

Evasiveness of Boolean Functions

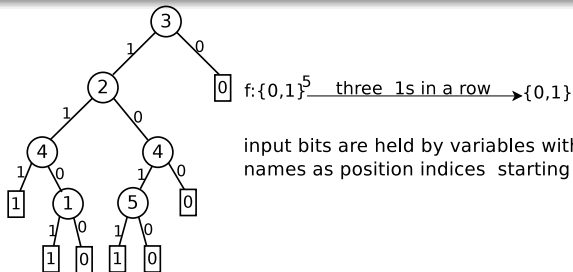
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Background knowledge

Decision Tree: A simple model for representing Boolean Functions.

- A strictly binary tree
- Each internal node is labeled with some x_i and has two outgoing edges labeled 0 and 1 (called 1-edge and 0-edge respectively)
- Leafs are labeled either 0 or 1
- The length of the longest path (in terms of number of edges) in the decision tree is called Decision Tree Complexity of the function which the tree represents (Depth of the Decision Tree)



- Computation of $f(x)$ on input $x = x_1, x_2, \dots, x_n$ involves inspecting the input bit x_i indicated by the node's label (starting from root)
- If $x_i = 1$ computation continues on subtree reached by taking 1-edge, otherwise on subtree reached by taking 0-edge
- Input x follows a path in the tree and the leaf at which the path terminates, gives the value $f(x)$

Evasiveness Property of Boolean Functions

Starting to contribute to a project earlier is the natural way to enter GSOC. In that sense this is a long term commitment

- Choose simplest one
- Each of the organizations have project ideas page
- You can propose your own

$F^{-1}(1) = \{x | F(x) = 1\}$ $F^{-1}(0) = \{x | F(x) = 0\}$ If $|F^{-1}(0)|$ is odd, then F is evasive 2^{n-d} The string property *at least k 1s* is evasive if and only if $1 \leq k \leq n$.

$$\sum_{x \in F^{-1}(0)} (-1)^{\#1(x)} = 0 \quad (1)$$

Outline
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Learning the project
Preparing application
Evaluation process
Potential organizations

Preparing Application

Evaluation process

- Varies among organizations

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- An example: Etherboot exercise

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- Some common evaluation criteria

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- An example: Etherboot exercise
- Some common evaluation criteria
 - Technical ability
 - Clarity and quality of proposal
 - Communication ability
 - Interaction with mentors and other community members
 - Understanding of codebase and toolchain

Potential organizations

- Debian
- LLVM
- Etherboot
- kde
- GNOME
- SMC

Do your work now...
Show commitment...
Rest will follow..