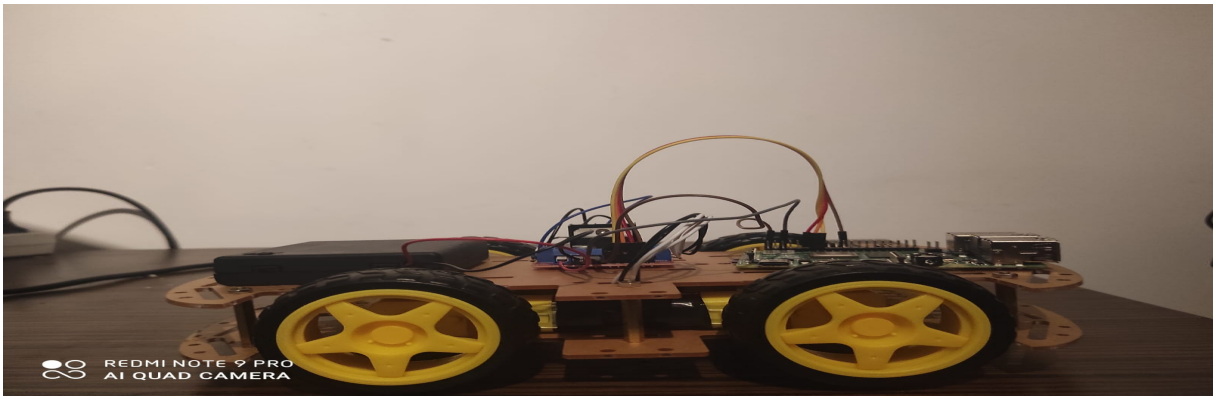
Smart AKB-1907

- **What Is AKB-1907 ?**

  AKB-1907 is a smart car project that can be controlled from an allowed device which can be an android phone or a computer. This car has been building from scratch in terms of both hardware and software.

- **What Are The Features Of AKB-1907 ?**

  This car can be controlled by allowed android phones and computers.
  AKB-1907 can measure the distance using Ultrasonic distance meter HC-SR04.
  AKB-1907 is able to take pictures(Camera Module For Raspberry Pi 4 Model B) constantly and store them for future using.
  AKB-1907 is going to detect the traffic lights and run them without any command from a remote controller.

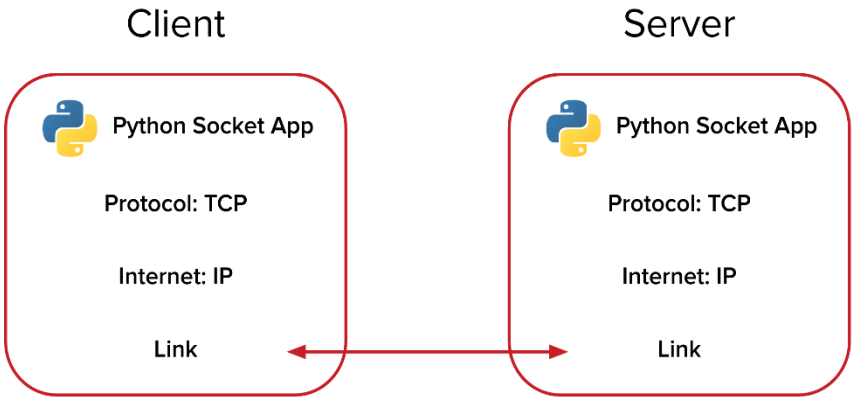


- **How Do You Provide The Communication Between Akb-1907 And Remote Controller. ?**

  We provide the communication by using a network socket which coded in Python programming language.(Python Socket API) for Local Area Network.

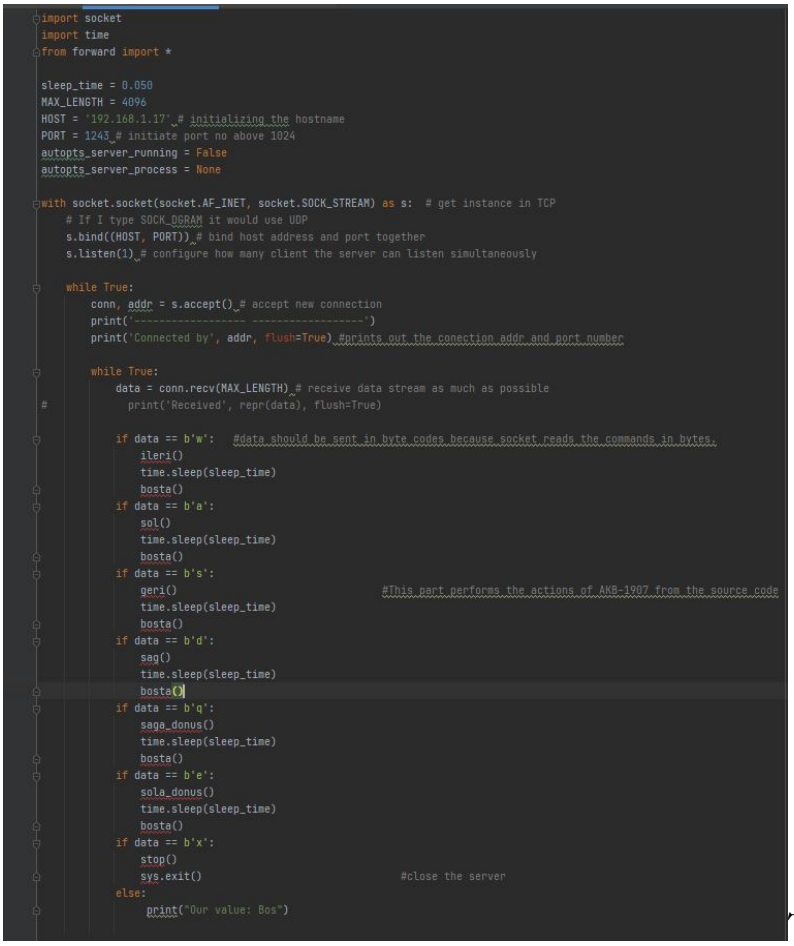
- **What Is A Netwrok Socket Technology ?**

  A network socket is a software structure within a network node of a computer network that serves as an endpoint for sending and receiving data across the network. The features of a socket defined by an API for the network architecture.



- **Where Is Socket Used?**

  Python Socket API is used in a client-server application framework. A server is a process that performs some functions on request from a client.



```
import socket
import time
from forward import *

sleep_time = 0.050
MAX_LENGTH = 4096
HOST = '192.168.1.17' # initializing the hostname
PORT = 1243 # initiate port no above 1024
autopts_server_running = False
autopts_server_process = None

with socket.socket(socket.AF_INET, socket.SOCK_STREAM) as s:  # get instance in TCP
    # If I type SOCK_DGRAM it would use UDP
    s.bind((HOST, PORT)) # bind host address and port together
    s.listen(1) # configure how many client the server can listen simultaneously

    while True:
        conn, addr = s.accept() # accept new connection
        print('-------------------- --------------------')
        print('Connected by', addr, flush=True) #prints out the conection addr and port number

        while True:
            data = conn.recv(MAX_LENGTH) # receive data stream as much as possible
#           print('Received', repr(data), flush=True)

            if data == b'w':   #data should be sent in byte codes because socket reads the commands in bytes.
                ileri()
                time.sleep(sleep_time)
                bosta()
            if data == b'a':
                sol()
                time.sleep(sleep_time)
                bosta()
            if data == b's':
                geri()                              #This part performs the actions of AKB-1907 from the source code
                time.sleep(sleep_time)
                bosta()
            if data == b'd':
                sag()
                time.sleep(sleep_time)
                bosta()
            if data == b'q':
                saga_donus()
                time.sleep(sleep_time)
                bosta()
            if data == b'e':
                sola_donus()
                time.sleep(sleep_time)
                bosta()
            if data == b'x':
                stop()
                sys.exit()                          #close the server
            else:
                print("Our value: Bos")
```

This is Server socket.

- **How Many Network Sockets Technologies Are There?**

  There are four types of sockets available;

  Stream Socket, Datagram Sockets, Raw Sockets , Sequenced Packet Sockets

- **Which Type Of Socket Did You Use In This Project?**

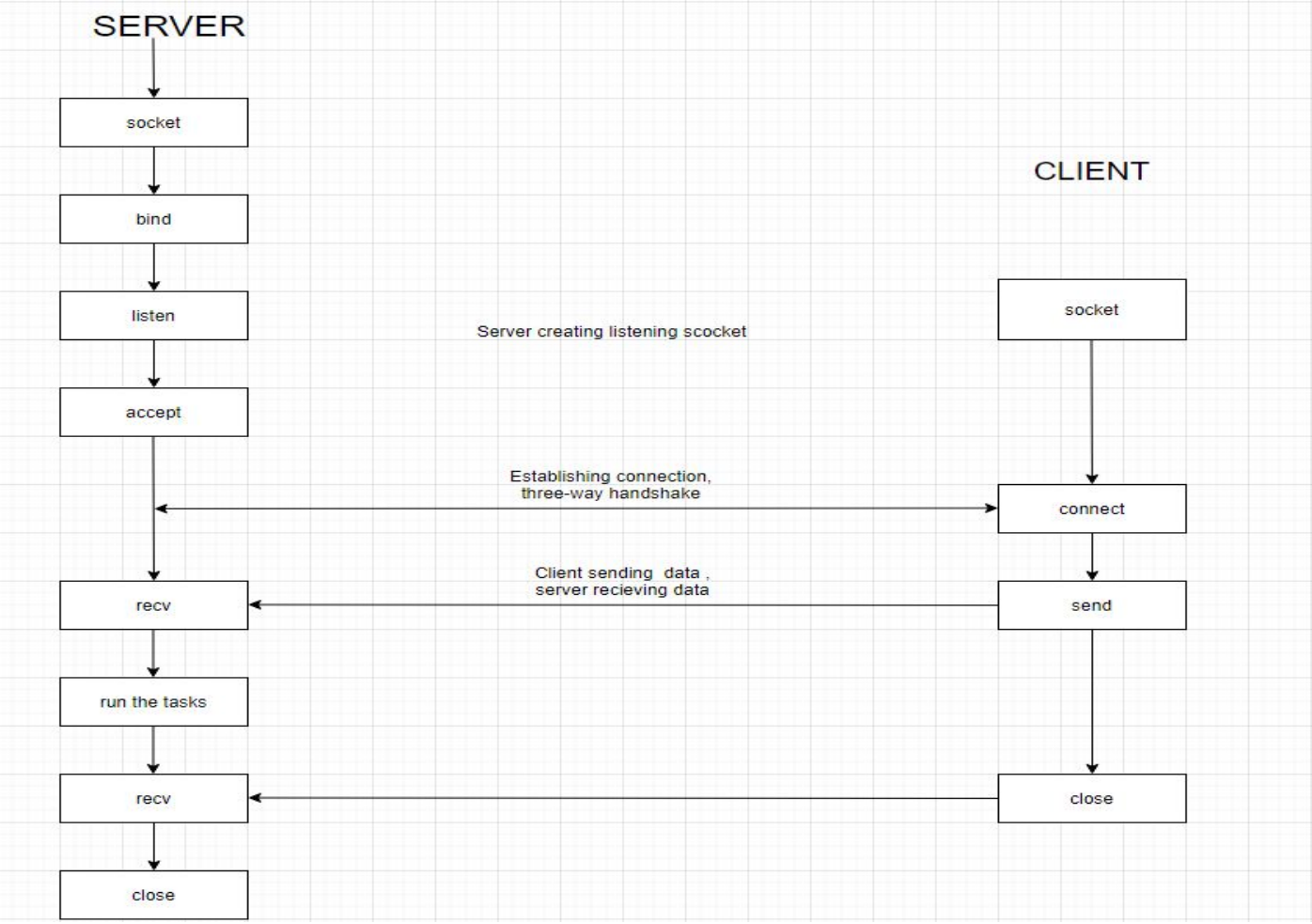
  Stream Sockets have been used in the Project.

```
import sys
import tkinter as tk
import socket

#
clientSocket = socket.socket(socket.AF_INET, socket.SOCK_STREAM)# instantiate
clientSocket.connect(("192.168.1.16", 1243))# as both code is running in Local Area Network(LAN) and connect to the serve
data = None# take input


def key_input(event):
    # print ('Key:', event.char) #That is a key event for detecting proper keys to control the car.{W,A,S,D,Q,E and X}
    key_press = event.char
    data = key_press.lower()
    print(data)
    clientSocket.send(data.encode())  # send message in bytes

    # if key_press.lower() == 'w':
    #
    #     clientSocket.send(data.encode())
    # elif key_press.lower() == 's':
    #
    # elif key_press.lower() == 'a':
    #     sol(sleep_time)
    # elif key_press.lower() == 'd':
    #     sag(sleep_time)
    # elif key_press.lower() =='q':
    #     sola_donus(sleep_time)
    # elif key_press.lower() == 'e':
    #     saga_donus(sleep_time)
    # else:
    #     gpio.cleanup()


root = tk.Tk()
root.bind('<KeyPress>', key_input)
root.mainloop()
```

This is Client socket.

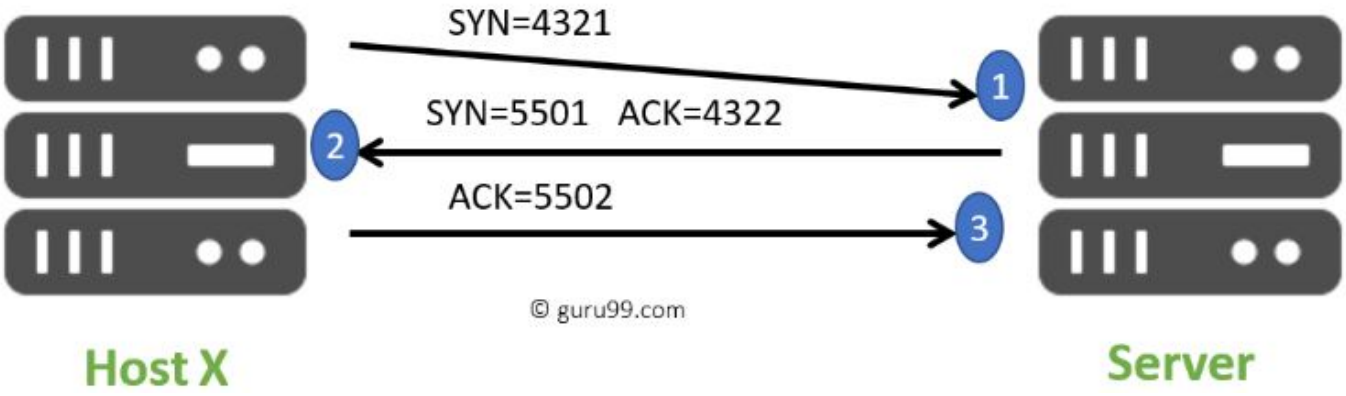
- **What Is A Stream Socket And The Reason For Using Stream Socket.**

  A stream socket transmits data reliably, in order, and with out-of-band capabilities. Stream sockets are usually implemented using TCP so that tasks can run across any network using TCP/IP protocol.



- **What Is TCP Three-Way Handshake?**

  TCP 3-way handshake is a process that is used in a TCP/IP network to provide a connection between the server and client.



Now, It is time to watch the implementation of the network socket technology to real life Project AKB-1907.