ECSE 323 — Group 47 Lab 4 Report Permutation

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1 Permutation

The permutation is used encript and revert to the original message. To do so, we were given a table which depics the character encription list given in the figure 1. There are 4 configuration we are given to be made. To make the permutation circuit, we need 2 input and 2 outputs. The inputs will receive a 2 bit rotor_type giving which type of encription that must be done and the second input inputs a 5 bit input_code that must be encripted. The outputs are a 5 bit output_code which outputs the encripted version of the input bits determined by the rotery position and the second input is the inv_output_code giving out the inverted or decripted 5 bit code. This is given by the figure 2. We tested out vhdl code on the ModelSim and got what we were expected to get from the permutation graph

INPUT	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
Rotor I	E	K	M	F	L	G	D	Q	V	Z	N	T	O	W	Y	H	X	U	S	P	A	I	B	R	C	J
Rotor II	A	J	D	K	S	I	R	U	X	B	L	H	W	T	M	C	Q	G	Z	N	P	Y	F	V	O	E
Rotor III	B	D	F	H	J	L	C	P	R	T	X	V	Z	N	Y	E	I	W	G	A	K	M	U	S	Q	O
Rotor IV	E	S	O	V	P	Z	J	A	Y	Q	U	I	R	H	X	L	N	F	T	G	K	D	C	M	W	B

Figure 1: Permutation graph.

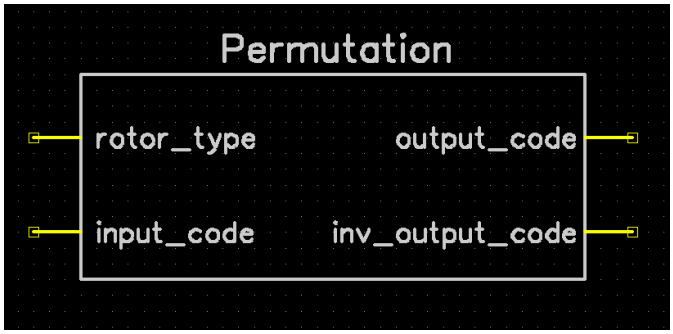

Figure 2: Permutation symbol.

as you can see from the figures 3, 4, 5, 6, and 7.

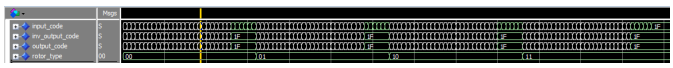

Figure 3: Tested circuit on ModelSim

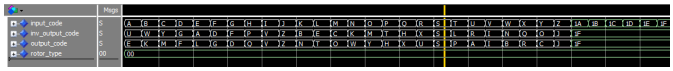

Figure 4: With rotor I.

Figure 5: With rotor II.

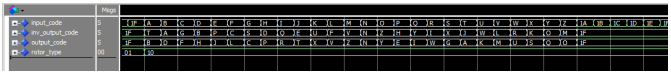

Figure 6: With rotor III.

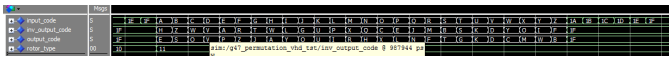

Figure 7: With rotor V.