//Codename Frostbyte//

Following document focuses on the following aspects of the product:

1. Cost and effective cost per head
2. About the product
3. Important advantages of the product
4. Basic mechanism and code for the project
5. Important duties of members

Postulates:

- People who cannot be a part of the project shall report this to the team thus giving time for some effective decisions.
- Everyone should read the document thoroughly and report errors and amendments.
- First product is decided to be a **Sound Level Meter** calibrated in db.
- There should be clarity about the objective of the team and its goals and no miscommunication. If you want to correct something or you object something, please communicate with the team through Whatsapp, Facebook, Etc.
- Everyone should bring 180rs on Tuesday or else they will be roasted badly.

Cost and Effective Cost per Head

- Total cost of Arduino kit + Sound sensor is **rs923.**
- As of 16th Feb. 2018, the group has 5 members- Manas J, Manas S, Bodhisattva T, Aditya S, Aditya A. Hence the total cost will be split into 5- Rs184.6.
- The cost of hiring Auto, Ola, Uber, Bus, Train, Airplane, etc. will not be reimbursed by the Group, it is totally personal and the members should have to afford it indivisually.

About the product

- Our product is a Sound Level Meter calibrated in db that can display results on a computer monitor.
- The product is aimed at classrooms and places where sound levels have to be regulated.
- Our total cost price of product is 923rs and we will add a markup of 77rs and sell it at 1000rs.
- The idea for the product is totally original along with the code behind it.
- We can make an updated version once we have increased capital for the product - we can add an 0led screen, we can add a bunch of other sensors along with a bluetooth shield so that the results and the data accumulated from the sensors be viewed in an android app which we will build(all original)

➢ Important Advantages of the product:

Our product will reduce the pressure on the upper authorities of an institution like a School where important people have increasing number of work to do, we can keep people like the headmistress at ease with this. Other places where audio levels are regulated and need to be controlled. It can be used by the Government to maintain audio levels and considerably reduce noise pollution which will benefit both- Animals and Man. Many other instances can be imagined where one would need a sound sensor.

➢ Basic Mechanism and code behind the product

- Our product consists of an Arduino setup containing Sensitive Sound sensors/graphite microphone.
- The product takes AC signals from the surrounding in every 50ms and calculates if it reaches the maximum AC limit and produces considerable values corresponding to the db scale.
- Basically, sound from surrounding is not measured, what's measured is how much the membrane moves, the sensor sends this info to the microprocessor where is performs calculations and converts the analog signals to decibel values. The code is made to run on a loop so that it continuously takes sounds from the surrounding and sends it to the Arduino, in the end the result gets displayed on the screen.

Following is the code written in Arduino IDE(credit- ManasJ)

```
/* arduino sound meter developed by Frostbyte*/

const int sampleWindow = 50;
unsigned int sample;
void setup() {
  Serial.begin(9600);
}

void loop() {
  unsigned long startMillis= millis();
  unsigned int peaktopeak= 0;

  unsigned int signalMax = 0;
  unsigned int signalMin = 1024;

  while (millis() - startMillis < sampleWindow){
   sample = analogRead(0);
   if(sample < 1024)
   {
     if (sample > signalMax)
     {
       signalMax = sample;
     }
     else if (sample < signalMin)
     {
      signalMin = sample;

     }
   }
  }
  peaktopeak = signalMax - signalMin;
  double volts = ((peaktopeak * 3.3)/ 1024) * 0.707;
  double firstvalue = log10(volts/0.00631)*20;
  double secondvalue = firstvalue + 94 - 44 -25;
   Serial.println(secondvalue);
```

}

Important Duties of Members:

Following are the names and duties for the members for Science Exhibition On 26th February:

1. Manas Sharma: He has decent English speaking skills and leadership skills and he can be beneficial as he can build a pretty great Analog product. So He should handle the team making Analog product. (Note that we want the analog product by 25th Feb).
2. Bodhisattva Talukdar: He too has decent English speaking skills (probably best the group (but he sucks at life)) and has good technical knowledge and should lead the Sound Level Meter product.
3. Aditya Sinha: He has decent English speaking skills but cannot face an audience for longer durations (he tends to get nervous and fumbles), he can lead the team for the Sound Level Meter or can assist Bodhi in it. He also knows basic coding and Arduino coding so he can take care of bugs in the code and the Arduino (Though the code is bug free) so he can handle the backend for the Sound Level Meter.
4. Aditya Arora: He has good technical knowledge and communication skills and he can switch between the two groups or can join the Analog team.
5. Manas Jha: Well he practically wont exist there to assist the team and has no duty for the Science Exhibition.

//Best_of_Luck_Team//