CREATIVE MATH. & INF.
18 (2009), No. 1, 6 - 9

Online version available at http://creative-mathematics.ubm.ro/
Print Edition: ISSN 1584 - 286X Online Edition: ISSN 1843 - 441X

A note on a difference inequality used in the iterative approximation of fixed points

VASILE BERINDE

ABSTRACT.

In this note we present a more detailed proof of Lemma 2 in [Liu, L.S., *Ishikawa and Mann iteration process with errors for nonlinear strongly accretive mappings in Banach spaces*, J. Math. Anal. Appl., **194** (1995), 114-125], regarding the global asymptotic stability of the solution of a first order difference inequality.

ACKNOWLEDGEMENTS

The research was supported by the CEEX Grant 2532 of the Romanian Ministry of Education and Research. The author also thanks Abdus Salam International Centre for Theoretical Physics (ICTP) in Trieste, Italy, where he was a visitor during the writing of this paper.

REFERENCES

[1] Agarwal, R.P., Cho, Y.J., Li, J., Huang, N.-J., *Stability of iterative procedures with errors approximating common fixed points for a couple of quasi-contractive mappings in q-uniformly smooth Banach spaces*, J. Math. Anal. Appl., **272** (2002), No. 2, 435-447
[2] Babu, G.V.R., Sandhya M.L. and Kameswari M.V.R., *A note on a fixed point theorem of Berinde on weak contractions*, Carpathian J. Math., **24** (2008), No. 1, 8-12
[3] Berinde, V., *Summable almost stability of fixed point iteration procedures*, Carpathian J. Math. **19** (2003), No. 2, 81-88
[4] Berinde, V., *Iterative Approximation of Fixed Points*, 2nd edition, Springer Verlag, Berlin Heidelberg New York, 2007
[5] Cauchy, L. A., *Analyse algébrique*, L'Impremerie Royale, Paris, 1821 (Reprinted by Editions Jacques Gabay, Sceaux, 1989)
[6] Fukharuddin, H., Khan, S.H., *Convergence of iterates with errors of asymptotically quasi-nonexpansive mappings and applications*, J. Math. Anal. Appl., **328** (2007), 821-829
[7] Jung, J.S., Cho, Y.J., Agarwal, R.P., *Iterative schemes with some control conditions for a family of finite nonexpansive mappings in Banach spaces*, Fixed Point Theory Appl., **2005**, No. 2, 125-135
[8] Knopp, K., *Theory and applications of infinite series*, Blackie & Son, London and Glasgow, 1964
[9] Liu, Z., Kang, S.M., Ume, J.S., *Error bounds of the iterative approximations of Ishikawa iterative schemes with errors for strictly hemicontractive and strongly quasiaccretive operators*, Commun. Appl. Nonlinear Anal., **9** (2002), No. 4, 33-46
[10] Liu, L.S., *Ishikawa and Mann iteration process with errors for nonlinear strongly accretive mappings in Banach spaces*, J. Math. Anal. Appl., **194** (1995), 114-125
[11] Olatinwo, M.O., *Some stability results for nonexpansive and quasi-nonexpansive operators in uniformly convex Banach space using the Ishikawa iteration process*, Carpathian J. Math. **24** (2008), No. 1, 82-87
[12] Osilike, M.O., *Stability of the Mann and Ishikawa iteration procedures for ϕ-strong pseudocontractions and nonlinear equations of the ϕ-strongly accretive type*, J. Math. Anal. Appl., **227** (1998), No. 2, 319-334
[13] Păcurar, M., *Viscosity approximation of fixed points with φ-contractions*, Carpathian J. Math. **24** (2008), No. 1, 88-93
[14] Shahzad, N., Zegeye, H., *On stability results for Φ-strongly pseudocontractive mappings*, Nonlinear Analysis, **64** (2006), 2619-2630
[15] Shu, X.B., Li, Y.J., *Ishikawa iterative process for constructing solutions of k-subaccretive operator equations*, Far East J. Math. Sci. **11** (2003), No. 2, 215-228
[16] Zegeye, H., Shahzad, N., *Convergence theorems for Ψ-expansive ans accretive mappings*, Nonlinear Analysis, **66** (2007), 73-82
[17] Zhang, S.S., Lee, H.W.J., Chan, C.K., *Approximation of nearest common fixed point of nonexpansive mappings in Hilbert spaces*, Acta Math. Sinica **23** (2006), No. 10, 1889-1896
[18] Weng, X., *Fixed point iteration for local strictly pseudo-contractive mapping*, Proc. Amer. Math. Soc., **113** (1991), No. 3, 727-731

DEPARTMENT OF MATHEMATICS AND
COMPUTER SCIENCE
NORTH UNIVERSITY OF BAIA MARE
VICTORIEI 76
430122 BAIA MARE, ROMANIA
E-mail address: vberinde@ubm.ro
E-mail address: vasile_berinde@yahoo.com

Received: 25.02.2009; In revised form: 04.03.2009.; Accepted:
2000 *Mathematics Subject Classification.* 39A11, 39A99, 40A05.
Key words and phrases. *Difference inequality, zero solution, asymptotic stability, Cauchy's lemma.*