Guidelines on the annotation of Common Core knowledge components (KCs) on math question solutions

* Annotate the lowest KC that can be applied for the solution
* If a solution requires application of multiple KCs, select the minimum set of the required KCs
  + See KCs separated by commas in the sample annotations
* If a KC is applied to multiple steps, annotate the steps with the same KC
  + This guideline is applied for e.g. (A+B) and (A+B)+C, but not A+B and C+D in a solution
  + e.g. Rows 13,14 in the sample annotations
* Select KC, not based on symbols used in solution, but based on capability required for solution
* if a KC is not strictly applied to multiple steps due to non-essential notations but if the steps can be solved by using the KC, annotate the steps with the KC
  + e.g. For the question “Weng earns $12 an hour for babysitting. Yesterday, she just did 50 minutes of babysitting. How much did she earn?”, the given steps are “<<12/60=0.2>>” and “<<0.2\*50=10>>”. But the decimal notation of the first step (12/60=0.2) is not required, and the two steps (12/60=0.2, 0.2\*50=10) can be solved by 4.NF.4 alone.
* If KC1 and KC2 are similar to each other and KC1, but not KC2, is to “solve word problem”, we annotate KC1 on word problem questions and KC2 on equation problems (e.g. “What is the value of $9^3 + 3(9^2) + 3(9) + 1$?”).
  + For instance, consider
    - 2.OA.1: Use *addition and subtraction within 100* to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions,
    - 2.NBT.5: Fluently *add and subtract within 100* using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.
  + More example pairs of such KCs
    - 1.OA.1 – 1.OA.6 (“Add and subtract within 20”)
    - 3.OA.3 – 3.OA.7 (“multiplication and division within 100”)
* If KC1 and KC2 are similar to each other and KC1’s description, but not KC2’s description, has ‘fluently’ or ‘fluency’, we interpret that KC2 is applied for one operation and that KC1 is applied for multiple operations.
  + We annotate 2.NBT.7 on e.g. the step “200+300=500”, when 500 is not used for any other addition and subtraction, and 3.NBT.A on e.g. two steps of “200+300=500” and “500+400=900” in a solution.
  + Solutions with multiple operations in a single step, e.g. “200+100+150 = 450”, will also be annotated as KC2
* Differentiate decimal numbers (e.g. 0.1) from fractions (e.g. 1/10), since decimal numbers (Grade 4) are introduced later than fractions (Grade 3)
* Differentiate percentages and ratio (e.g. 20%, 1:2) from decimal numbers (e.g. 0.1), since percentages and ratio (Grade 6) are introduced later than decimal numbers (Grade 4)
* If some equations are not extracted as steps, add new rows to include the missing steps