ISA relationships

Inheritance is not a new concept to computer science majors. The ISA relationship is inheritance as it pertains to data.

Let’s look at the following Entities:

Student
  SSN
  Name

Graduate student
  GS6 filed
  Research field

Undergraduate student
  Concentration
  Honors

This is a typical ISA relationship, the attributes for student are general, ie every student has these attributes. Above and beyond that – there are attributes specific to the type of student they are – i.e. if they are a graduate student, we need to know if they have filed a GS6 and what their research field is; if they are an undergraduate student we need to know what their concentration is and if they are an honors student.
Specialization is the downward path on this diagram. Students are specialized into either Graduate or Undergraduate. Generalization is the upward path on this diagram. Undergraduate and Graduate are generalized into Students.

Overlap constraints – can a student be both a graduate student and an undergraduate student? If the answer is yes, call that overlapping specialization, if not it is called disjoint specialization. For overlapping, two separate arrows are used. For disjoint, a single arrow is used as above.