277.9048 | 102469.9 | 276.8672 | -84088 | -7352 | 90.5 | 495.626 |
| 2024/1/2 21:00 | 2.959045 | -2.52103 | 277.7888 | 102461 | 276.8196 | -83964 | -13173 | 90 | 581.801 |
| 2024/1/2 22:00 | 3.297363 | -2.29338 | 278.0313 | 102481.4 | 277.3484 | -67466 | -9309 | 87.9 | 648.6626 |
| 2024/1/2 23:00 | 3.518234 | -2.44757 | 278.1182 | 102537.7 | 277.2427 | -74327 | -12668 | 87.6 | 660.1604 |
| 2024/1/3 0:00 | 3.963684 | -2.92465 | 278.1094 | 102618.8 | 277.4578 | -107257 | -29457 | 84 | 693.6655 |
| 2024/1/3 1:00 | 4.289124 | -3.45959 | 278.0798 | 102657.3 | 277.9651 | -167627 | -86718 | 81.6 | 704.0566 |
| 2024/1/3 2:00 | 4.232483 | -3.48398 | 279.2383 | 102743 | 278.9932 | -195894 | -231946 | 73.5 | 709.2727 |
| 2024/1/3 3:00 | 3.982666 | -3.46362 | 279.8193 | 102757.8 | 280.5071 | -195968 | -403769 | 71.3 | 714.6516 |
| 2024/1/3 4:00 | 3.80307 | -3.39749 | 279.9668 | 102690.6 | 281.6863 | -193117 | -544825 | 70.7 | 723.0435 |
| 2024/1/3 5:00 | 3.651871 | -3.38139 | 281.241 | 102613.2 | 283.01 | -204851 | -631104 | 62.8 | 739.9224 |
| 2024/1/3 6:00 | 3.416382 | -3.49152 | 281.3565 | 102582.8 | 282.6455 | -207016 | -596230 | 62.2 | 744.0071 |
| 2024/1/3 7:00 | 3.101166 | -3.547 | 281.2854 | 102605.8 | 282.1333 | -179943 | -449277 | 62.2 | 731.7974 |
| 2024/1/3 8:00 | 2.728531 | -3.40329 | 280.0979 | 102637.9 | 280.3955 | -130659 | -236325 | 66.7 | 684.7405 |
| 2024/1/3 9:00 | 1.544815 | -2.37523 | 279.6558 | 102700.9 | 277.6602 | -57102 | 12297 | 68.2 | 591.3586 |
| 2024/1/3 10:00 | 0.674393 | -1.51591 | 276.8123 | 102701.9 | 276.0566 | -22402 | 67100 | 84.1 | 212.9518 |
| 2024/1/3 11:00 | 0.42952 | -1.47479 | 276.1951 | 102732 | 275.3733 | -14980 | 42080 | 86.2 | 166.0515 |
| 2024/1/3 12:00 | 0.102264 | -1.49185 | 275.7595 | 102748.8 | 274.9893 | -9446 | 31153 | 86.1 | 146.5478 |
| 2024/1/3 13:00 | -0.31573 | -1.26837 | 275.4614 | 102744.3 | 274.2044 | -6831 | 26483 | 85.8 | 121.2237 |
| 2024/1/3 14:00 | -0.71904 | -0.96584 | 274.6453 | 102738.8 | 273.5127 | -6289 | 18678 | 91.1 | 90.89581 |
| 2024/1/3 15:00 | -1.14711 | -0.65862 | 274.4663 | 102724 | 272.9446 | -5503 | 12833 | 91.6 | 60.52576 |
| 2024/1/3 16:00 | -1.33749 | -0.19528 | 274.7607 | 102681.1 | 273.1436 | -4030 | 7652 | 91.5 | 36.18916 |
| 2024/1/3 17:00 | -0.9948 | 0.195633 | 273.2051 | 102651.3 | 272.2495 | -3538 | 3944 | 95.9 | 23.95499 |
| 2024/1/3 18:00 | -0.48663 | 0.495392 | 272.8528 | 102582.6 | 272.4041 | -1657 | 4485 | 96.8 | 26.04924 |
| 2024/1/3 19:00 | -0.2229 | 0.673294 | 272.2515 | 102535.5 | 271.7278 | 1307 | 7164 | 97 | 32.1418 |
| 2024/1/3 20:00 | -0.3653 | 0.84552 | 272.0496 | 102518.3 | 271.4609 | 3794 | 10064 | 97.9 | 43.95619 |
| 2024/1/3 21:00 | -0.57973 | 0.960602 | 272.032 | 102501 | 271.218 | 5921 | 13137 | 98.6 | 56.70392 |
| 2024/1/3 22:00 | -0.48743 | 0.903732 | 272.8679 | 102502.8 | 271.6782 | 8261 | 20053 | 98.1 | 55.32152 |
| 2024/1/3 23:00 | -0.53784 | 0.857986 | 272.8694 | 102563.6 | 272.8738 | 9922 | 24880 | 97.9 | 57.07349 |
| 2024/1/4 0:00 | -0.62798 | 1.90123 | 274.657 | 102596.6 | 275.9673 | -3986 | 10557 | 96.7 | 82.66214 |
| 2024/1/4 1:00 | -0.72537 | 2.108215 | 275.7954 | 102622.9 | 280.3062 | -63380 | -101818 | 93.2 | 343.2891 |
| 2024/1/4 2:00 | -0.75317 | 2.660828 | 279.7888 | 102607.2 | 282.98 | -176016 | -335369 | 78.2 | 395.9968 |
| 2024/1/4 3:00 | -0.67085 | 2.927155 | 280.6533 | 102543.7 | 285.4243 | -260184 | -529082 | 70.5 | 472.9695 |
| 2024/1/4 4:00 | -0.68057 | 3.268509 | 281.2087 | 102401.9 | 287.0271 | -314022 | -618084 | 61.5 | 598.4434 |
| 2024/1/4 5:00 | -0.69067 | 3.326355 | 284.4277 | 102274.9 | 287.6023 | -347212 | -615477 | 49 | 658.6074 |
| 2024/1/4 6:00 | -0.95306 | 3.160065 | 284.8218 | 102139.8 | 287.219 | -336223 | -500594 | 46.3 | 664.3481 |
| 2024/1/4 7:00 | -1.36177 | 2.824097 | 284.721 | 102081.5 | 285.832 | -267956 | -313905 | 45.2 | 637.523 |
| 2024/1/4 8:00 | -1.83095 | 1.902481 | 283.4124 | 102092 | 283.3162 | -176249 | -75281 | 49.6 | 505.2061 |
| 2024/1/4 9:00 | -2.3587 | 0.881699 | 282.4824 | 102122.3 | 279.1367 | -60600 | 84853 | 55.8 | 171.6128 |
| 2024/1/4 10:00 | -2.92708 | 0.954468 | 279.7676 | 102116.1 | 277.6633 | -19641 | 127561 | 71.2 | 139.1135 |
| 2024/1/4 11:00 | -2.87195 | 1.38266 | 279.5574 | 102172.6 | 277.1182 | -16950 | 137770 | 74.4 | 147.6896 |
| 2024/1/4 12:00 | -2.56143 | 1.574905 | 279.45 | 102152.5 | 276.6563 | -15669 | 148872 | 76.6 | 149.6884 |
| 2024/1/4 13:00 | -2.22363 | 1.72467 | 279.5967 | 102142.3 | 276.5508 | -14731 | 155348 | 76.3 | 143.7834 |
| 2024/1/4 14:00 | -1.91582 | 1.774307 | 278.7153 | 102160.8 | 276.1397 | -13649 | 145332 | 80.7 | 129.7496 |
| 2024/1/4 15:00 | -1.61485 | 1.695358 | 278.2698 | 102157.8 | 275.9929 | -11023 | 132759 | 82 | 114.2748 |
| 2024/1/4 16:00 | -1.25148 | 1.477783 | 277.8938 | 102137.9 | 275.1982 | -7579 | 113806 | 81.9 | 96.11679 |
| 2024/1/4 17:00 | -0.7999 | 1.397141 | 276.7778 | 102106.4 | 274.5955 | -4311 | 95381 | 84.2 | 80.95644 |
| 2024/1/4 18:00 | -0.49042 | 1.184464 | 276.3618 | 102093.3 | 274.0686 | -3010 | 74458 | 85 | 65.19846 |
| 2024/1/4 19:00 | 0.176987 | 1.160049 | 276.1218 | 102064.1 | 273.7859 | -6284 | 43232 | 84.9 | 59.50586 |
| 2024/1/4 20:00 | 0.564194 | 1.092499 | 276.1165 | 102063.2 | 273.72 | -5328 | 45385 | 87.4 | 56.86345 |
| 2024/1/4 21:00 | 0.890625 | 1.01355 | 275.9854 | 102104.1 | 273.9773 | -8088 | 39260 | 87.6 | 56.11487 |
| 2024/1/4 22:00 | 1.209457 | 0.578751 | 276.3469 | 102127 | 274.2947 | -9694 | 47974 | 89.4 | 38.23909 |
| 2024/1/4 23:00 | 1.343155 | 0.59642 | 276.761 | 102154.2 | 274.3618 | -11368 | 34903 | 88 | 36.79999 |
| 2024/1/5 0:00 | 1.28717 | 2.256485 | 278.043 | 102228.8 | 278.1614 | -24449 | 10142 | 80.5 | 72.27051 |
| 2024/1/5 1:00 | 1.41333 | 1.531891 | 279.145 | 102300.6 | 282.3262 | -90019 | -104006 | 76.1 | 125.0634 |

这是截取的部分附件2的数据：

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 日期 | AQI指数 | PM2.5 | PM10 | SO2 | NO2 | CO |
| 2024/1/1 | 112 | 84 | 130 | 7 | 29 | 1 |
| 2024/1/2 | 170 | 96 | 7 | 50 | 0.75 | 40 |
| 2024/1/3 | 103 | 77 | 110 | 6 | 29 | 1.02 |
| 2024/1/4 | 113 | 85 | 124 | 8 | 48 | 1.02 |
| 2024/1/5 | 245 | 97 | 9 | 60 | 0.98 | 41 |
| 2024/1/6 | 169 | 128 | 178 | 11 | 79 | 1.47 |
| 2024/1/7 | 114 | 85 | 120 | 8 | 52 | 1.05 |
| 2024/1/8 | 36 | 38 | 7 | 41 | 0.68 | 30 |
| 2024/1/9 | 109 | 82 | 119 | 8 | 53 | 1 |
| 2024/1/10 | 159 | 120 | 158 | 8 | 37 | 1.11 |
| 2024/1/11 | 140 | 106 | 154 | 8 | 63 | 1.1 |
| 2024/1/12 | 102 | 76 | 113 | 9 | 71 | 0.95 |
| 2024/1/13 | 127 | 96 | 140 | 12 | 85 | 1.17 |
| 2024/1/14 | 181 | 109 | 10 | 41 | 0.86 | 74 |
| 2024/1/15 | 58 | 47 | 6 | 23 | 0.65 | 50 |
| 2024/1/16 | 32 | 32 | 7 | 30 | 0.55 | 49 |
| 2024/1/17 | 110 | 60 | 7 | 36 | 0.49 | 60 |
| 2024/1/18 | 166 | 72 | 6 | 47 | 1 | 4 |
| 2024/1/19 | 82 | 35 | 4 | 30 | 0.78 | 32 |
| 2024/1/20 | 121 | 35 | 5 | 28 | 0.9 | 21 |
| 2024/1/21 | 246 | 62 | 5 | 27 | 0.83 | 22 |
| 2024/1/22 | 234 | 43 | 6 | 20 | 0.65 | 48 |
| 2024/1/23 | 99 | 32 | 7 | 18 | 0.63 | 55 |
| 2024/1/24 | 150 | 48 | 8 | 28 | 0.75 | 46 |
| 2024/1/25 | 228 | 70 | 9 | 43 | 0.77 | 37 |
| 2024/1/26 | 249 | 89 | 10 | 55 | 0.82 | 35 |
| 2024/1/27 | 112 | 84 | 117 | 12 | 62 | 0.95 |
| 2024/1/28 | 104 | 78 | 111 | 11 | 62 | 0.97 |
| 2024/1/29 | 111 | 83 | 121 | 10 | 48 | 0.83 |
| 2024/1/30 | 63 | 48 | 6 | 25 | 0.6 | 55 |
| 2024/1/31 | 31 | 29 | 5 | 37 | 0.63 | 15 |
| 2024/2/1 | 15 | 16 | 4 | 26 | 0.58 | 43 |
| 2024/2/2 | 76 | 27 | 4 | 17 | 0.48 | 53 |
| 2024/2/3 | 31 | 17 | 5 | 20 | 0.61 | 48 |
| 2024/2/4 | 87 | 26 | 5 | 20 | 0.74 | 42 |
| 2024/2/5 | 119 | 37 | 5 | 13 | 0.69 | 58 |
| 2024/2/6 | 211 | 77 | 6 | 20 | 0.85 | 52 |
| 2024/2/7 | 150 | 63 | 7 | 21 | 0.88 | 56 |
| 2024/2/8 | 140 | 72 | 9 | 16 | 0.91 | 88 |
| 2024/2/9 | 140 | 107 | 134 | 8 | 20 | 1.08 |
| 2024/2/10 | 177 | 142 | 172 | 10 | 21 | 0.84 |
| 2024/2/11 | 151 | 91 | 8 | 16 | 0.73 | 75 |
| 2024/2/12 | 122 | 79 | 7 | 10 | 0.63 | 93 |
| 2024/2/13 | 69 | 51 | 6 | 8 | 0.5 | 90 |
| 2024/2/14 | 50 | 39 | 7 | 11 | 0.49 | 71 |
| 2024/2/15 | 134 | 42 | 5 | 13 | 0.58 | 55 |
| 2024/2/16 | 49 | 27 | 6 | 7 | 0.7 | 78 |
| 2024/2/17 | 38 | 29 | 6 | 13 | 0.6 | 67 |
| 2024/2/18 | 38 | 28 | 5 | 11 | 0.46 | 61 |
| 2024/2/19 | 137 | 42 | 5 | 18 | 0.63 | 37 |
| 2024/2/20 | 16 | 16 | 4 | 12 | 0.55 | 46 |
| 2024/2/21 | 20 | 14 | 4 | 15 | 0.63 | 40 |
| 2024/2/22 | 95 | 23 | 4 | 18 | 0.6 | 40 |
| 2024/2/23 | 211 | 43 | 5 | 20 | 0.66 | 47 |
| 2024/2/24 | 137 | 47 | 5 | 17 | 0.79 | 51 |
| 2024/2/25 | 144 | 61 | 6 | 12 | 0.69 | 79 |
| 2024/2/26 | 104 | 78 | 103 | 8 | 30 | 0.93 |
| 2024/2/27 | 131 | 70 | 6 | 28 | 0.59 | 69 |
| 2024/2/28 | 76 | 46 | 6 | 40 | 0.68 | 32 |
| 2024/2/29 | 69 | 26 | 5 | 23 | 0.68 | 43 |
| 2024/3/1 | 93 | 37 | 5 | 17 | 0.4 | 73 |
| 2024/3/2 | 154 | 63 | 7 | 35 | 0.51 | 63 |
| 2024/3/3 | 206 | 74 | 7 | 29 | 0.69 | 78 |
| 2024/3/4 | 113 | 51 | 6 | 23 | 0.65 | 79 |
| 2024/3/5 | 24 | 25 | 5 | 33 | 0.8 | 24 |
| 2024/3/6 | 142 | 59 | 6 | 31 | 0.78 | 58 |
| 2024/3/7 | 149 | 73 | 8 | 32 | 0.92 | 77 |
| 2024/3/8 | 288 | 100 | 7 | 29 | 0.83 | 82 |
| 2024/3/9 | 243 | 83 | 7 | 33 | 0.73 | 89 |
| 2024/3/10 | 120 | 63 | 7 | 22 | 0.62 | 98 |
| 2024/3/11 | 127 | 66 | 7 | 46 | 0.77 | 56 |
| 2024/3/12 | 209 | 90 | 7 | 51 | 0.87 | 58 |
| 2024/3/13 | 60 | 45 | 7 | 31 | 0.6 | 75 |
| 2024/3/14 | 127 | 71 | 8 | 59 | 0.56 | 30 |
| 2024/3/15 | 99 | 64 | 8 | 48 | 0.57 | 54 |
| 2024/3/16 | 68 | 45 | 6 | 25 | 0.5 | 79 |
| 2024/3/17 | 129 | 64 | 6 | 33 | 0.65 | 48 |
| 2024/3/18 | 228 | 97 | 6 | 30 | 0.54 | 51 |
| 2024/3/19 | 187 | 77 | 7 | 30 | 0.53 | 57 |
| 2024/3/20 | 101 | 28 | 152 | 8 | 31 | 0.42 |
| 2024/3/21 | 177 | 93 | 8 | 33 | 0.43 | 86 |
| 2024/3/22 | 98 | 59 | 8 | 24 | 0.4 | 109 |
| 2024/3/23 | 161 | 78 | 10 | 53 | 0.63 | 66 |
| 2024/3/24 | 291 | 79 | 6 | 55 | 0.82 | 24 |
| 2024/3/25 | 174 | 37 | 6 | 22 | 0.65 | 50 |
| 2024/3/26 | 35 | 25 | 5 | 18 | 0.55 | 79 |
| 2024/3/27 | 47 | 35 | 7 | 23 | 0.54 | 84 |
| 2024/3/28 | 45 | 35 | 5 | 28 | 0.65 | 48 |
| 2024/3/29 | 53 | 38 | 6 | 35 | 0.56 | 69 |
| 2024/3/30 | 161 | 66 | 8 | 45 | 0.45 | 80 |
| 2024/3/31 | 237 | 105 | 7 | 38 | 0.74 | 90 |
| 2024/4/1 | 229 | 80 | 9 | 35 | 0.75 | 107 |
| 2024/4/2 | 34 | 25 | 5 | 23 | 0.53 | 66 |
| 2024/4/3 | 8 | 21 | 5 | 15 | 0.67 | 62 |
| 2024/4/4 | 144 | 47 | 7 | 23 | 0.77 | 88 |
| 2024/4/5 | 134 | 48 | 8 | 19 | 0.74 | 110 |
| 2024/4/6 | 84 | 35 | 5 | 20 | 0.59 | 84 |
| 2024/4/7 | 113 | 37 | 5 | 23 | 0.52 | 73 |