A reflexive Banach algebra whose dual is also a Banach algebra.

****

The Banach algebra l^p[1]$, 1 < p < \infty$ has the conjugate l^q, $q = \dfrac{p}{p-1}$, in addition $(l^q)^{\#} = l^p$.

[1] Let (Ω, μ) be a measure space and $L^p(\Omega, \mu)$ for $1 \leq p < \infty$ be the set of all complex valued measurable functions f on Ω (we assume f is equal to g if $f = g$ a.e.$[\mu]$) for which $||f||_p = (\int_\Omega |f|^p d\mu)^{\frac{1}{p}} < \infty$. $L^p(\Omega, \mu)$ with the norm $||.||_p$ is a Banach space and is a Hilbert space iff $p = 2$. $L^p(\Omega, \mu)$ denoted by $l^p(\Omega)$ if μ is counting measure. In particular, $l^p(\mathcal{N})$ denoted by l^p.

If $1 \leq p < \infty$, then l^p can be regarded as a commutative Banach algebra with coordinatewise multiplication. (For $p > 1$, $||fg||_p \leq ||f||_p ||g||_p$ is a conclusion of Hőlder inequality.) The l^p, $1 \leq p < \infty$, with the involution $f \longmapsto \overline{f}$ is an involutive Banach algebra.