AKT-091013, Hour 15: More on U(g)

October-07-09
5:56 PM

Participation form.
Next class may be beautiful!
HW1 is due today.

Some properties of $U(\mathfrak{g})$, to be interpreted in $\mathcal{A}$ & $\mathcal{K}$:

1. $U(\mathfrak{g})$ is an algebra (non-commutative!)
2. $U(\mathfrak{g})$ is a co-algebra (co-commutative).
3. $U(\mathfrak{g}_1 \oplus \mathfrak{g}_2) = U(\mathfrak{g}_1) \otimes U(\mathfrak{g}_2)$
4. $U(\mathfrak{g}) \cong S(\mathfrak{g})$ as v.s. & co-algebras.

1. $\mathcal{A} \otimes \mathcal{A} \to \mathcal{A}$
   $U \otimes U \to U$
2. $\mathcal{A}(1) \to \mathcal{A}(11)$
   $U \to U^{\otimes 2}$
3. $\mathcal{A} \to \mathcal{A} \otimes \mathcal{A}$
   $U(\mathfrak{g}_1 \oplus \mathfrak{g}_1) \xrightarrow{\sim} U(\mathfrak{g}_1) \otimes U(\mathfrak{g}_2)$

4. is PBW, generalizes to $\mathcal{A}(\mathbb{1}_n) = \mathcal{D}(n) = \mathcal{A}(*)$