# FPGA Pin Assignment

- FPGA pins can be assigned using the Pin Planner

or

- FPGA pins can be assigned by importing a pin assignment file from the web page
  - DE10_Lite.qsf

  - download the file from the website and save it to a central location so that you can easily import it each time you create a new project
  - select save as, change the file types to all files, and make sure the file name extension is .qsf and not .txt

# FPGA Pin Assignment

- ## Design Entry
  - ### Pin Assignments
    - Assignments -> Import Assignments
    - Point to the DE10_Lite.qsf file

    - This has all pins in it
      and will generate
      warnings later on for
      each unused pin

    - You can copy and
      modify the file to
      remove the warnings
      by removing unused
      pins

```
DE10_Lite.qsf - Notepad
File  Edit  Format  View  Help
#==========================================================
# Altera DE10-Lite board settings
#==========================================================


set_global_assignment -name FAMILY "MAX 10 FPGA"
set_global_assignment -name DEVICE 10M50DAF484C7G
set_global_assignment -name TOP_LEVEL_ENTITY "DE10_Lite"
set_global_assignment -name DEVICE_FILTER_PACKAGE FBGA
set_global_assignment -name SDC_FILE DE10_Lite.sdc
set_global_assignment -name INTERNAL_FLASH_UPDATE_MODE "SINGLE IMAGE WITH ERAM"


#==========================================================
# CLOCK
#==========================================================
set_instance_assignment -name IO_STANDARD "3.3-V LVTTL" -to CLOCK_50
set_instance_assignment -name IO_STANDARD "3.3-V LVTTL" -to CLOCK2_50
set_instance_assignment -name IO_STANDARD "3.3-V LVTTL" -to CLOCK_ADC_10
set_location_assignment PIN_P11 -to CLOCK_50
set_location_assignment PIN_N14 -to CLOCK2_50
set_location_assignment PIN_N5 -to CLOCK_ADC_10


#==========================================================
# Arduino
#==========================================================
set_instance_assignment -name IO_STANDARD "3.3-V LVTTL" -to ARDUINO_IO[0]
set_instance_assignment -name IO_STANDARD "3.3-V LVTTL" -to ARDUINO_IO[1]
set_instance_assignment -name IO_STANDARD "3.3-V LVTTL" -to ARDUINO_IO[2]
set_instance_assignment -name IO_STANDARD "3.3-V LVTTL" -to ARDUINO_IO[3]
set_instance_assignment -name IO_STANDARD "3.3-V LVTTL" -to ARDUINO_IO[4]
set_instance_assignment -name IO_STANDARD "3.3-V LVTTL" -to ARDUINO_IO[5]
set_instance_assignment -name IO_STANDARD "3.3-V LVTTL" -to ARDUINO_IO[6]
set_instance_assignment -name IO_STANDARD "3.3-V LVTTL" -to ARDUINO_IO[7]
```

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- Note on pin names

  For example:

  - In the qsf file and most documentation the toggle switches are called SW[9] to SW[0] or SW9 to SW0

  - Since VHDL uses parentheses rather than square brackets, these switches are referred to as SW(9) to SW(0) in the HDL or bdf files.

  - They can also be referred to as an array SW(9 downto 0).