

Na bazi premera dela sastojine crnog bora u Lipovici, površine  $p = 0.1$  ha i poznate starosti od 55 godina, odrediti i analizirati sledeće elemente rasta i sastojinske izgrađenosti i po potrebi ih grafički predstaviti:

1. Srednje prečnike i visine;      2. Temeljnice i zapremine;

2.1. Temeljnice pojedinačnih stabla, dobijene izrazom  $g = \frac{d^2 \cdot \pi}{40000}$ , upisivati u tabelu koja je u sklopu ovog zadatka.

2.2. Na osnovu stepene funkcije,  $h = 8.0994848 \cdot d^{0.2773501}$ , pomoću koja smo izravnali vezu prečnika i visine nacrtati visinsku krivu na grafikonu iz prethodnog zadatka. Takođe, na osnovu dobijene visinske krive, odrediti i upisati visine na mestima gde nedostaju u tabeli premera iz prethodnog zadatka.

| —    | $d$ [cm] | +     | $v$ [ $m^3$ ]                                                                                      |
|------|----------|-------|----------------------------------------------------------------------------------------------------|
| 9.5  | 10       | 10.49 | $0.003321 + 0.0019551 \cdot h + 0.000212 \cdot h^2 - 0.000008449883 \cdot h^3$                     |
| 10.5 | 11       | 11.49 | $0.019433 - 0.00197 \cdot h + 0.000608 \cdot h^2 - 0.000018 \cdot h^3$                             |
| 11.5 | 12       | 12.49 | $-0.032979 + 0.013841 \cdot h - 0.000671 \cdot h^2 + 0.000015 \cdot h^3$                           |
| 12.5 | 13       | 13.49 | $-0.018609 + 0.012202 \cdot h - 0.000566 \cdot h^2 + 0.000015 \cdot h^3$                           |
| 13.5 | 14       | 14.49 | $-0.044235 + 0.019489 \cdot h - 0.001044 \cdot h^2 + 0.000026 \cdot h^3$                           |
| 14.5 | 15       | 15.49 | $-0.019722 + 0.014333 \cdot h - 0.000514 \cdot h^2 + 0.000012 \cdot h^3$                           |
| 15.5 | 16       | 16.49 | $-0.007571 + 0.012104 \cdot h - 0.000137 \cdot h^2$                                                |
| 16.5 | 17       | 17.49 | $0.01 + 0.01 \cdot h$                                                                              |
| 17.5 | 18       | 18.49 | $0.223156 - 0.059532 \cdot h + 0.008337 \cdot h^2 - 0.000414 \cdot h^3 + 0.000007327232 \cdot h^4$ |
| 18.5 | 19       | 19.49 | $0.013912 + 0.012462 \cdot h$                                                                      |
| 19.5 | 20       | 20.49 | $0.017538 + 0.01378 \cdot h$                                                                       |
| 20.5 | 21       | 21.49 | $-0.044633 + 0.031277 \cdot h - 0.001271 \cdot h^2 + 0.000032 \cdot h^3$                           |
| 21.5 | 22       | 22.49 | $0.023077 + 0.016703 \cdot h$                                                                      |
| 22.5 | 23       | 23.49 | $0.026154 + 0.018297 \cdot h$                                                                      |
| 23.5 | 24       | 24.49 | $0.03 + 0.02 \cdot h$                                                                              |
| 24.5 | 25       | 25.49 | $0.0338462 + 0.0213187 \cdot h$                                                                    |
| 25.5 | 26       | 26.49 | $0.042582 + 0.022802 \cdot h$                                                                      |
| 26.5 | 27       | 27.49 | $-0.110769 + 0.057962 \cdot h - 0.002315 \cdot h^2 + 0.000052 \cdot h^3$                           |
| 27.5 | 28       | 28.49 | $-0.010869 + 0.038017 \cdot h - 0.000767 \cdot h^2 + 0.000017 \cdot h^3$                           |
| 28.5 | 29       | 29.49 | $0.232198 - 0.012326 \cdot h + 0.002885 \cdot h^2 - 0.000064 \cdot h^3$                            |
| 29.5 | 30       | 30.49 | $0.156749 + 0.00896 \cdot h + 0.001426 \cdot h^2 - 0.000029 \cdot h^3$                             |
| 30.5 | 31       | 31.49 | $0.088979 + 0.024003 \cdot h + 0.000711 \cdot h^2 - 0.000018 \cdot h^3$                            |
| 31.5 | 32       | 32.49 | $0.025502 + 0.036402 \cdot h + 0.000158 \cdot h^2 - 0.000007331993 \cdot h^3$                      |
| 32.5 | 33       | 33.49 | $-0.046558 + 0.051162 \cdot h - 0.000499 \cdot h^2 + 0.000003351768 \cdot h^3$                     |
| 33.5 | 34       | 34.49 | $-0.149239 + 0.07371 \cdot h - 0.001758 \cdot h^2 + 0.000029 \cdot h^3$                            |
| 34.5 | 35       | 35.49 | $-0.148236 + 0.077322 \cdot h - 0.001863 \cdot h^2 + 0.000031 \cdot h^3$                           |
| 35.5 | 36       | 36.49 | $-0.084291 + 0.07077 \cdot h - 0.001462 \cdot h^2 + 0.000025 \cdot h^3$                            |
| 36.5 | 37       | 37.49 | $-0.124446 + 0.081256 \cdot h - 0.001933 \cdot h^2 + 0.000034 \cdot h^3$                           |
| 37.5 | 38       | 38.49 | $-0.232142 + 0.103519 \cdot h - 0.003053 \cdot h^2 + 0.000055 \cdot h^3$                           |
| 38.5 | 39       | 39.49 | $-0.029622 + 0.074514 \cdot h - 0.001407 \cdot h^2 + 0.000026 \cdot h^3$                           |

Za određivanje zapremine po jednosantimetarskim debljinskim stepenima, prvo treba locirati kojem stepenu pripada stablo za koje sve vrši izračunavanje, a zatim u pripadajuću regresionu jednačinu zameniti nezavisnu promenljivu iznosom visine (h) u metrima.

2.3. Trenutni broj stabala iznosi  $N/ha = n \cdot \frac{1ha}{p} =$

2.4. Trenutna temeljnica sastojine iznosi  $G = \sum_1^n g \cdot \frac{1ha}{p} =$

2.5. Trenutna zapremina sastojine iznosi  $V = \sum_1^n v \cdot \frac{1ha}{p} =$

| $n$ | $g$  | $v$  | $\frac{h}{d}$ | $r_s$ | $b$ | $l$ | $\frac{l}{h}$ | $\frac{b}{h}$ | $\frac{b}{l}$ | $\frac{b}{d}$ | $Zp$ | $N$ | $G$  | $V$   | $n$ | $g$  | $v$  | $\frac{h}{d}$ | $r_s$ | $b$ | $l$ | $\frac{l}{h}$ | $\frac{b}{h}$ | $\frac{b}{l}$ | $\frac{b}{d}$ | $Zp$ | $N$ | $G$  | $V$   |
|-----|------|------|---------------|-------|-----|-----|---------------|---------------|---------------|---------------|------|-----|------|-------|-----|------|------|---------------|-------|-----|-----|---------------|---------------|---------------|---------------|------|-----|------|-------|
| 1   | 0.05 | 0.5  |               |       |     |     |               |               |               |               |      |     |      |       | 45  | 0.03 | 0.31 |               |       |     |     |               |               |               |               |      |     |      |       |
| 2   | 0.05 | 0.5  |               |       |     |     |               |               |               |               |      |     |      |       | 46  | 0.05 | .    |               | 1.9   | 3.8 |     |               | .             |               | .             | .    | 752 | .    | 376   |
| 3   | 0.04 | 0.34 |               | 1.8   | 3.6 |     |               | .             |               | 16            | .    | 833 | 33.3 | 283.2 | 47  | 0.05 | .    | 70            | .     | .   | 4.7 | .             | 0.2           | .             | 15.7          | 12.6 | .   | 33.8 | .     |
| 4   | 0.03 | 0.21 |               |       |     |     |               |               |               |               |      |     |      |       | 48  | 0.07 | 0.63 | 63            | 2.2   | 4.4 | 5.5 | .             | 0.2           | .             | 14.9          | .    | 559 | 39.1 | 352.2 |
| 5   | 0.06 | 0.59 |               | 2.1   | 4.2 |     |               | 0.2           |               | 15.2          | 13.9 | 612 | 36.7 | 361.1 | 49  | 0.04 | 0.33 | 82            |       |     | .   | 0.2           |               |               |               |      |     |      |       |
| 6   | .    | 0.86 | 72            | 2.4   | .   |     |               | .             |               | .             | 18.1 | 470 | 37.6 | 404.2 | 50  | /    |      |               |       |     |     |               |               |               |               |      |     |      |       |
| 7   | 0.07 | 0.57 | 63            |       |     |     |               |               |               |               |      |     |      |       | 51  | 0.04 | 0.38 |               |       |     |     |               |               |               |               |      |     |      |       |
| 8   | 0.04 | 0.34 |               |       |     |     |               |               |               |               |      |     |      |       | 52  | 0.03 | 0.24 |               |       |     |     |               |               |               |               |      |     |      |       |
| 9   | .    | 0.24 |               |       |     |     |               |               |               |               |      |     |      |       | 53  | 0.03 | 0.24 |               |       |     |     |               |               |               |               |      |     |      |       |
| 10  | 0.03 | 0.24 |               |       |     |     |               |               |               |               |      |     |      |       | 54  | .    | 0.21 |               |       |     |     |               |               |               |               |      |     |      |       |
| 11  | 0.04 | 0.34 |               |       |     |     |               |               |               |               |      |     |      |       | 55  | .    | 0.38 |               |       |     |     |               |               |               |               |      |     |      |       |
| 12  | .    | 0.34 |               |       |     |     |               |               |               |               |      |     |      |       | 56  | /    |      |               |       |     |     |               |               |               |               |      |     |      |       |
| 13  | .    | 0.34 |               |       |     |     |               |               |               |               |      |     |      |       | 57  | 0.05 | 0.46 |               |       |     |     |               |               |               |               |      |     |      |       |
| 14  | 0.06 | 0.59 |               |       |     |     |               |               |               |               |      |     |      |       | 58  | .    | 0.69 | .             | 2.7   | 5.4 | 6.4 | 0.3           | 0.3           | .             | .             | .    | 371 | 26   | 256   |
| 15  | 0.07 | .    | .             | .     | .   | 5   | 0.3           | .             | .             | .             | 19.6 | 434 | .    | 277.8 | 59  | 0.05 | 0.5  |               | 2.1   | .   |     |               | 0.2           |               | 16.2          | 13.9 | .   | .    | 306   |
| 16  | 0.03 | .    |               |       |     |     |               |               |               |               |      |     |      |       | 60  | 0.07 | 0.78 | 72            | 2.3   | .   | .   | .             | 0.2           | .             | .             | .    | 512 | .    | 399.4 |
| 17  | 0.07 | 0.71 | 69            | 2.1   | 4.2 |     |               | .             |               | .             | 13.9 | 612 | 42.8 | .     | 61  | 0.05 | 0.49 | 85            | 2.1   | .   | 8.3 | 0.4           | 0.2           | .             | 16.9          | 13.9 | 612 | .    | 299.9 |
| 18  | 0.06 | 0.51 | 70            | 2     | 4   | .   | 0.2           | 0.2           | .             | .             | 12.6 | .   | 40.5 | 344.2 | 62  | 0.04 | .    |               | .     | 3.4 |     |               | .             |               | .             | 9.1  | .   | 37.4 | .     |
| 19  | 0.02 | 0.2  | 109           |       |     | 4.2 | .             |               |               |               |      |     |      |       | 63  | 0.06 | 0.68 | 77            | 2.2   | 4.4 | .   | 0.4           | .             | .             | 15.3          | 15.2 | 559 | 33.5 | 380.1 |
| 20  | 0.05 | 0.42 |               | .     | .   |     |               | 0.2           |               | 15.8          | .    | 752 | 37.6 | 315.8 | 64  | 0.02 | 0.21 |               |       |     |     |               |               |               |               |      |     |      |       |
| 21  | 0.04 | 0.38 |               |       |     |     |               |               |               |               |      |     |      |       | 65  | 0.05 | 0.53 | 80            |       |     | 7   | 0.3           |               |               |               |      |     |      |       |
| 22  | 0.04 | 0.34 |               |       |     |     |               |               |               |               |      |     |      |       | 66  | 0.07 | 0.79 | 74            | 2.3   | 4.6 | .   | 0.3           | .             | .             | 15            | .    | 512 | 35.8 | .     |
| 23  | 0.06 | 0.59 |               | 2.1   | 4.2 |     |               | 0.2           |               | 15.2          | 13.9 | .   | 36.7 | 361.1 | 67  | 0.06 | 0.54 | .             | .     | .   | 7.1 | 0.4           | 0.2           | .             | 16.5          | .    | 559 | .    | .     |
| 24  | 0.02 | .    |               |       |     |     |               |               |               |               |      |     |      |       | 68  | .    | 0.52 | 81            |       |     | .   | .             |               |               |               |      |     |      |       |
| 25  | .    | 0.27 |               |       |     |     |               |               |               |               |      |     |      |       | 69  | 0.07 | 0.63 | 69            |       |     | 6.9 | 0.3           |               |               |               |      |     |      |       |
| 26  | 0.01 | 0.1  |               |       |     |     |               |               |               |               |      |     |      |       | 70  | 0.04 | 0.35 | 90            |       |     | 5.6 | .             |               |               |               |      |     |      |       |
| 27  | 0.03 | .    |               |       |     |     |               |               |               |               |      |     |      |       | 71  | 0.03 | 0.3  | .             |       |     | 5.2 | .             |               |               |               |      |     |      |       |
| 28  | 0.09 | 0.91 | 70            | .     | 5.2 |     |               | 0.2           |               | 15.7          | .    | 401 | .    | 364.9 | 72  | 0.05 | 0.42 | 80            | 2.2   | .   | 6.4 | 0.3           | 0.2           | 0.7           | 18.2          | 15.2 | 559 | 28   | 234.8 |
| 29  | 0.04 | 0.34 |               |       |     |     |               |               |               |               |      |     |      |       | 73  | /    |      |               |       |     |     |               |               |               |               |      |     |      |       |
| 30  | 0.11 | 1.17 | .             |       |     |     |               |               |               |               |      |     |      |       | 74  | 0.04 | 0.39 | 76            |       |     | .   | .             |               |               |               |      |     |      |       |
| 31  | 0.05 | 0.49 | .             |       |     | .   | 0.3           |               |               |               |      |     |      |       | 75  | 0.06 | 0.51 | .             |       |     |     |               |               |               |               |      |     |      |       |
| 32  | 0.05 | 0.47 | .             |       |     | 7.1 | .             |               |               |               |      |     |      |       | 76  | 0.1  | 1.1  | 66            |       |     |     |               |               |               |               |      |     |      |       |
| 33  | 0.07 | 0.75 | 70            |       |     | 6.4 | .             |               |               |               |      |     |      |       | 77  | 0.06 | 0.54 |               |       |     |     |               |               |               |               |      |     |      |       |
| 34  | 0.01 | 0.09 | .             |       |     | 3.5 | 0.2           |               |               |               |      |     |      |       | 78  | /    |      |               |       |     |     |               |               |               |               |      |     |      |       |
| 35  | 0.04 | .    |               |       |     |     |               |               |               |               |      |     |      |       | 79  | 0.05 | 0.5  |               |       |     |     |               |               |               |               |      |     |      |       |
| 36  | 0.05 | 0.42 |               |       |     |     |               |               |               |               |      |     |      |       | 80  | 0.02 | 0.19 |               |       |     |     |               |               |               |               |      |     |      |       |
| 37  | 0.06 | 0.59 |               |       |     |     |               |               |               |               |      |     |      |       | 81  | 0.08 | 0.85 | .             | .     | .   |     |               | .             |               | 18.2          | 26.4 | .   | 25.8 | .     |
| 38  | /    |      |               |       |     |     |               |               |               |               |      |     |      |       | 82  | 0.04 | 0.42 |               |       |     |     |               |               |               |               |      |     |      |       |
| 39  | 0.03 | 0.22 | 86            |       |     | .   | 0.2           |               |               |               |      |     |      |       | 83  | .    | 0.34 |               |       |     |     |               |               |               |               |      |     |      |       |
| 40  | 0.06 | 0.54 |               | 2.2   | 4.4 |     |               | 0.2           |               | 16.3          | 15.2 | 559 | .    | 301.9 | 84  | 0.04 | 0.38 |               |       |     |     |               |               |               |               |      |     |      |       |
| 41  | 0.05 | .    |               | 2.1   | 4.2 |     |               | 0.2           |               | 16.8          | 13.9 | .   | .    | .     | 85  | 0.07 | 0.6  | 65            | .     | 5   |     |               | 0.3           |               | 17.1          | 19.6 | 434 | 30.4 | .     |
| 42  | 0.05 | .    |               | .     | 4.6 |     |               | 0.2           |               | 18            | 16.6 | 512 | 25.6 | 256   | 86  | 0.03 | 0.28 | 95            |       |     | .   | 0.3           |               |               |               |      |     |      |       |
| 43  | 0.06 | 0.52 | 63            | .     | 5.2 |     |               | 0.3           |               | 18.3          | .    | .   | 24.1 | 208.5 | 87  | 0.04 | 0.38 |               | 1.7   | 3.4 |     |               | 0.2           |               | .             | 9.1  | .   | 37.4 | .     |
| 44  | 0.05 | 0.45 |               | 2.2   | 4.4 |     |               | .             |               | 15.2          | .    | .   | .    |       |     |      |      |               |       |     |     |               |               |               |               |      |     |      |       |