ERRATA FOR GRADUATE ALGEBRA: NONCOMMUTATIVE VIEW

LOUIS ROWEN

1. Nilpotence of the radical of a left Artinian ring, p. 50

Page 51: The proof of Theorem 15.18(iv) needs another two lines:

Suppose $J^k = J^{k+1}$. We claim that $J^k = 0$. Otherwise $J^k a \neq 0$ for some $a \in J$, so take $0 \neq a' \in J^k a$. Then $a' \in J^{k+1}a = Ja'$, so $Ra' = Ja' = J(Ra')$ implying $Ra' = 0$ by Remark 15.3, a contradiction.

2. Nichols-Zoeller Theorem, p. 559

Page 558 line -3: The tensor products in the statement of Proposition 26.27 should be over the base field F, and not over K as written.

This causes a gap in the proof of the Nichols-Zoeller Theorem (Corollary 26.28) which can be filled as follows, using facts about left integrals, cf. Remark 26.31:

Lemma: If M is a f.g. module over a f.d. Hopf algebra H such that $M^{(j)}$ is a free H-module for some j, then M is already free.

Proof: Write $H = \oplus P_i$, a direct sum of indecomposable projective H-modules. Then any left integral t of H decomposes as $\sum t_i$. Each $t_i \in P_i$ is also a left integral and thus a multiple of t; hence, we may assume that $t = t_1 \in P_1$, and all the other P_i are not isomorphic to P_1. By assumption, $M^{(j)} \cong H^{(u)}$ for some u. But then the Krull-Schmidt theorem shows that M must be a direct sum of the P_i. If P_1 appears k times in M, then $jk = u$, and consequently $M \cong H^{(k)}$. $\square$

3. misprints

- Page 46 line -2: submodule of M;
  Page 144 line 11: V is a vector space of dimension n
- Page 150 line -9: $\prod L[\lambda]/L[\lambda]g_i$
- Page 157 line 11: by Corollary 5.16′
- Page 169 line 22,23: for every element a in a
- Page 240 these irreducible components
- Page 245: $F_0 = \mathbb{Q}$ (throughout Step III of the proof).
- Page 389 Exercise 33: Define $U_{a,c} = U_{a+c} - U_a - U_c$.
- Page 467 line 16: is a prime ring (of dimension n^2)

Department of Mathematics, Bar-Ilan University, Ramat-Gan 52900, Israel
E-mail address: rowen@macs.biu.ac.il