# Small Ranks of Central Unit Groups of Integral Group Rings of Alternating Groups

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In [1] and [2] there are determined the conditions for ranks equal to 0 and 1.

**Theorem** *Let $r_n$ be a rank of central unit groups of integral group rings of alternating group of degree $n$. Then:*
1) *for $n \leqslant 38$ we have*

| $n$ | $r_n$ | $n$ | $r_n$ | $n$ | $r_n$ | $n$ | $r_n$ |
|---|---|---|---|---|---|---|---|
| 1 | 0 | 2 | 0 | 3 | 0 | 4 | 0 |
| 5 | 1 | 6 | 1 | 7 | 0 | 8 | 0 |
| 9 | 0 | 10 | 1 | 11 | 1 | 12 | 0 |
| 13 | 1 | 14 | 3 | 15 | 3 | 16 | 1 |
| 17 | 1 | 18 | 4 | 19 | 5 | 20 | 2 |
| 21 | 1 | 22 | 5 | 23 | 7 | 24 | 4 |
| 25 | 1 | 26 | 5 | 27 | 12 | 28 | 9 |
| 29 | 3 | 30 | 6 | 31 | 14 | 32 | 13 |
| 33 | 6 | 34 | 7 | 35 | 20 | 36 | 23 |
| 37 | 11 | 38 | 10 | | | | |

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2) *for $n \geqslant 39$ we have $r_n \geqslant 11$.*

## References

[1] **Ferraz R.A.** Simple components and central units in group rings // J. Algebra. 2004. Vol. 279, no. 1. P. 191–203.

[2] **Aleev R.Zh., Kargapolov A.V., Sokolov V.V.** The ranks of central unit groups of integral group rings of alternating groups // Journal of Mathematical Sciences, 2010, Vol. 164, no. 2, P. 163–167.