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Research Article

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A Remark on Regular Generalized B- Closed Sets

Adhiya K. Hussain

Department of Mathematics, College of Basic Education, Al- Mustansiriyah University, Baghdad, Iraq

Abstract The aim of this note is to show that every subset of a given topological space is a regular generalized b- closed set. This is a correction for a paper of Mariappa and Sekar [2].

Keywords rgb- closed set, b- open set, regular open set.

Introduction

Mariappa and Sekar [2], introduced and studied the notion of regular generalized b- closed (briefly rgb- closed) sets.

Let A be a subset of a topological space (X,τ). Then A is called regular open [3] (resp. b- open [1]) set if $A=\operatorname{int}(cl(A))$ (resp. $A\subset cl(\operatorname{int}(A))\cup\operatorname{int}(cl(A))$).

The complement of b-open set is called b- closed. The b- closure of a set A, denoted by bcl(A), is the intersection of all b- closed supersets of A. Since the union of b- open sets is also b-open, the b- closure of every set is b- closed.

The main purpose of this paper is to show that every subset of any topological space is *rgb*- closed set and hence every type of known generalized closed set is rgb- closed. We want to clarify this remark because nowadays several papers have investigated concepts depending on the above closed sets. We will show that most results of [2] are either trivial or false.

2. Every subset of a space X is rgb- closed.

Definition 2.1 [2]

A set A of a space X is called regular generalized b- closed [2] (briefly *rgb*- closed)) set if $bcl(A)\subset U$, whenever $A\subset U$ and U is regular open.

It is easy to prove the following lemma.

Lemma 2.2

For any subset A of X, the following results hold.

(1) $A\subseteq B \Rightarrow bcl(A)\subseteq bcl(B)$.

(2) $bcl(A)=A \Leftrightarrow$ A is b-closed.

Lemma 2.3 [1]

For any subset A of X, the following results hold.

(1) $bcl(A)=scl(A)\cap pcl(A)$.

(2) $scl(A)=A\cup int(cl(A))$.

(3) $pcl(A)=A\cup cl(int(A))$.

Theorem 2.4

Every subset of a space (X, τ) is rgb- closed.

Proof

Let A be a subset of X and U be regular open subset of X such that A $\subseteq$ U. Then $bcl(A) \subseteq bcl(U)$. But, by Lemma 2.3, $bcl(U)$ = sclU $\bigcap$ pcl$U$ = ($U \bigcup$ int(cl(U)) $\bigcap$ (U $\bigcup$ cl(int(U))= U $\bigcup$ (int(cl(U)) $\bigcap$ cl(int(U)))= U $\bigcup$ (U $\bigcap$ cl(int(U))), since U regular open.but (U $\bigcap$ cl(int(U))) $\subseteq U \bigcap$ cl(U)= U. Therefore $bcl(A) \subseteq bcl(U)$ $\subseteq$ U. Therefore A is rgb- closed.

Remark 2.5

In [2], Theorems 3.2, 3.4, 3.6, 3.8, 3.10, 3.12, 3.14, 3.16, 3.18, 3.20, 3.21and 3.23 are trivial. Remarks 3.25, 3.26, 3.27and 3.28 are false. Furthermore, most of the definitions and results in sections 4 and 5 are trivial.

References

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