CODE For Programming Esp32-cam

```cpp
#include <WebServer.h>
#include <WiFi.h>
#include <esp32cam.h>

const char* WIFI_SSID = "*wifiname*";
const char* WIFI_PASS = "*wifipassword*";

WebServer server(80);


static auto loRes = esp32cam::Resolution::find(320, 240);
static auto midRes = esp32cam::Resolution::find(350, 530);
static auto hiRes = esp32cam::Resolution::find(800, 600);
void serveJpg()
{
  auto frame = esp32cam::capture();
  if (frame == nullptr) {
    Serial.println("CAPTURE FAIL");
    server.send(503, "", "");
    return;
  }
  Serial.printf("CAPTURE OK %dx%d %db\n", frame->getWidth(), frame->getHeight(),
                static_cast<int>(frame->size()));

  server.setContentLength(frame->size());
  server.send(200, "image/jpeg");
  WiFiClient client = server.client();
  frame->writeTo(client);
}

void handleJpgLo()
{
  if (!esp32cam::Camera.changeResolution(loRes)) {
    Serial.println("SET-LO-RES FAIL");
  }
  serveJpg();
}

void handleJpgHi()
{
  if (!esp32cam::Camera.changeResolution(hiRes)) {
    Serial.println("SET-HI-RES FAIL");
  }
  serveJpg();
}

void handleJpgMid()
```

```cpp
{
  if (!esp32cam::Camera.changeResolution(midRes)) {
    Serial.println("SET-MID-RES FAIL");
  }
  serveJpg();
}


void  setup(){
  Serial.begin(115200);
  Serial.println();
  {
    using namespace esp32cam;
    Config cfg;
    cfg.setPins(pins::AiThinker);
    cfg.setResolution(hiRes);
    cfg.setBufferCount(2);
    cfg.setJpeg(80);

    bool ok = Camera.begin(cfg);
    Serial.println(ok ? "CAMERA OK" : "CAMERA FAIL");
  }
  WiFi.persistent(false);
  WiFi.mode(WIFI_STA);
  WiFi.begin(WIFI_SSID, WIFI_PASS);
  while (WiFi.status() != WL_CONNECTED) {
    delay(500);
  }
  Serial.print("http://");
  Serial.println(WiFi.localIP());
  Serial.println("  /cam-lo.jpg");
  Serial.println("  /cam-hi.jpg");
  Serial.println("  /cam-mid.jpg");

  server.on("/cam-lo.jpg", handleJpgLo);
  server.on("/cam-hi.jpg", handleJpgHi);
  server.on("/cam-mid.jpg", handleJpgMid);

  server.begin();
}

void loop()
{
  server.handleClient();
}
```

PYTHON Code for Object Detection

```python
import cv2
import matplotlib.pyplot as plt
import cvlib as cv
import urllib.request
import numpy as np
from cvlib.object_detection import draw_bbox
import concurrent.futures

url='http://192.168.221.220/cam-mid.jpg'
im=None

def run1():
    cv2.namedWindow("live transmission", cv2.WINDOW_AUTOSIZE)
    while True:
        img_resp=urllib.request.urlopen(url)
        imgnp=np.array(bytearray(img_resp.read()),dtype=np.uint8)
        im = cv2.imdecode(imgnp,-1)

        cv2.imshow('live transmission',im)
        key=cv2.waitKey(5)
        if key==ord('q'):
            break

    cv2.destroyAllWindows()

def run2():
    cv2.namedWindow("detection", cv2.WINDOW_AUTOSIZE)
    while True:
        img_resp=urllib.request.urlopen(url)
        imgnp=np.array(bytearray(img_resp.read()),dtype=np.uint8)
        im = cv2.imdecode(imgnp,-1)

        bbox, label, conf = cv.detect_common_objects(im)
        im = draw_bbox(im, bbox, label, conf)

        cv2.imshow('detection',im)
        key=cv2.waitKey(5)
        if key==ord('q'):
            break

    cv2.destroyAllWindows()

if __name__ == '__main__':
    print("started")
    with concurrent.futures.ProcessPoolExecutor() as executer:
            f1= executer.submit(run1)
            f2= executer.submit(run2)
```

Objects in the Database

Person	Bird	Horse	Backpack	Bottle	Chair
Bicycle	Cat	Sheep	Umbrella	Wine glass	Sofa
Car	Dog	Cow	Handbag	Cup	Pottedplant
Motorbike	Horse	Elephant	Tie	Fork	Bed
Aeroplane	Sheep	Bear	Suitcase	Knife	Diningtable
Bus	Cow	Zebra	Frisbee	Spoon	Toilet
Train	Elephant	Giraffe	Skis	Bowl	Tvmonitor
Truck	Bear	Backpack	Snowboard	Banana	Laptop
Boat	Zebra	Umbrella	Sports ball	Apple	Mouse
Traffic light	Giraffe	Handbag	Kite	Sandwich	Remote
Fire hydrant	Backpack	Tie	Baseball bat	Orange	Keyboard
Stop sign	Umbrella	Suitcase	Baseball glove	Broccoli	Cell phone
Parking meter	Handbag	Frisbee	Skateboard	Carrot	Microwave
Bench	Tie	Skis	Surfboard	Hot dog	Oven
Bird	Suitcase	Snowboard	Tennis racket	Pizza	Toaster
Cat	Frisbee	Sports ball	Bottle	Donut	Sink
Dog	Skis	Kite	Wine glass	Cake	Refrigerator
Horse	Snowboard	Baseball bat	Cup	Chair	Book
Sheep	Sports ball	Baseball glove	Fork	Sofa	Clock
Cow	Kite	Skateboard	Knife	Pottedplant	Vase
Elephant	Tennis racket	Surfboard	Spoon	Bed	Scissors
Bear	Bottle	Tennis racket	Bowl	Diningtable	Teddy bear
Zebra	Wine glass	Bottle	Banana	Toilet	Hair drier
Giraffe	Cup	Wine glass	Apple	Tvmonitor	Toothbrush