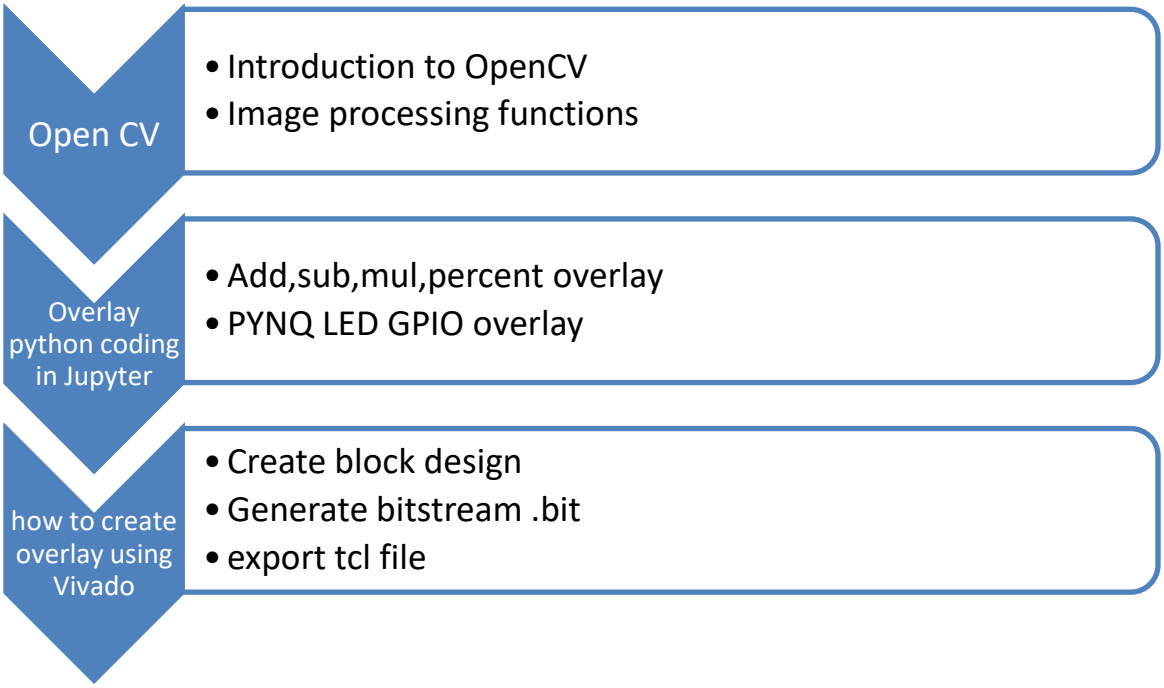
Laboratory on vivado using PYNQ FPGA

Flow of Laboratory:



Install Angry IP scanner to know IP: https://angryip.org/download/#windows

PYNQ Jupyter

User name: xilinx

Password: xilinx

Copy files in pynq board from github use command “git clone link of github”

GitHub:https://github.com/UMONSMicroelectronics

Mail ID: patelmonalumons@gmail.com

Steps for creating Overlay in VIVADO

Note: To see Device PYNQ in tools, download zip folder from given link and put in VIVADO >Board parts

https://github.com/cathalmccabe/pynq-z1_board_files

Tutorial:

https://pynq.readthedocs.io/en/v2.5.1/overlay_design_methodology/overlay_tutorial.html

https://discuss.pynq.io/t/tutorial-creating-a-hardware-design-for-pynq/145

Step 1: Open **vivado HLS** 2020.1 or 2018.2 (**Note:** Version for vivado is important)

Step 2: Create new project>project configuration>add files>device selection (PYNQ Board)

Step 3: Put C coding of IP in .cpp file it's in Source >save file>run C Synthesis >generated synthesis report

Step 4: Export RTL

Step 5: Make note of register offsets , check in Solution 1>impl>misc>drivers>add v1>src>hw.h file

Step 6: Open **VIVADO** 2020.1 or 2018.2

Step 7: create new project>project name>project type>device selection>finish

Step 8: click on Create block Design >add ip using (+) ZYNQ Processing >run block automatic

Step9: Add IP of adder or… go to tools>setting>IP>repository>add files which we created using vivado hls(created IP)

Step 10: add ip of adder or….> in block property change name i.e scalar_add>run block automatic

Step 11: Source >design1 right click **>**create HDL Wrapper

Step12: Generate bit stream

Step13: Generate TCL File >go to file>export>export block design

Step 14: Upload. bit and .tcl file in PYNQ Board and check overlay using python

Lab.1

Latest version of PYNQ Manual:

https://buildmedia.readthedocs.org/media/pdf/pynq/latest/pynq.pdf

PYNQ Board reference Manual:

https://reference.digilentinc.com/_media/reference/programmable-logic/pynq-z1/pynq-rm.pdf

Downloadable PYNQ Image:

http://www.pynq.io/board.html

PYNQ Tutorial :

https://github.com/Xilinx/PYNQ_Workshop

Overlay Create Tutorial

https://pynq.readthedocs.io/en/v2.5.1/overlay_design_methodology/overlay_tutorial.html

https://discuss.pynq.io/t/tutorial-creating-a-hardware-design-for-pynq/145