Elliot Smith

Exercise 1 - RA & RC

Part I - Relational Algebra

1. Which beans are in the coffee named “Blend 101”?

PROJECT (BEAN\_NAME) (SELECT (COFFEE = “Blend 101”) (HAS\_BEAN))

1. Which people drink a coffee that contains the “Pacas” coffee bean?

PROJECT (PERSON) (SELECT (BEAN\_NAME = “Pacas”) (DRINKS \* HAS\_BEAN))

1. Who does not drink a coffee containing a bean from the location “Rwanda”?

PROJECT (PERSON) (DRINKS) - PROJECT (PERSON) (SELECT (FROM\_LOCATION = “Rwanda”) (DRINKS \* HAS\_BEAN \* BEAN))

Part II - Relational Calculus

1. Which locations contribute a bean to the coffee named “Garuda blend”?

{b.FROM\_LOCATION | BEAN(b) and EXISTS(h)(HAS\_BEAN(h) and b.BEAN\_NAME = h.BEAN\_NAME and h.COFFEE = “Garuda blend”)}

1. Who has never tried a coffee containing a bean from the location “Hawaii”?

{d1.PERSON | DRINKS(d1) and NOT EXISTS(d2, h, b)(DRINKS(d2) and HAS\_BEAN(h) and BEAN(b) and b.FROM\_LOCATION = “Hawaii” and d2.COFFEE = h.COFFEE and h.BEAN\_NAME = b.BEAN\_NAME and d1.PERSON = d2.PERSON)}

1. Which people drink all of the coffees containing the bean “Caturra”?

{d1.PERSON | DRINKS(d1) and FORALL(h)(HAS\_BEAN(h) and h.BEAN\_NAME = “Caturra” => EXISTS(d2)(DRINKS(d2) and d2.COFFEE = h.COFFEE and d2.PERSON = d1.PERSON))}