



Project - Tabular Method

The goal of this assignment is to develop a software implementation of the Quine and McCluskey tabular method.

Specifications

1. **Inputs:** Your program should accept the following inputs (see the sample test cases below):
 - a. The number of variables
 - b. The number of minterms
 - c. The values of minterms
2. **Outputs:**
 - a. Prime implicants
 - b. Essential prime implicants
 - c. The minimum sum-of-products representation of the input function.
When there are multiple solutions, only one solution is sufficient.
3. **Minimization Steps:** Printing the steps of the tabular method and minimization in a readable format is recommended, but not required. The output trace can help while debugging and also during the grading process if there are errors.
4. **Cost of complemented variables:** In the minimization step, you can assume that the cost of inverters is zero.
5. **Programming language:** You have to choose any programming language

Notes:

1. Test your code under different scenarios, not only the sample runs below.
2. In Lectures, two different ways were discussed to do the tabular method. One of the methods used the binary representation, and the other used the decimal representation of minterms. You are not required to follow a certain representation. You can choose the method that would make your implementation easier. (You can also modify the representation or combine different representations, as long as the procedure is eventually done correctly).
The same applies to the prime implicant chart.
3. Use the letters A, B, C, .. for the variable names. Use ' to indicate inversion.
4. Handling the incompletely-specified functions case is not required.

Sample Runs (Console I/O):

Sample Case 1:

```
Enter number of variables: 4
Enter number of minterms: 8
Enter minterms: 1 3 5 7 8 10 13 15

Number of Prime Implicants: 3
Prime Implicants: AB'D', A'D, BD
Number of Essential Prime Implicants: 3
Essential Prime Implicants: AB'D', A'D, BD

Result: f = A'D + BD + AB'D'
```

Sample Case 2:

```
Enter number of variables: 3
Enter number of minterms: 6
Enter minterms: 0 1 2 5 6 7

Number of Prime Implicants: 6
Prime Implicants: A'B', A'C', B'C, BC', AC, AB
Number of Essential Prime Implicants: 0
Essential Prime Implicants:

Result: f = A'B'+ BC'+ AC
```

Deliverables

You should deliver a zip file that contains:

1. The source code of your program.
2. A report that briefly describes your implementation and highlights the main details of your design. The report should also include sample runs and output traces. The report should be submitted as a PDF file.

Policies

- You have to work in group of 5
- If 2 or more copies are discovered, all copies will lose submission marks and will be given a penalty of 100% of submission marks, i.e., lose additional points. Hence, it is better to deliver nothing than delivering a copy.
- No late submission is allowed.