Digital Logic Design
Group number 19
Batch 1:Walking Stick

  The aim of the project was to create a stick to help out blind people to easily navigate through a place.The stick is intended to vibrate whenever an obstacle appears in front of the stick and produce a sound when the stick appears to not be touched by the user(fell off).

Components used :
- 5 v Buzzer to produce the sound
- Capacitive Touch Sensor(2V to 5.5V Supply) to detect if the stick is still in the hands of the user
- 3.3 v vibrate motor to produce the vibration motion when an obstacle appears
- 5 v proximity sensor to sense if any object is in the user's path

Code implementation :
  The walking stick was implemented using 3 inputs:
1. Enable(en) which turns on/off the stick.If the enable was off the outputs of the buzzer and the vibrate motor is always zero no matter what the sensors' readings are.If the enable was turned on the the outputs of the buzzer and the vibrate motor is dependent on the readings' of the sensors.
2. Touch which is the reading of the touch sensor.The touch sensor reads 1 if it's activated and 0 if it's not activated.The input of the touch sensor was connected to 5v from the fpga and output to a GPIO pin.
3. Obstacle which is the reading of the proximity sensor,which reads 0 if an object is detected and 1 if there is no object detected.The input of the proximity sensor was connected to 5v from the fpga and output to a GPIO pin

 The walking stick was implemented using 2 outputs:
1. Sound is the output coming from the buzzer.The output is 1 when the touch sensor is not activated and the enable is on (1) .
   sound<= Not touch;
2. Vibrate(vibr) is the output coming from the vibrate motor.The output is 1 when the proximity sensor detects an object and the enable is on.
   vibr<= Not obstcale;

Pin Assignment :
 En pin C10 (switch on the fpga board)
 Obstacle pin AA2 (GPIO) which is the output of the proximity sensor

Sound pin W5 (GPIO) positive of buzzer
Touch pin AA15 (GPIO) output of the touch sensor
Vibr pin AB2 (GPIO) positive of the vibrate motor