8-BIT FLOATING POINT DIVIDER

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Objective :

Two floating point numbers to be divided are given as inputs in IEEE 754 format. Division is done and delivered out in IEEE 754 format.

Abstract Idea :

For giving an input in IEEE format refer the below chart.The division is done using iterative method.

Chart for Converting Binary to 8-bit IEEE 754 :

S E1 E2 E3 F3 F2 F1 F0

EXPONENT	C15	C14	C13	C12	C11	C10	C9	C8	.	C7	C6	C5	C4	C3	C2	C1	C0
0 0 0	0	0	0	0	0	0	0	0		0	0	F3	F2	F1	F0	0	0
0 0 1	0	0	0	0	0	0	0	0		0	1	F3	F2	F1	F0	0	0
0 1 0	0	0	0	0	0	0	0	0		1	F3	F2	F1	F0	0	0	0
0 1 1	0	0	0	0	0	0	0	1		F3	F2	F1	F0	0	0	0	0
1 0 0	0	0	0	0	0	0	1	F3		F2	F1	F0	0	0	0	0	0
1 0 1	0	0	0	0	0	1	F3	F2		F1	F0	0	0	0	0	0	0
1 1 0	0	0	0	0	1	F3	F2	F1		F0	0	0	0	0	0	0	0
1 1 0	0	0	0	1	F3	F2	F1	F0		0	0	0	0	0	0	0	0

Figure 1: (S1 E1 E2 E3 F3 F2 F1 F0) is in IEEE format

VHDL Code :

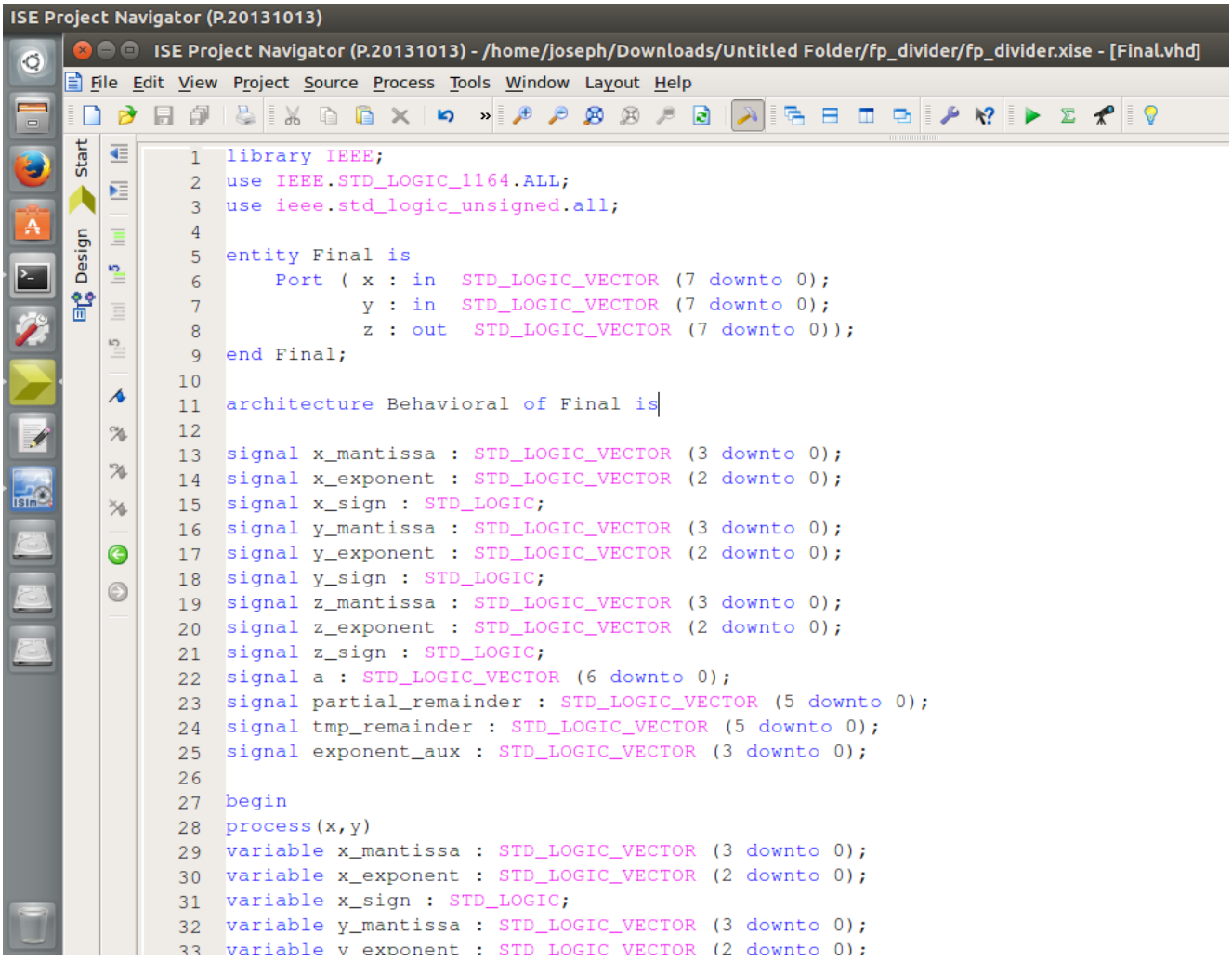

Figure 2: Initializing the inputs, outputs and intermediate signals

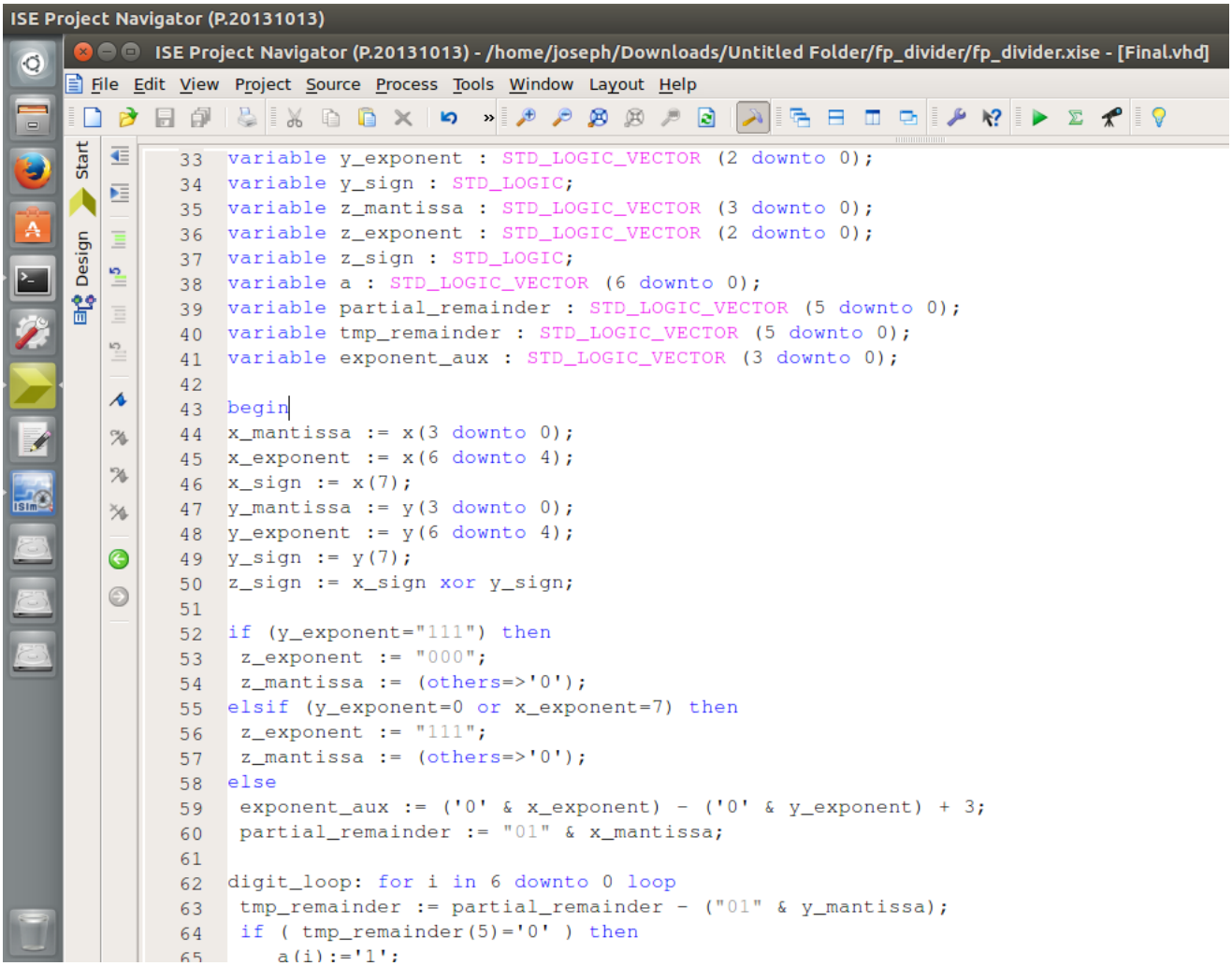

Figure 3: Checking for special cases..

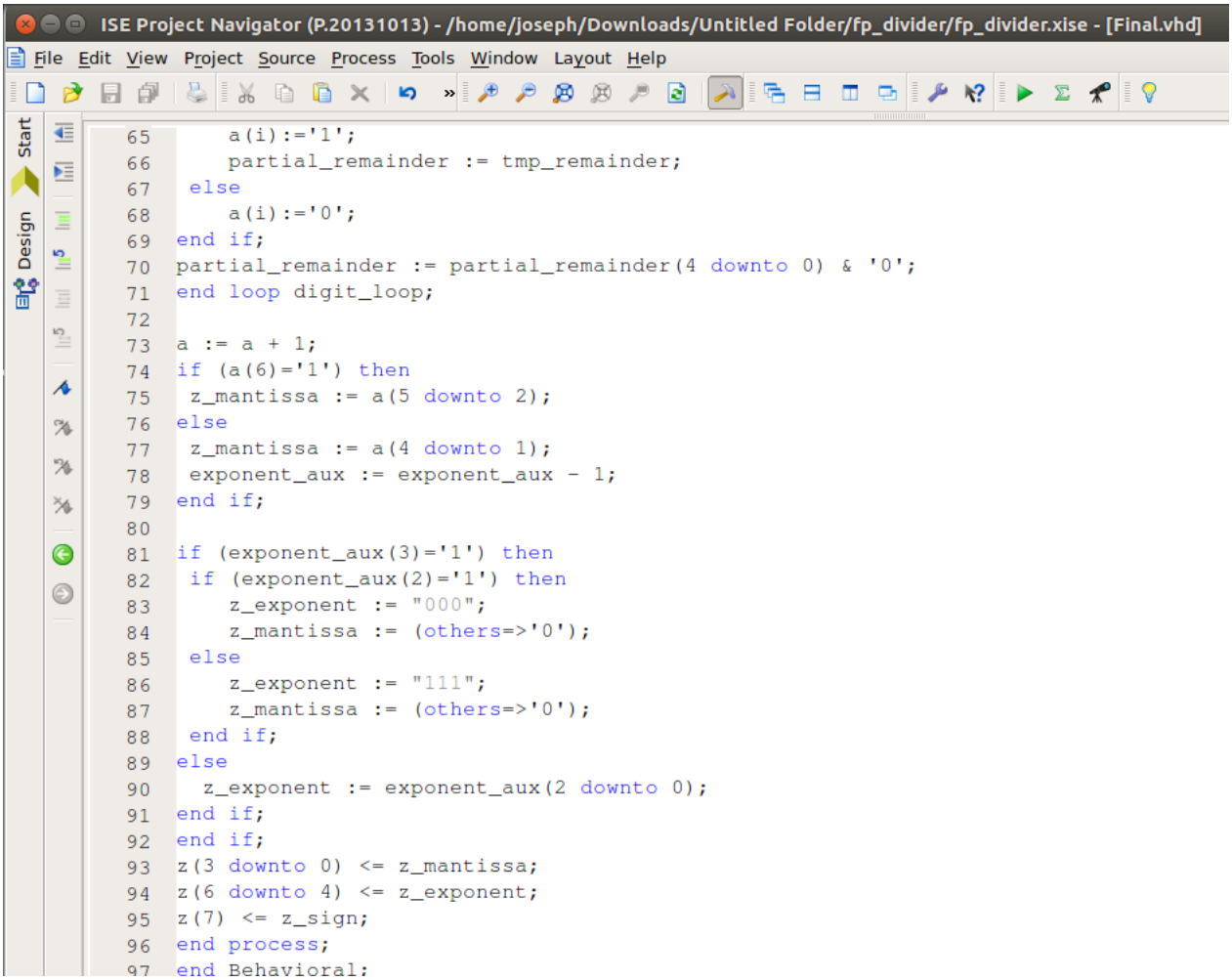

Figure 4: Key lines of the code for Division...

Design Summary :

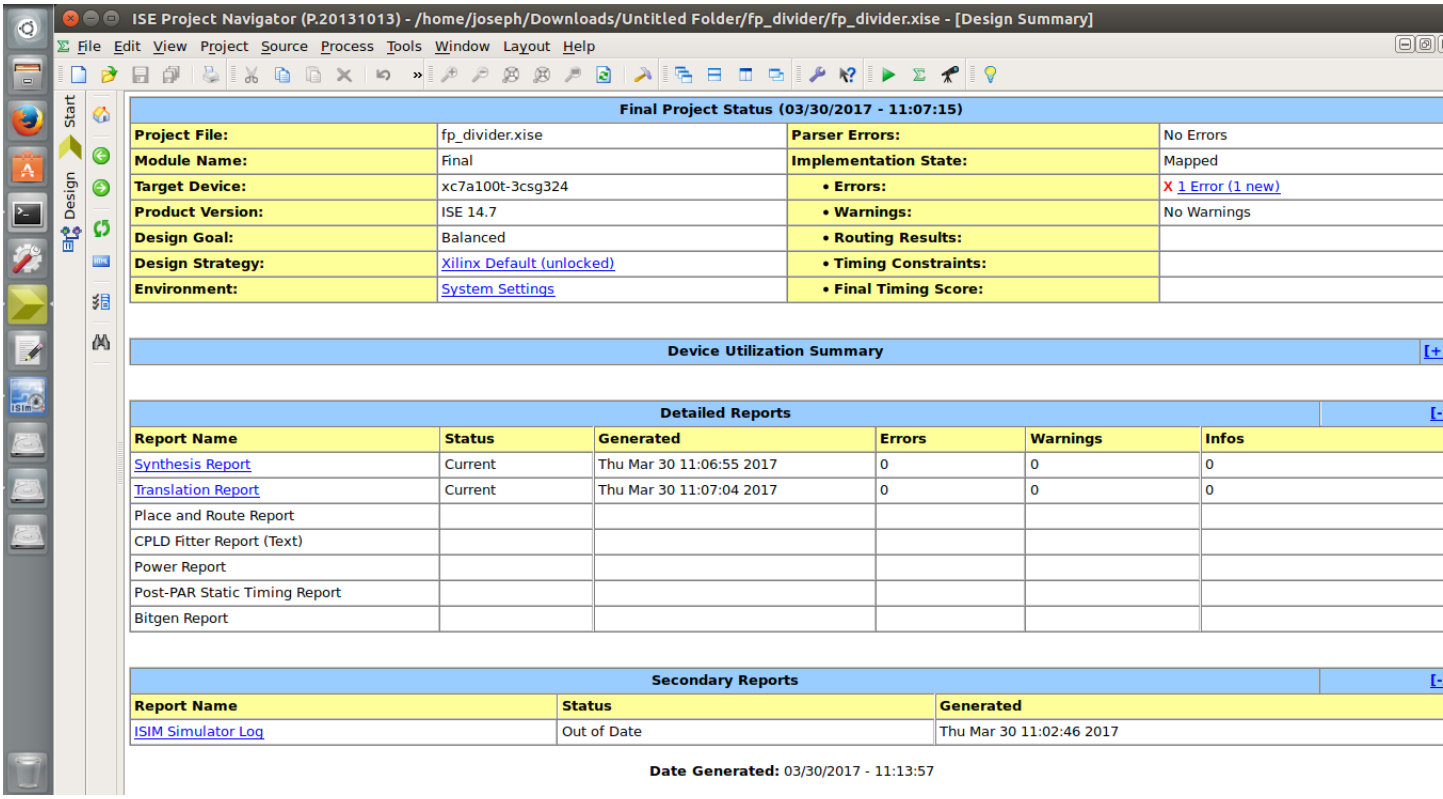

Figure 5: Final report of the design

Simulation Report :

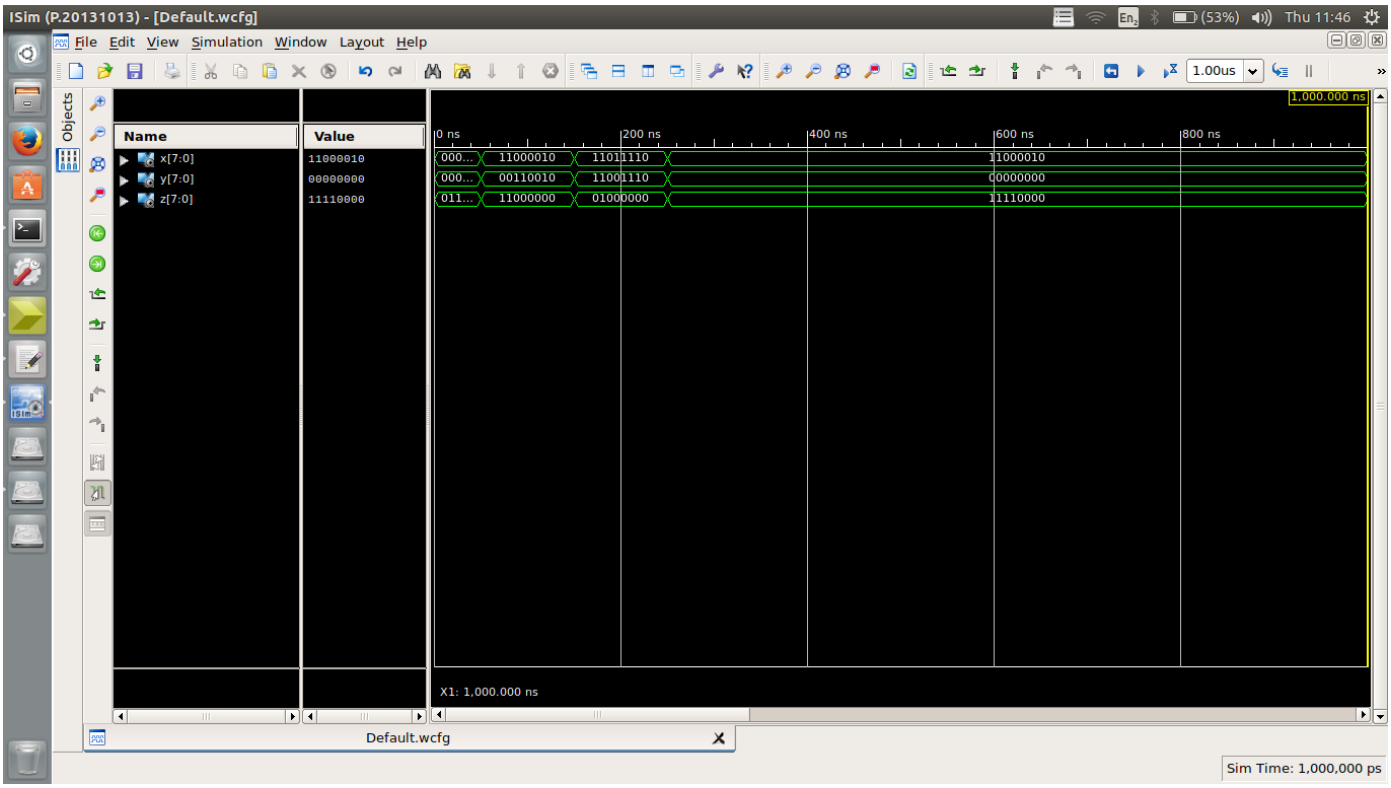

Figure 6: Sample inputs and outputs in signal form

References :

1 edaboard:

http://www.edaboard.com/forum.php

2 VHDLguru:

http://vhdlguru.blogspot.in/

3 WIKIPEDIA:

https://en.wikipedia.org/wiki/IEEE$_{f}loating_{p}oint$

4 Others:

http://class.ece.iastate.edu/arun/CprE281$_{F}$05/$ieee$754/ie5.$html$