Corrections

for

A Course in Point Set Topology

Springer UTM

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This is a list of corrections for my book *A Course in Point Set Topology* published in 2013 by Springer-Verlag. The following mathematicians have helped me to compile this list. Fred Linton, Yuxi Liu.

I would appreciate any further corrections or comments you have.

Notes in boldface are not part of the correction.

Page	Line	From	To
10		**Add the following as Exercise 14.**	(14) If (X, d) is a separable metric space and $Y \subseteq X$, show that (Y, d) is a separable metric space.
12	-13	If $A \subseteq X$ and	If $A \subseteq X$, $A \neq \emptyset$, and
29	12	Delete Exercise 5. It's false.	
35	-17	copy of $\mathbb{R}$	copy of $[0, 1]$
35	-14	$X = \mathbb{R} \times I$	$X = [0, 1] \times I$
35	-12	$d(x, y) = 1$	$d(x, y) = 2$
35	-11	$\mathbb{R} \times I$	$[0, 1] \times I$
38	4	of closed	of distinct closed
44	17	if every	if $\mathcal{B} \subseteq \mathcal{T}$ and every
46	-3	ordered set and $\mathcal{S}$	ordered set such that for x either there is a distinct y with $x \leq y$ or there is a distinct z with $z \leq x$ and
48	-19	every A	every B
66	-9	onto $\phi(X_i)$	onto $\phi(X_j)$
67	9	**Delete the last sentence and substitute the following.** (a) If I is countable and each X_i is separable, show that X is separable. (b) If X is separable, then each X_i is separable.	
82	-5	**Delete the first sentence of the proof that (a) and (d) are equivalent. What remains is a proof that (a) implies (d). We need a proof that (d) implies (a). Here it is.**	

According to the preceding lemma, (d) says that the topology on X, $\mathcal{T}$, is the same as the weak topology $\mathcal{T}_c$. So we want to prove that X is completely regular. Let F be a closed subset of X and let $x \in X \backslash F$. By Proposition 2.6.2 there are continuous functions $g_1, \ldots, g_n$ from X into $\mathbb{R}$ and positive numbers $\delta_1, \ldots, \delta_n$ such that

$$\bigcap_{j=1}^{n} g_j^{-1}(\{t \in \mathbb{R} : |t - g_j(x)| < \delta_j\}) \subseteq X \backslash F$$

Replacing each g_j by $k_j(y) = (\delta_j)^{-1} |g_j(y) - g_j(x)|$, this means that

$$\bigcap_{j=1}^{n} k_j^{-1}\{(-1, 1)\} \subseteq X \backslash F$$

If $f(y) = \min\{1, k_1(y), \ldots, k_n(y)\}$, then $f : X \to [0, 1]$ is continuous, $f(x) = 0$, and $f(y) = 1$ for all y in F. It follows that X is completely regular.

Page	Line	From	To
88	-3	X. The	X. For simplicity assume no proper subcover of $\{G_1, \ldots, G_{n+1}\}$ covers X. The
92	-10	$f^\beta \circ \tau$	$f^\beta \circ \tau = f$
92	-1	$f^Z[\omega(\sigma(x))]$	$f^\beta[\omega(\sigma(x))]$
93	2	**In the diagram replace f^Z by f^β**	
98	19	**Add the following before Proposition 3.5.11.** Recall the metric $\rho(f, g)$ (3.1.1) defined on $C_b(X)$	
101	-8	forrest	forest
101	-7	3.5.11	3.3.11
102	11	≤ 1. Let	≤ 1. (Corollary 3.3.11 requires that X be normal. How can you bypass this in the present situation?) Let
103	11	to generate	(Exercise 1.1.14) to generate
103	-2	$\epsilon/2$	$\epsilon/4$
104	-20	$K_n = \{x \in X : \lvert\phi_k(x)\rvert \geq 1/n \ldots\}$	$K_n = \{x \in X : \text{there is } k, 1 \leq k \leq n, \text{with } \lvert\phi_k(x)\rvert \geq 1/n\}$
105		**Delete Exercise 14 and renumber the following exercises. It is the same as Exercise 1.5.6.**	

108	2	$\{(a,b] : a, b \ldots\}$	$\{(a,b] : a, b \ldots\} \cup \{0\}$
108	-19	By (c), $x_n \to x$.	Let $a_n \in F \cap (x_n, x_{n+1})\}$. By (c), $a_n \to x$.
109	-15	We assume ... claim.	We establish the following claim.
114	5	$G \cap X_n \neq 0$	$G \cap X_n \neq \emptyset$
114	3	**I am not sure this corollary is true. The proof has a gap in the given proof where it is assumed that each $\mathcal{A}_n$ is locally finite in X.**	