

ESS418 Research Methods in Social Science

Assignment 1: Qualitative Comparative Analysis

Submit due to: 30. 11. 2015

Student's name:

1) What distinguished set-theoretical methods from non-set-theoretical methods?

2) In fuzzy set analysis, a truth table is produced based on fuzzy data. What does it mean when we say that a given truth table row contains x number of cases?

3) Perform Boolean multiplication for the following pairs of expressions and simplify

the result:

- a) $(A + B)$ and $(A * B)$
- b) $(A + B)$ and $(A + B + C)$
- c) $(A * B)$ and $(\sim A * \sim B)$
- d) $(A * (B+C))$ and $(B * (\sim A+C))$

4) A case has a membership of 1 set A, 0 in set B, 0.6 in set C, 0.9 in set D, and 0.1 in set E. Calculate its membership in the following Boolean expressions:

- a) $(A + B + D)$
- b) $(A*B) + (C*\sim D)$
- c) $\sim(A*\sim B + \sim C + D*E)$
- d) $\sim((A*\sim B + \sim C) + (D*E))$

5) Minimize the following primitive expressions. Are there any logically redundant prime implicants?

$$(A\sim B\sim C) + (A\sim BC) + (\sim A\sim B\sim C) + (\sim AB\sim C).$$

$$\sim B\sim C + A\sim B + \sim AB\sim C$$