University of Guelma

Computer Science Department | **1st-year Computer Science Engineer**
Module: Machine Structure | **Academic year: 2024/2025**

Serie of Tutorial Works N° 3

Exercise 01:

Simplify the following logic functions:

F1= A $\overline{B}$ $\overline{C}$+ A B C+ $\overline{A}\overline{B}$C+ $\overline{A}$ B $\overline{C}$

F2=(A+$\overline{B}$) (A$\overline{B}$+C) C

F3=$\overline{A\overline{B}+AC}$+A$\overline{B}\overline{C}$

Exercise 02:

Let's consider the following two functions:

F1=(a+b) (ab+c) (a $\overline{c}$ +$\overline{b}$)

F2=(a+b)($\overline{a}$+c)($\overline{a}$ + $\overline{b}$)

1. Simplify each one of the above functions.
2. Draw the logic diagram associated with each simplified function.

Exercise 03:

Simplify the following logic functions using the Karnaugh map:

F1(A,B,C)=($\overline{A}$+B) (A+$\overline{B}$+$\overline{C}$) (A+C)

F2(A,B,C,D)=$\overline{A}\overline{B}$D +$\overline{A}$CD+A$\overline{C}$D

F3(A,B,C,D)= $\sum$(0,1,4,5,6,7,8,9,13,14,15)

F4(A,B,C,D,E)= $\sum$(0,1,2,3,4,5,6,9,10,11, 12, 13, 16, 17, 18, 19, 20, 21, 22, 25, 26, 27, 28, 29)

Supplementary exercise:

Exercise 04:

Simplify the following logic functions using the Karnaugh map:

F1(A,B,C,D)= $\sum$(3,,5,6,7,8,9,11,12,13,14,15)

F2(A,B,C)=$\overline{A}\overline{B}\overline{C}\overline{D}$ +$\overline{A}\overline{B}\overline{C}\overline{D}$+A$\overline{B}\overline{D}$+AB$\overline{C}\overline{D}$+ABC$\overline{D}$

F3(A,B,C)=A$\overline{B}$C+AB$\overline{C}$+ABC

F4(A,B,C,D)=B$\overline{C}\overline{D}$+$\overline{A}$B$\overline{D}$+ABC$\overline{D}$

F5(A,B,C,D)=$\overline{A}$+AB+A$\overline{B}$C+A$\overline{B}$CD