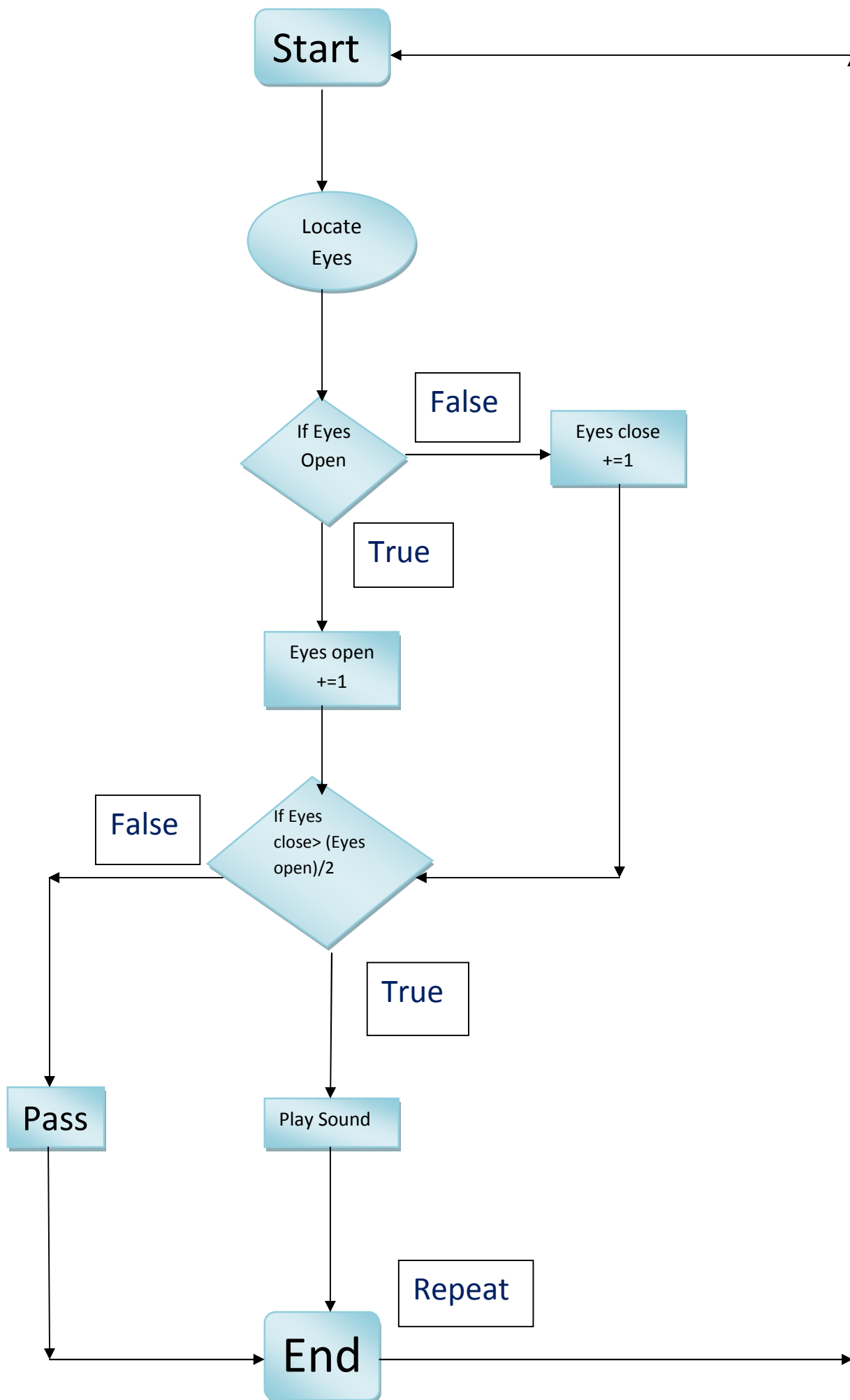# Drowsiness Detector

Life at school is rapidly changing with change in technology. A number of tools have been developed for students' all over development. To add to such great tools, another tool can be the drowsiness detector.

Introduction

The Drowsiness Detector is a tool which can help the students keep awake and concentrate in a class. The tool keeps an eye over the students' drowsiness and whenever a student tries or feels sleeps, it starts blowing a horn sound. The sound is strong enough to wake up the student and help him/her concentrate. It works with an accuracy of about 95% and can be greatly used to make the class environment better.

Structure

The Drowsiness Detector is designed in OpenCV and Python programming. It works on simple logic and the flowchart is as follows.

```
                    Start ◄─────────────────────────────┐
                      │                                  │
                      ▼                                  │
                 ┌─────────┐                             │
                │  Locate   │                            │
                │   Eyes    │                            │
                 └─────────┘                             │
                      │                                  │
                      ▼                                  │
                                  False                  │
                   ◇ If Eyes ◇ ──────────►  ┌──────────┐ │
                    Open                     │ Eyes close│ │
                      │                      │   +=1     │ │
                      │ True                 └──────────┘ │
                      ▼                           │       │
                ┌──────────┐                      │       │
                │ Eyes open │                     │       │
                │   +=1     │                     │       │
                └──────────┘                      │       │
                      │                           │       │
                      ▼                           │       │
     False   ◇ If Eyes                ◇ ◄─────────┘       │
      ◄────── close> (Eyes                                │
              open)/2                                     │
      │             │                                     │
      │             │ True                                │
      ▼             ▼                                     │
  ┌──────┐     ┌──────────┐                               │
  │ Pass │     │Play Sound│        Repeat                 │
  └──────┘     └──────────┘                               │
      │             │                                     │
      │             ▼                                     │
      └────────► End ────────────────────────────────────┘
```

It goes as simple as it looks. The webcam first locates the eyes. Basically, it makes an analysis on data for every five seconds. For every time the eyes are found closed, it adds one to a variable set only for case when eyes are closed, else it adds one to another variable set especially for case when eyes are open. If the result, i.e., the variable Eyes close> (Eyes open)/2, the program or the model blows a horn sound, thus yielding its result, but is the variable Eyes close< (Eyes open)/2, it passes the result to the end thus not producing its horn sound.

Using the model

The model can easily be used by installing the 32-bit versions of 'OpenCV (3.0.0)' from 'http://opencv.org/', 'Python (2.7)' from 'https://www.python.org/' and 'numpy (1.10)'from 'https://sourceforge.net/projects/numpy/'. The link for the code is as follows.

'https://drive.google.com/drive/folders/0B-ynbis3wVV2cUlram1kRHRyRVE?usp=sharing'

"It has already been shared."

Download all these things and the model will be ready on your computer. Start the IDLE and the code works. It does not work when glasses are on the eyes. I am still working on this problem. It is still under research to find a solution to it.

Hope you will like the project.

BY- ANSH ARORA

E-MAIL- ansh7xpex@gmail.com

For- IIT-Delhi, Rendezvous CodeWars(2016)