CS 210 Homework 5

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Consider the Boolean expression $e = (x + z)' + (x + y)'z + xy'z$.

1. Produce the Boolean expression equivalent to e in canonical sum of minterms form.

2. Give a Karnaugh map for e and show the minimal set of prime implicants that cover e and the minimal set of prime implicants that cover e'.

3. Produce a Boolean expression equivalent to e in each of the following standard forms:

   (a) Minimum-literal sum of products
   (b) Minimum-literal product of sums
   (c) Minimum-literal inverted sum of products
   (d) Minimum-literal inverted product of sums

4. Construct a circuit that implements e using each of the following two-level circuit constructions:

   (a) NAND-NAND
   (b) NOR-NOR
   (c) NAND-AND
   (d) NOR-OR