1. Title	***Caught You !!!***
2. Team Name	***Tech Odyssey*** 🚀
3. Team Members	*Arnav Tyagi (Design).* E20CSE065 *Dev Rajpal (Documentation)* E20CSE062 *Divyansh Palia (Developer)* E20CSE044 *Parijat Rai (Front end Developer)* E20CSE020
3. Abstract	***Introduction/Background:*** From the moment we were given this project we knew that it had to be something that could benefit the masses. The sole purpose of making a python program for a project was in order to utilise its automation prowess. Going through the coronavirus symptoms and its problems ourselves we know that COVID-19 prevention was a very necessary and buzzing problem. We wanted to do our share of work as well. Hence we decided to make a mask detection software which will help to identify those who don't wear masks properly and help to avoid spread in public spaces. ***Objectives:*** *Odyssey objectifies the Vision software as a tool used by retailers , public places , Railway Stations, Airport ,Bus stands to pulse out individuals without masks in order to protect public spread of deadly Covid-19 .* ***Methods:*** First, We would be using python to make the main logic and vision of our service. We will use Python libraries called Open-cv which enables computer vision. This would help us to identify whether a person is wearing a mask or not. We will also be designing a WebApi for the same using Python and use frameworks like Django or Flask for our website development. If possible we would also try to integrate it with Raspberry Pie making it a complete combination of hardware and software. **Keywords:**Health, Automation ,Open CV ,Masks ,Covid 19, Corona Virus,Python

4. Introduction, Review of Literature and Background	Looking at the current scenario of the world during the pandemic with the constant increase in the number of coronavirus cases and the new mutation of the virus in the United Kingdom the virus is now spreading much faster than before. For the time being, there are some vaccines that have been given the approval to be used for treating coronavirus but the citizens are afraid of side effects of the vaccine. Hence for the time being the only way to prevent the coronavirus is by wearing a mask and maintaining social distancing but there are people who don't follow these guidelines and put people around them in a dangerous situation and therefore to prevent this we introduce you to CAUGHT YOU!!. CAUGHT YOU!! is a software that verifies whether a person is wearing a mask or not. This software will be used at the entry point of supermarkets, malls, and grocery stores, and places where people visit regularly, If the person is not wearing a mask the owner of the shop/ place will get a notification about it and it won't allow the person to enter into the shop/place. This will prevent widespread.
5. Objectives: Project Aim	*CAUGHT YOU!! will prevent people who are not wearing a mask to enter public areas so that the extent to which the virus can spread can be decreased. This will help all of us to feel much safer while we are buying basic necessities.If some certain pre-decided conditions are met then a certain instruction protocol will be initiated. We will use this in opening a shop door automatically if someone is detected wearing a mask properly, and if not then the doors won't open….*

6. Methods and Materials	***Project Design :*** *Project Design: Starting from the beginning we create a Mask detection software using already uploaded images with and without a mask on. When the condition of wearing a mask is met to a satisfactory level, a certain instruction set will be initiated which will control the opening and closing of automated doors.Project Design: Starting from the beginning we create a Mask detection software using already uploaded images with and without a mask on. When the condition of wearing a mask is met to a satisfactory level, a certain instruction set will be initiated which will control the opening and closing of automated doors. When completed, "Caught you!!" will be able to perform digital image processing using edge to edge mapping using opencv and keras .* ***Hardware Specification:*** *A full stacked computer should be used with Numpy, Tensorflow libraries installed in it , Raspberry pie 3 , Arduino uno , OmniVision OV5647 , Sony IMX219.* ***Outcome Measures:*** *** ***Primary :*** *Primary: When in its full setup Caught you !! will perform digital image processing taken the face as input in use of computer vision / graphics and AI edge to edge mapping would create datasets which is custom made with using real mask images in it with Python script with Keras, and TensorFlow as the backend.* * ***Secondary :*** *This Will help in reducing the spread of covid and other communicable diseases as the doors will be automated and will open if the person wears a mask. Thus wearing a mask will become a compulsion. It Will help to increase the trust of customers as they know they will be in safe and conducive premises.* **Drawbacks and the limitation:** 1. People are still not open to their face data being processed and are not eager to give their consent. 2. False detection of not wearing masks can cause problems. There's also the risk of errors due to flaws in the technology. 3. Loss of clear line of sight - our detection system might fail, in case if something is obstructing someone's face or the face isn't visible from the front view. ***Conclusion:****We all know Covid has changed everyone's lifestyle and people have adopted new ways to handle stuff around them. Mask being the new normal! But few people still don't follow rules which put them as well as others around them in danger. And to this problem we The Tech-Odyssey came forward with a solution "CAUGHT YOU!!" an open-cv software that is used to detect face masks.*

7. Potential Impact	*Almost for the past one year, we all have been compromising our state of living due to the pandemic. For the initial months, we locked up ourselves inside our houses and went out only to buy our basic necessities. Time passed and we thought that we were getting habitual to it, so we started to go out to malls, restaurants and various other places like we used to go, but actually, due to that we just made it difficult for ourselves as the cases started increasing exponentially. The times have changed now, we have to go to work almost every day so that we can earn and sustain, going out is dangerous for us as well for our family but it has to be done. So what we can do is to make our workplace and our markets safer by ensuring that everyone is wearing a mask. Since humans inevitably break rules therefore it is necessary for us to have software that will ensure our safety. Since the door will open automatically then the points of contact will decrease and hence the chances of spreading will decrease as well. Therefore by using CAUGHT YOU!! We tend to make our environment much safer so that all of us can work peacefully.*
8. Future Plans	Forward hand on application of computer vision into WebAPI followed by Adafruit Raspberry Pie 3 .
9. References	*Tensorflow Handbook , Numpy Handbook , Youtube , Google, Udemy course by Jose portilla.*