American University SHARJAH (AUS) SUMMER camp Report

BY-Aadil Chasmawala, Leaders Private School

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AMERICAN UNIVERSITY SHARJAH (AUS) SUMMER CAMP REPORT

BY-Aadil Chasmawala, Leaders Private School

I had got a wonderful opportunity for taking part in the computer science summer camp held at AUS .It was a 6 day long summer camp and I learned a lot of new things such as Working of logic gates, networking, programming smart devices ,Building a mobile app ,Machine learning etc.

Here is a short report of all the Topics that we covered in 5 days:

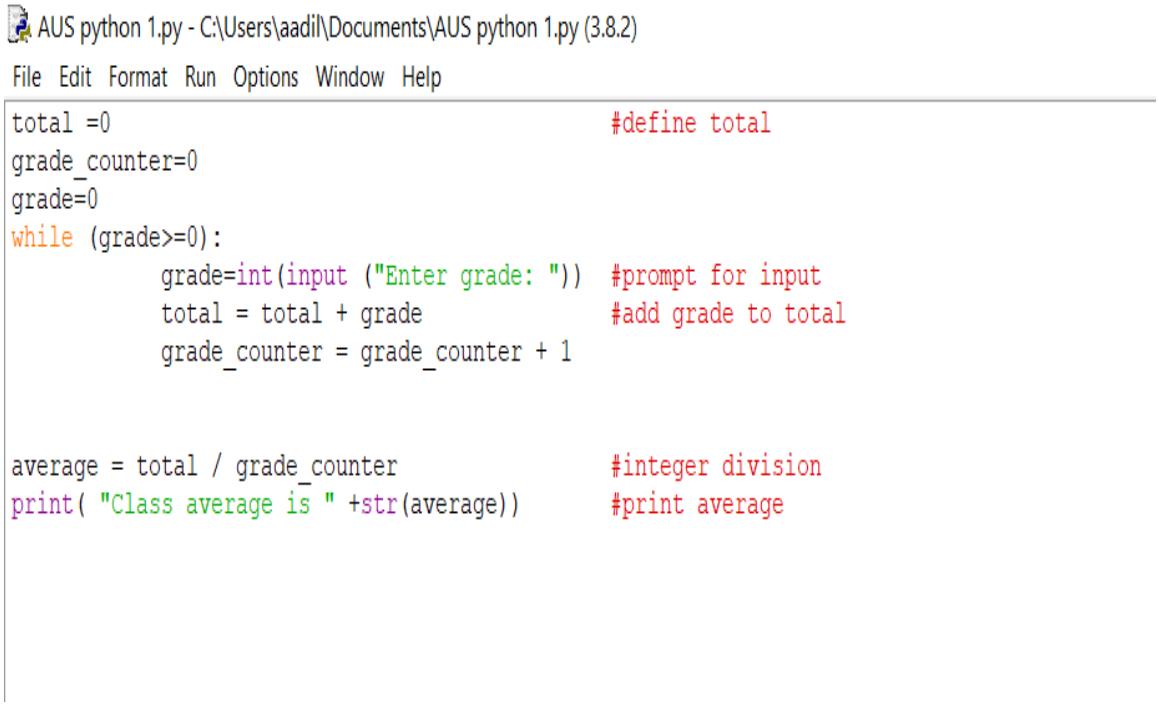
DAY 1(LOGIC GATES AND NUMBERING SYSTEMS)

On the first day, we learnt about logic gates and the arrangement of transistors for building different types of logic gates, we also learnt about the different kinds of numbering systems: Binary, Decimal, Octal, Hexadecimal and conversion among them. Then we tried it out for ourselves using a Minecraft like game called minetest .All the logic gates were there in the inventory (we used a mod) and we experimented with different circuit arrangements.

BUILDING LOGIC GATES IN MINETEST

DAY2-PYTHON AND SCRATCH PROGRAMMING

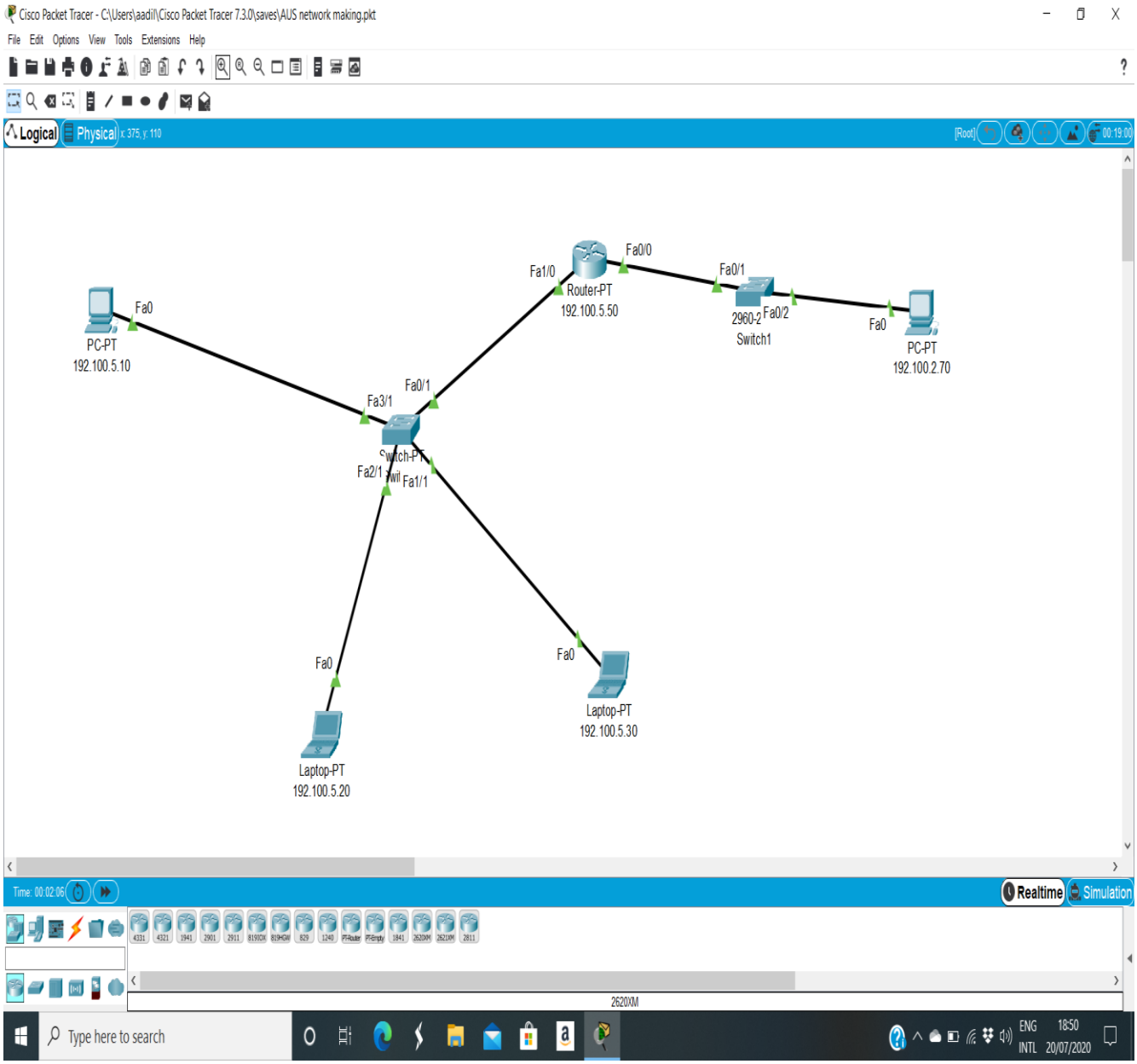
On the second day we learnt about python programming and its basics .Since most of it is included in our current syllabus, the programs were a good revision to me.We also made a few programs in scratch.



Making a program to find average marks of a class using while loops

DAY-3-NETWORKING USING CISCO PACKET TRACER

On the third day, we learnt the basics of data and networks such as ip address topologies etc. and built and simulated networks on a network simulator called cisco packet tracer. We connected various devices, specified their Ip address and checked whether they could communicate by pinging from one device to others. We made different topologies in the simulator.



Building a network topology

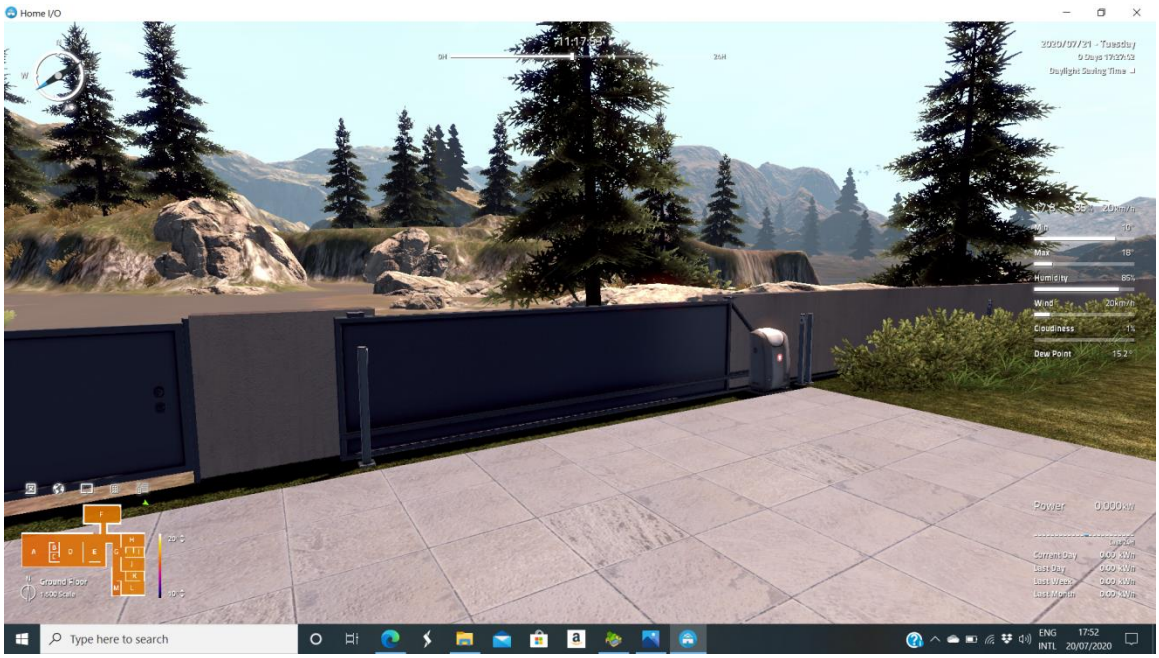
DAY-4-IOT AND PROGRAMMING A SMART HOME(HOME IO SIMULATOR)

We learnt about Iot(internet of things)and its rapid expansion and development in recent years. We programmed the front gate of a smart home to open and close when it detects and object in 4 different ways:

1. Using the built in tablet in home IO

2. Connect IO
3. Scratch
4. Python

Home IO simulation



Front gate(which was programmed to open and close)

Programming using scratch

homeio-sample (1).py - C:\Users\aadil\Downloads\homeio-sample (1).py (3.8.2)

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```
import sys
import time
import clr

clr.AddReference('EngineIO')

from EngineIO import *

print("Home I/O & Python are such good friends thanks to pythonnet!")

gateInfrared1 = MemoryMap.Instance.GetBit(262, MemoryType.Input)
gateInfrared2 = MemoryMap.Instance.GetBit(263, MemoryType.Input)
gateOpened = MemoryMap.Instance.GetBit(260, MemoryType.Input)
gateClosed = MemoryMap.Instance.GetBit(261, MemoryType.Input)

openGate = MemoryMap.Instance.GetBit(193, MemoryType.Output)
closeGate = MemoryMap.Instance.GetBit(194, MemoryType.Output)


while True:
        MemoryMap.Instance.Update()
        if(gateInfrared1.Value or gateInfrared2.Value) and not gateOpened.Value:
                openGate.Value = 1
                closeGate.Value = 0
        elif (not gateInfrared1.Value) and (not gateInfrared2.Value) and (not gateClosed.Value):
                closeGate.Value = 1
                openGate.Value = 0
        else:
                openGate.Value = 0
                closeGate.Value = 0


# When we no longer need the MemoryMap we should call the Dispose method to release all the allocated resources.
MemoryMap.Instance.Dispose()

print("Bye!")
```

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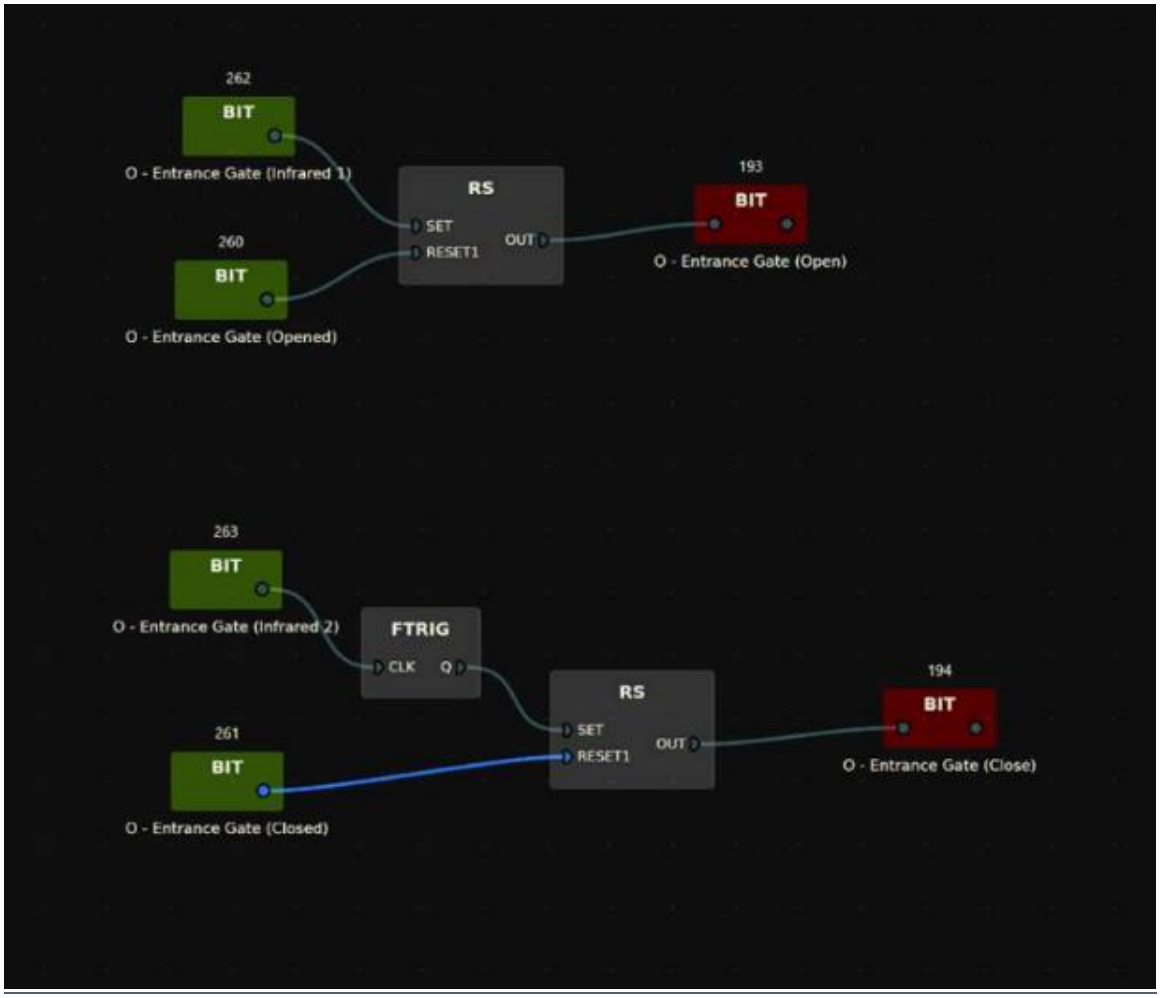
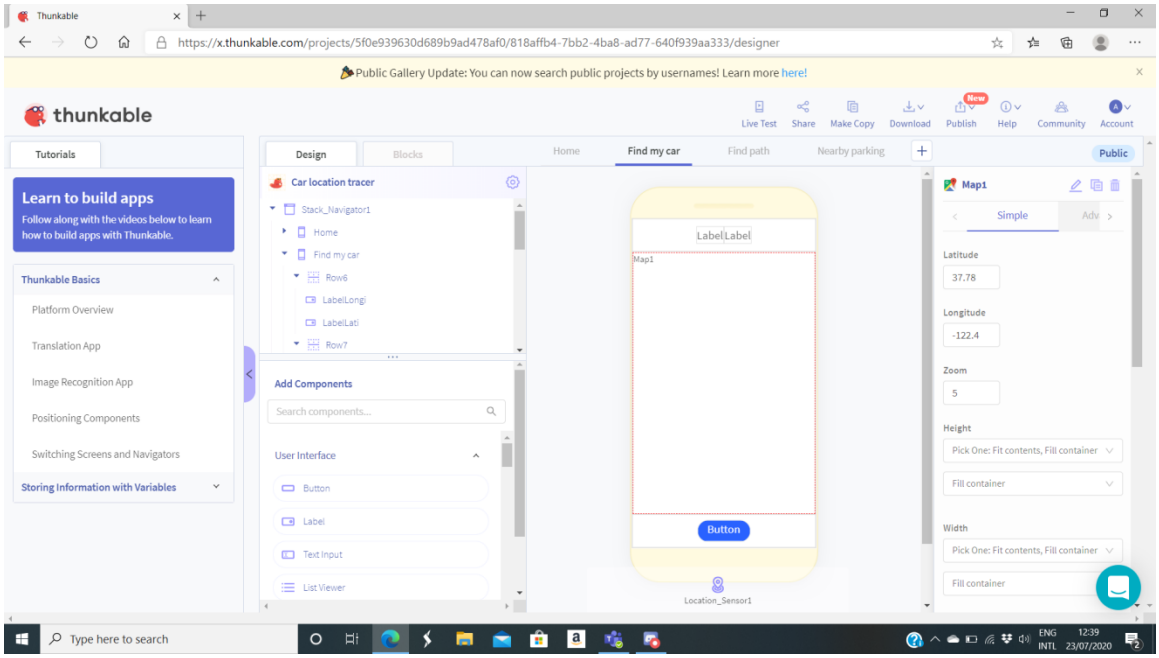
Programming front gate using python



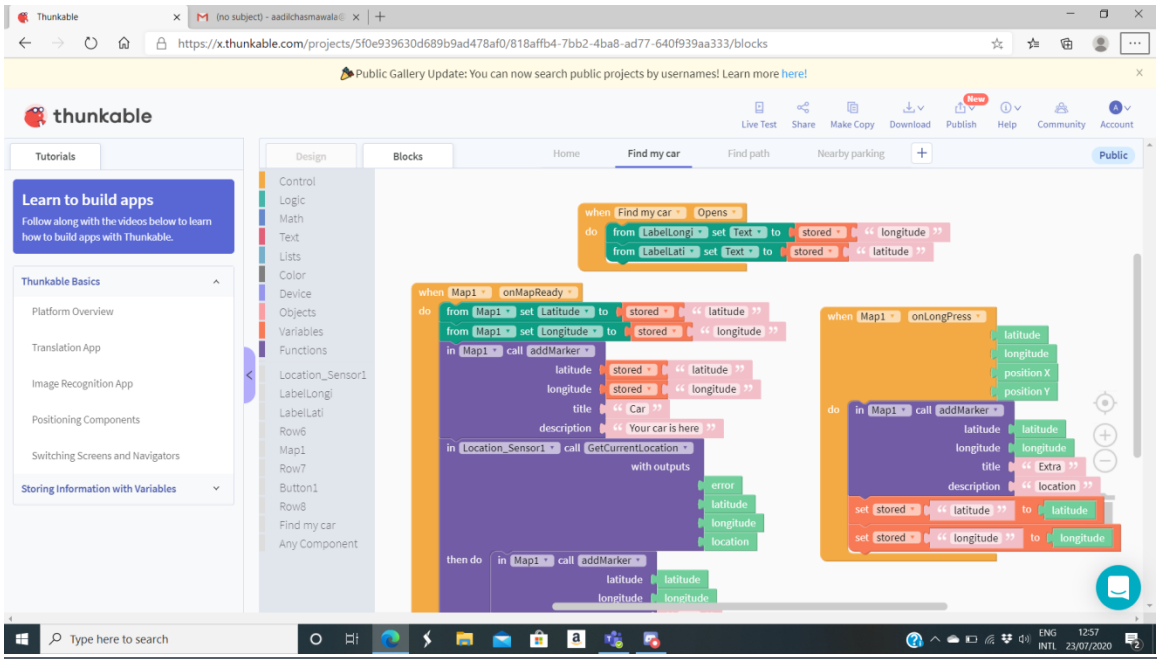
Programming using connect io

DAY-5 MOBILE APP DEVELOPMENT

We made an app for mobile phones using thunkable live. The purpose of the app was to record the car location and then find the path to the car later on using GPS navigation .



Programming the app on laptop



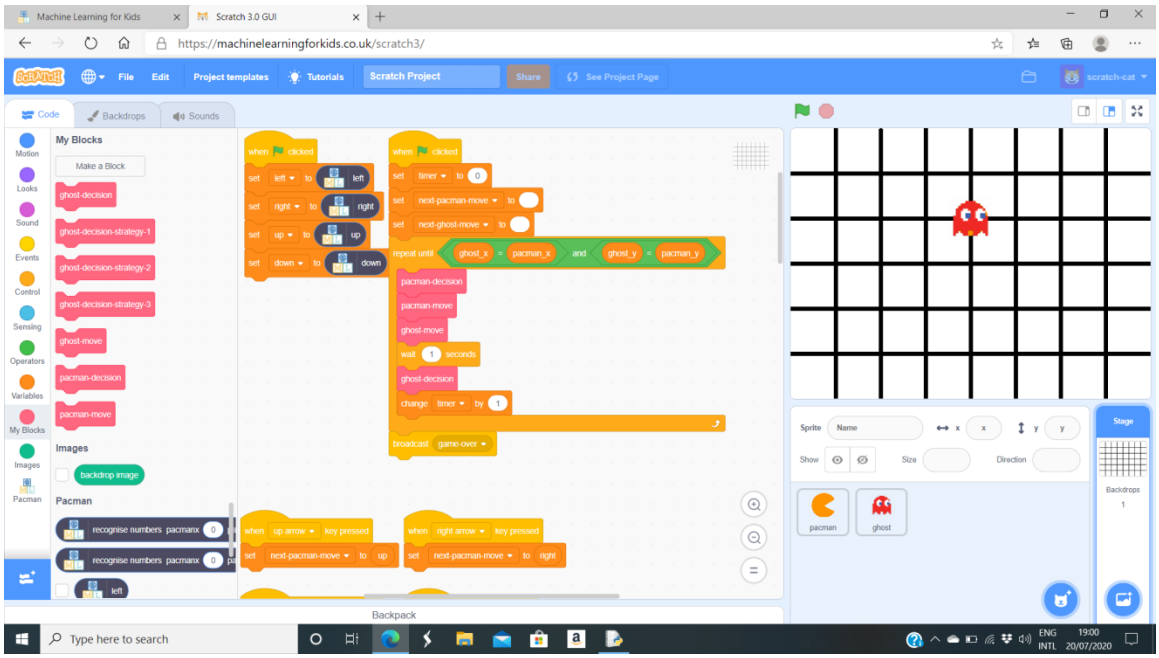
Using blocks to give instructions.

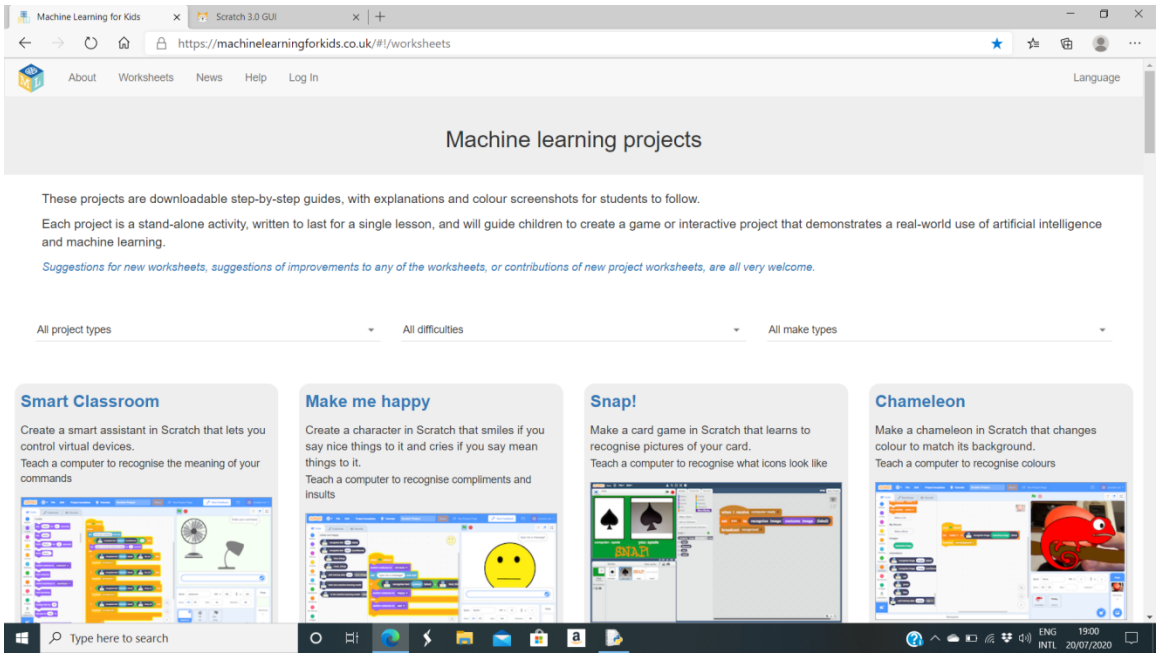
Working of app on mobile phone

DAY6-MACHINE LEARNING AND ARTIFICIAL INTELLIGENCE

We learnt about the basics of machine learning and AI. We taught an AI to recognize faces and objects or animals and tested it .We also made a program in scratch for making a machine learning model, Training it and then putting it to test.

We made a program of our choice. I made a Pac- man program in scratch in which Pac-man is controlled entirely by the computer on the basis of our playing of the game.





SUMMARY:

Overall, the camp was a very good experience to me.It introduced me to many exciting fields of computer science. The professors were very helpful in answering our queries and giving us additional material if we wanted to do further practice.

It was a great experience and I look forward to participate in such workshops again. I once again thank AUS for providing me this wonderful opportunity.

THANK YOU!