ERRATA FOR GRADUATE ALGEBRA: NONCOMMUTATIVE VIEW

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Page 29 line -14: The Weyl algebra is left Noetherian (by Exercises 13A5 and 13A7) but not a PLID; Exercise 13A8 is not applicable until one localizes at x.

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

Page 51 Theorem 15.18: The proof of (iv) needs modification, since we do not know yet that A is finitely generated. Instead, suppose that $J^k = J^{k+1}$. 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. The regular representation of a group, Chapters 19 and 20

There is a better way to prepare Example 20.7, which deals with $\chi_{\mathrm{reg}} := \chi(\rho_{\mathrm{reg}})$. First of all, note that ρ_{reg} operates on G (and thus on the group algebra $F[G]$) by left multiplication, so corresponds to $F[G]$ itself as an $F[G]$-module which, in terms of Remark 19.35, could be viewed as $\oplus L_i^{(n_i)}$ when F is a splilting field of G. Taking traces yields Example 20.7 at once.

3. Lie algebras, p. 284

After Proposition 21.30 one should add the obvious corollary that L is solvable iff L' is solvable, since L/L' is Abelian.

Then in page 288, line 8, we should first say L' is solvable, and this implies L is solvable.

4. 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 $M \cong H^{(k)}$. $\square$

5. misprints and minor changes

- Page xxv, line -8 any $\alpha_1, \dots, \alpha_{n^2} \in F$.
- 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: (remove duplication) for every element a in a
- Page 186 line -4: $Q \cap S = 0$
- Page 214 line -14: Exercise 19.6(i)
- Page 240 line 1,2: so are Sg and gS, of the same dimension
- Page 245: $F_0 = \mathbb{Q}$ (throughout Step III of the proof).

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- Page 282 line -8: $L^{(k)} = [L^{(k-1)}L^{(k-1)}]$.
- Page 285 line -12: $Lv \subseteq Fv$.
- Page 289 line -5: $[(a_1, b_1)(a_2, b_2)] = ([a_1a_2], [b_1b_2])$;
- 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)
- page 472 line 1: $\bar{F}(\Lambda)$ instead of $\bar{F}$.
- Page 630 [Hof] "Goedel, Escher, Bach: an Eternal Golden Braid".

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