Feedback on Section 48.8

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- On page 499, equation (48.21). This should be written as
$$a_{ij}^2 \geq \text{average of } \{a_{rs}^2 : r < s\} = \frac{\mathrm{off}(A)^2/2}{(n-1)n/2} = \frac{\mathrm{off}(A)^2}{(n-1)n}.$$
In this way, the equation (48.22) can be written as
$$\begin{aligned} \mathrm{off}(\widetilde{A})^2 &= \mathrm{off}(A)^2 - 2a_{ij}^2 \quad \text{by equation (48.20)} \\ &\leq \mathrm{off}(A)^2 - 2\left(\frac{\mathrm{off}(A)^2}{(n-1)n}\right) \\ &= \left(1 - \frac{2}{(n-1)n}\right)\mathrm{off}(A)^2. \end{aligned}$$

- On page 500

  A good choice is $\epsilon_k = \mathrm{off}(A_k)/\sqrt{(n-1)n/2}$.

  I notice that this is coming from [1, 1998, Sec. 9.4.3]. From the settings in your book and the definition of ω in [1], we have
$$2\omega = \mathrm{off}(A_k)^2, \quad N = \frac{n(n-1)}{2}.$$
Hence we get the
$$\epsilon_k := \tau = \sqrt{\omega/N} = \sqrt{\frac{\mathrm{off}(A_k)^2/2}{n(n-1)/2}} = \frac{\mathrm{off}(A_k)}{\sqrt{n(n-1)}},$$
instead of $\epsilon_k = \mathrm{off}(A_k)/\sqrt{(n-1)n/2}$ which is defined in your book.

- In Algorithm 48.12, line 18, it should write $D = \mathrm{diag}(\mathrm{diag}(A))$. Since you haven't defined what λ_is are.

- On page 501

  > *Convergence has been proved for the cyclic Jacobi method under mild assumptions. Both the classical and the cyclic method have asymptotic quadratic convergence.*

  As a reader, I think it's better if you could add some references for this asymptotic quadratic convergence. Such as for classic Jacobi method [2], and for cyclic Jacobi method [3, 4].

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References

[1] Beresford N. Parlett. *The Symmetric Eigenvalue Problem*. Society for Industrial and Applied Mathematics, January 1998. ISBN 978-0-89871-402-9. (Cited on p. 1.)

[2] H. P. M. van Kempen. On the convergence of the classical Jacobi method for real symmetric matrices with non-distinct eigenvalues. *Numerische Mathematik*, 9(1):11–18, 1966. (Cited on p. 1.)

[3] H. P. M. van Kempen. On the quadratic convergence of the special cyclic Jacobi method. *Numerische Mathematik*, 9(1):19–22, 1966. (Cited on p. 1.)

[4] J. H. Wilkinson. Note on the quadratic convergence of the cyclic Jacobi process. *Numerische Mathematik*, 4(1):296–300, 1962. (Cited on p. 1.)