AWAD, Abdelkarim, GHANEM, Wasel, *COMPUTER ORGANIZATION: HARDWARE DESCRIPTION LANGUAGE APPROACH*

Abstract: Teaching of computer organization and architecture concepts is not an easy task for instructors. Usually, Students face difficulties in grasping many (even simple) ideas. In this paper we will present a stereotype of using Computer Aided Design CAD tools, namely, Altera's Quartus II simulator, in teaching Computer Organization concepts. We will build a simple computer using verilog HDL language. We will elaborate on the Instruction Set Architecture (ISA) concepts. In our approach we will provide students with a running simple computer, which will make the simulation possible and easy. This way, they can trace the execution of the simple computer that has few instructions stored in the memory. After that students can route the program on a FPGA which is important because it will teach them how to build their own processor. At the end, students can expand the computer in several dimensions (e.g. more instructions, more addressing modes, cache, speculative execution, little or big Endian,…). We present at the end of this paper a typical exercise that can help students to improve their knowledge about the computer organization. As a future work we introduced Moodle as a good candidate to be used in the e-learning process.