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Corrigendum to On some multiplicity and mixed multiplicity formulas

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(1) Page 425, line 1↑: Replace $\Re(\mathbf{I}^{\mathbf{u}};\overline{N})_P = \overline{N}_{\mathfrak{p}}$ by $\ell(\Re(\mathbf{I}^{\mathbf{u}};\overline{N})_P) = \ell(\overline{N}_{\mathfrak{p}})$.

Proof. Indeed, since

$$\begin{aligned}\Re(\mathbf{I}^{\mathbf{u}};R)_P/P\Re(\mathbf{I}^{\mathbf{u}};R)_P &\cong (\Re(\mathbf{I}^{\mathbf{u}};R)/P)_P\\ &\cong \Re(\mathbf{I}^{\mathbf{u}};R/\mathfrak{p})_P,\end{aligned}$$

it follows that $\Re(\mathbf{I}^{\mathbf{u}};R/\mathfrak{p})_P$ is a simple $\Re(\mathbf{I}^{\mathbf{u}};R)_P$-module. Now assume that

$$\ell_{R_{\mathfrak{p}}}(\overline{N}_{\mathfrak{p}}) = t.$$

Then there exists a sequence of submodules of the R-module $\overline{N}$,

$$\overline{N} = N_0 \supset N_1 \supset \cdots \supset N_t = \{0\},$$

such that

$$(N_i/N_{i+1})_{\mathfrak{p}} \cong R_{\mathfrak{p}}/\mathfrak{p}R_{\mathfrak{p}}, \quad 0 \le i \le t-1.$$

Remember that $\mathfrak{p} \not\supseteq I$, it can be verified that

$$\begin{aligned}\frac{\Re(\mathbf{I}^{\mathbf{u}};N_i)_P}{\Re(\mathbf{I}^{\mathbf{u}};N_{i+1})_P} &\cong \left(\frac{\Re(\mathbf{I}^{\mathbf{u}};N_i)_{\mathfrak{p}}}{\Re(\mathbf{I}^{\mathbf{u}};N_{i+1})_{\mathfrak{p}}}\right)_P\\ &\cong \Re(\mathbf{I}^{\mathbf{u}};(N_i/N_{i+1})_{\mathfrak{p}})_P\\ &\cong \Re(\mathbf{I}^{\mathbf{u}};R_{\mathfrak{p}}/\mathfrak{p}R_{\mathfrak{p}})_P\\ &\cong \Re(\mathbf{I}^{\mathbf{u}};R/\mathfrak{p})_P.\end{aligned}$$

So $\frac{\Re(\mathbf{I}^{\mathbf{u}};N_i)_P}{\Re(\mathbf{I}^{\mathbf{u}};N_{i+1})_P}$ is a simple $\Re(\mathbf{I}^{\mathbf{u}};R)_P$-module $(0 \le i \le t-1)$. By the above facts, we get a composition series of the $\Re(\mathbf{I}^{\mathbf{u}};R)_P$-module $\Re(\mathbf{I}^{\mathbf{u}};\overline{N})_P$

$$R(\mathbf{I}^{\mathbf{u}};\overline{N})_P = R(\mathbf{I}^{\mathbf{u}};N_0)_P \supset R(\mathbf{I}^{\mathbf{u}};N_1)_P \supset \cdots \supset R(\mathbf{I}^{\mathbf{u}};N_t)_P = \{0\}.$$

Consequently $\ell(\Re(\mathbf{I}^{\mathbf{u}};\overline{N})_P) = \ell(\overline{N}_{\mathfrak{p}})$. □

(2) Page 440, line 6↑: Replace

$$e\left(\Re\left(I; \frac{N}{(x_1, \ldots, x_p)N : I^\infty}\right)\right) = e\left(J; \frac{N}{(x_1, \ldots, x_p)N : I^\infty}\right)$$

by

$$e\left(\mathfrak{J}; \Re\left(I; \frac{N}{(x_1, \ldots, x_p)N : I^\infty}\right)\right) = e\left(J; \frac{N}{(x_1, \ldots, x_p)N : I^\infty}\right).$$

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