Boolean Functions

1. Summary
   - Dichotom vs. Non-dichotom

2. Q&A

3. Problems

Aim:
- Week 5, Problems due date
- Website video (2012 class) has better

Def. Inf\(_d\) [f] = Shaliz D.F. \[ I_{\text{df}} = \sum_{i=1}^{2^n} \text{Inf} \] then f: \{-1, 1\} → R, Var [f] ≤ 1

Let \( \Phi \) be set of predicates over \( \Omega = \{-1, 1\} \)

Let \( 0 < \alpha < \beta < 1 \)

Load tester for f

- Pr Error accepts f if \( \beta \) if f is a dichotom

- Tester uses predicates from \( \mathcal{F} \)

If \( \alpha \) is larger, \( \alpha \) is smaller

- Tester uses predicates from \( \mathcal{F} \)

If \( f \) has no \( (\varepsilon, \varepsilon) \) relative coordinates

Prob. \( I_{\text{df}} [f] \leq \frac{1}{\varepsilon} \)

If \( J = \emptyset \), f is quasirandom

- \( \mathcal{F} \) is a set of functions

Then, if there exists a \( \delta > 0 \) such that

\( |\mathcal{F}| \geq \delta \), then exists

a \( (\varepsilon, \varepsilon) \)-test using OR

\( V \alpha \leq |\mathcal{F}| \leq \frac{1}{\varepsilon} \rightarrow \mathcal{F} \) test using OR

\( V \alpha \leq |\mathcal{F}| \leq \frac{1}{\varepsilon} \rightarrow \mathcal{F} \) test using linear equations

Test: choose \( x, y \) independently from \( \mathcal{F} \)

- There is a subexponential time for UC

- A lot of cases

- The pattern is NP-hard

- Linear

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Accept if \( f(x) \wedge f(y) \wedge f(\overline{x}) \neq 0 \)

Accept if \( f(x) \wedge f(y) \wedge f(\overline{x}) = 1 \)