# 1. INTRODUCTION

A Hardware Description Language (HDL) is a specialized computer language used to describe the structure and behavior of digital logic circuits. It allows for the synthesis of a HDL into a netlist, which can then be synthesized, placed and routed to produce the set of masks used to create an integrated circuit.

# 2. PROJECTS

.1. module_definitions
.1.1. module_items
.1.1.1. data_type_declarations
.1.1.2. module_instances
.1.1.3. primitive_instances
.1.1.4. generate_blocks
.1.1.5. procedural_blocks
.1.1.6. continuous_assignments
.1.1.7. task_definitions
.1.1.8. function_definitions
.1.1.9. specify_blocks
.1.2. port_declarations
.2. data_type_declarations
.2.1. net_data_types
.2.2. variable_data_types
.2.3. other_data_types
.2.4. vector_bit_selects_and_part_selects
.2.5. array_selects
.2.6. reading_and_writing_arrays
.3. module_instances
.4. primitive_instances
.5. generate_blocks
.6. procedural_blocks
.6.1. procedural_time_controls
.6.2. sensitivity_lists
.6.3. procedural_assignment_statements (=continuous_assignments)
.6.4. procedural_programming_statements
.6.4.1. if_part
.6.4.2. case_part
.6.4.3. casex_part
.6.4.4. casez_part
.6.4.5. for_part
.6.4.6. while_part
.6.4.7. repeat_part
.6.4.8. forever_part

.6.4.9. disable_part
.7. continuous_assignments
.8. operators
.9. task_definitions
.10. function_definitions
.11. specify_blocks
.11.1. pin_to_pin_path_delays
.11.2. path_pulse_detection
.11.3. timing_constraint_checks
.12. user_defined_primitives
.13. common_system_tasks_and_functions
.14. common_compiler_directives
.15. configurations
.16. synthesis_supported_constructs

# 3. WORKFLOW

```
source INSTALL-IT

cd test
source TEST-MSP430-IT
source TEST-RISCV-IT
```

# 4. CONCLUSION

## 4.1. FOR WINDOWS USERS!

1. Settings → Apps → Apps & features → Related settings, Programs and Features → Turn Windows features on or off → Windows Subsystem for Linux
2. Microsoft Store → INSTALL UBUNTU

Library type:

```
sudo apt update
sudo apt upgrade

sudo apt install bison cmake flex freeglut3-dev libcairo2-dev libgsl-dev \
libncurses-dev libx11-dev m4 python-tk python3-tk swig tcl tcl-dev tk-dev tcsh
```

#### 4.1.1. Front-End

type:

```
sudo apt install verilator
sudo apt install iverilog
sudo apt install ghdl

cd /mnt/c/../sim/verilog/regression/wb/iverilog
source SIMULATE-IT

sudo apt install yosys

cd /mnt/c/../synthesis/yosys
source SYNTHESIZE-IT
```

#### 4.1.2. Back-End

type:

```
mkdir qflow
cd qflow

git clone https://github.com/RTimothyEdwards/magic
git clone https://github.com/rubund/graywolf
git clone https://github.com/The-OpenROAD-Project/OpenSTA
git clone https://github.com/RTimothyEdwards/qrouter
git clone https://github.com/RTimothyEdwards/irsim
git clone https://github.com/RTimothyEdwards/netgen
git clone https://github.com/RTimothyEdwards/qflow

cd /mnt/c/../synthesis/qflow
source FLOW-IT
```