

## Assignment -4

### Python Programming

Assignment Date	26 October 2022
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Student Roll Number	722819106103
Maximum Marks	2 Marks

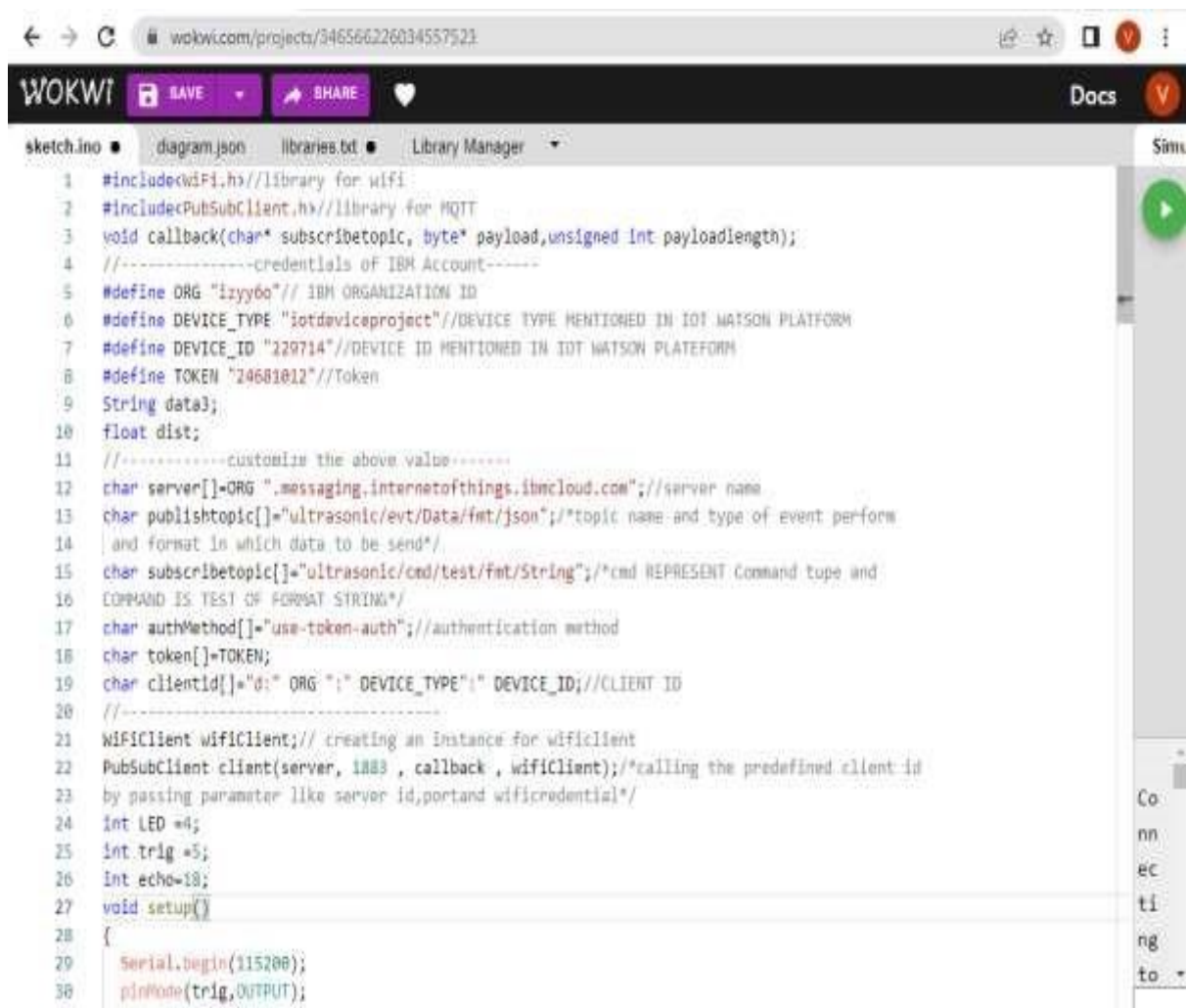
#### Question-1:

Write code and connections in wokwi for ultrasonic sensor.

Whenever distance is less than 100 cms send "alert" to ibm cloud and display in device recent events.

Upload document with wokwi share link and images of ibm cloud.

#### Solution:



```
1 #include<WiFi.h> //library for wifi
2 #include<PubSubClient.h> //library for MQTT
3 void callback(char* subscribetopic, byte* payload, unsigned int payloadlength);
4 //-----credentials of IBM Account-----
5 #define ORG "i7yy6o" // IBM ORGANIZATION ID
6 #define DEVICE_TYPE "iotdeviceproject" //DEVICE TYPE MENTIONED IN IOT WATSON PLATFORM
7 #define DEVICE_ID "229714" //DEVICE ID MENTIONED IN IOT WATSON PLATFORM
8 #define TOKEN "24681012" //Token
9 String data3;
10 float dist;
11 //-----customize the above value-----
12 char server[] = ORG ".messaging.internetofthings.ibmcloud.com"; //server name
13 char publishTopic[] = "ultrasonic/evt/Data/fmt/json"; //topic name and type of event perform
14 //and format in which data to be send*/
15 char subscribetopic[] = "ultrasonic/cmd/test/fmt/String"; //cmd REPRESENT Command tupe and
16 COMMAND IS TEST OF FORMAT STRING*/
17 char authMethod[] = "use-token-auth"; //authentication method
18 char token[] = TOKEN;
19 char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID; //CLIENT ID
20 //-----
21 WiFiClient wificlient; // creating an instance for wificlient
22 PubSubClient client(server, 1883, callback, wificlient); //calling the predefined client id
23 by passing parameter like server id,portand wificredential*/
24 int LED = 4;
25 int trig = 5;
26 int echo = 18;
27 void setup()
28 {
29   Serial.begin(115200);
30   pinMode(trig, OUTPUT);
```

← → ↺ wokwi.com/projects/346566226034557523

WOKWI

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Docs

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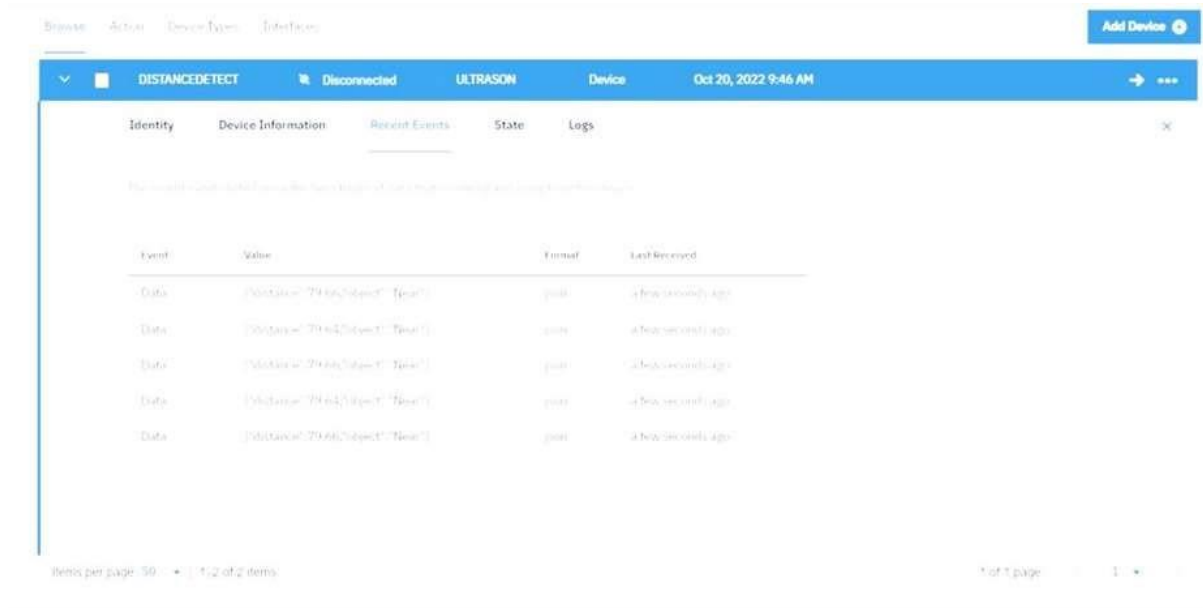
sketch.ino ● diagram.json libraries.txt ● Library Manager

61Serial.println("no object is near");  
62object="Near";  
63}  
64else  
65{  
66digitalWrite(LED,LOW);  
67Serial.println("no object found");  
68object="No";  
69}  
70String payload="{\"distance\":";  
71payload +=dist;  
72payload +=\",\" + \"\"object\"\":\";  
73payload += object;  
74payload += \"\"}\"";  
75  
76Serial.print("Sending payload: ");  
77Serial.println(payload);  
78if(client.publish(publishtopic, (char\*) payload.c\_str())){  
79Serial.println("Publish ok");/\* If its sucessfully upload data on the cloud then it will print  
80publish ok in serial monitor or else it will print poblish failed\*/  
81}  
82else{  
83Serial.println("Publish failed");  
84}  
85  
86void mqttconnect(){  
87if(!client.connected()){  
88Serial.print("Reconnecting client to ");  
89Serial.println(server);  
90while(!client.connect(clientid,authMethod, token)){  
91Serial.print(".");  
92delay(500);  
93}94}95}96}97}98}99}100}101}102}103}104}105}106}107}108}109}110}111}112}113}114}115}116}117}118}119}120}121}122}123}124}125}126}127}128}129}130}131}132}133}134}135}136}137}138}139}140}141}142}143}144}145}146}147}148}149}150}151}152}153}154}155}156}157}158}159}160}161}162}163}164}165}166}167}168}169}170}171}172}173}174}175}176}177}178}179}180}181}182}183}184}185}186}187}188}189}190}191}192}193}194}195}196}197}198}199}200}201}202}203}204}205}206}207}208}209}210}211}212}213}214}215}216}217}218}219}220}221}222}223}224}225}226}227}228}229}230}231}232}233}234}235}236}237}238}239}240}241}242}243}244}245}246}247}248}249}250}251}252}253}254}255}256}257}258}259}260}261}262}263}264}265}266}267}268}269}270}271}272}273}274}275}276}277}278}279}280}281}282}283}284}285}286}287}288}289}290}291}292}293}294}295}296}297}298}299}300}301}302}303}304}305}306}307}308}309}310}311}312}313}314}315}316}317}318}319}320}321}322}323}324}325}326}327}328}329}330}331}332}333}334}335}336}337}338}339}340}341}342}343}344}345}346}347}348}349}350}351}352}353}354}355}356}357}358}359}360}361}362}363}364}365}366}367}368}369}370}371}372}373}374}375}376}377}378}379}380}381}382}383}384}385}386}387}388}389}390}391}392}393}394}395}396}397}398}399}400}401}402}403}404}405}406}407}408}409}410}411}412}413}414}415}416}417}418}419}420}421}422}423}424}425}426}427}428}429}430}431}432}433}434}435}436}437}438}439}440}441}442}443}444}445}446}447}448}449}450}451}452}453}454}455}456}457}458}459}460}461}462}463}464}465}466}467}468}469}470}471}472}473}474}475}476}477}478}479}480}481}482}483}484}485}486}487}488}489}490}491}492}493}494}495}496}497}498}499}500}501}502}503}504}505}506}507}508}509}510}511}512}513}514}515}516}517}518}519}520}521}522}523}524}525}526}527}528}529}530}531}532}533}534}535}536}537}538}539}540}541}542}543}544}545}546}547}548}549}550}551}552}553}554}555}556}557}558}559}560}561}562}563}564}565}566}567}568}569}570}571}572}573}574}575}576}577}578}579}580}581}582}583}584}585}586}587}588}589}590}591}592}593}594}595}596}597}598}599}600}601}602}603}604}605}606}607}608}609}610}611}612}613}614}615}616}617}618}619}620}621}622}623}624}625}626}627}628}629}630}631}632}633}634}635}636}637}638}639}640}641}642}643}644}645}646}647}648}649}650}651}652}653}654}655}656}657}658}659}660}661}662}663}664}665}666}667}668}669}670}671}672}673}674}675}676}677}678}679}680}681}682}683}684}685}686}687}688}689}690}691}692}693}694}695}696}697}698}699}700}701}702}703}704}705}706}707}708}709}710}711}712}713}714}715}716}717}718}719}720}721}722}723}724}725}726}727}728}729}730}731}732}733}734}735}736}737}738}739}740}741}742}743}744}745}746}747}748}749}750}751}752}753}754}755}756}757}758}759}760}761}762}763}764}765}766}767}768}769}770}771}772}773}774}775}776}777}778}779}780}781}782}783}784}785}786}787}788}789}790}791}792}793}794}795}796}797}798}799}800}801}802}803}804}805}806}807}808}809}810}811}812}813}814}815}816}817}818}819}820}821}822}823}824}825}826}827}828}829}830}831}832}833}834}835}836}837}838}839}840}841}842}843}844}845}846}847}848}849}850}851}852}853}854}855}856}857}858}859}860}861}862}863}864}865}866}867}868}869}870}871}872}873}874}875}876}877}878}879}880}881}882}883}884}885}886}887}888}889}890}891}892}893}894}895}896}897}898}899}900}901}902}903}904}905}906}907}908}909}910}911}912}913}914}915}916}917}918}919}920}921}922}923}924}925}926}927}928}929}930}931}932}933}934}935}936}937}938}939}940}941}942}943}944}945}946}947}948}949}950}951}952}953}954}955}956}957}958}959}960}961}962}963}964}965}966}967}968}969}970}971}972}973}974}975}976}977}978}979}980}981}982}983}984}985}986}987}988}989}990}991}992}993}994}995}996}997}998}999}1000}1001}1002}1003}1004}1005}1006}1007}1008}1009}1010}1011}1012}1013}1014}1015}1016}1017}1018}1019}1020}1021}1022}1023}1024}1025}1026}1027}1028}1029}1030}1031}1032}1033}1034}1035}1036}1037}1038}1039}1040}1041}1042}1043}1044}1045}1046}1047}1048}1049}1050}1051}1052}1053}1054}1055}1056}1057}1058}1059}1060}1061}1062}1063}1064}1065}1066}1067}1068}1069}1070}1071}1072}1073}1074}1075}1076}1077}1078}1079}1080}1081}1082}1083}1084}1085}1086}1087}1088}1089}1090}1091}1092}1093}1094}1095}1096}1097}1098}1099}1100}1101}1102}1103}1104}1105}1106}1107}1108}1109}1110}1111}1112}1113}1114}1115}1116}1117}1118}1119}1120}1121}1122}1123}1124}1125}1126}1127}1128}1129}1130}1131}1132}1133}1134}1135}1136}1137}1138}1139}1140}1141}1142}1143}1144}1145}1146}1147}1148}1149}1150}1151}1152}1153}1154}1155}1156}1157}1158}1159}1160}1161}1162}1163}1164}1165}1166}1167}1168}1169}1170}1171}1172}1173}1174}1175}1176}1177}1178}1179}1180}1181}1182}1183}1184}1185}1186}1187}1188}1189}1190}1191}1192}1193}1194}1195}1196}1197}1198}1199}1200}1201}1202}1203}1204}1205}1206}1207}1208}1209}1210}1211}1212}1213}1214}1215}1216}1217}1218}1219}1220}1221}1222}1223}1224}1225}1226}1227}1228}1229}1230}1231}1232}1233}1234}1235}1236}1237}1238}1239}1240}1241}1242}1243}1244}1245}1246}1247}1248}1249}1250}1251}1252}1253}1254}1255}1256}1257}1258}1259}1260}1261}1262}1263}1264}1265}1266}1267}1268}1269}1270}1271}1272}1273}1274}1275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OUTPUT:  
DATA IS SENT TO IBM CLOUD WHEN NO OBJECT IS DETECTED

Event	Value	Format	Last Received
Data	Distance: 79.64/object: Near	json	4 hours 50 mins ago
Data	Distance: 79.64/object: Near	json	4 hours 50 mins ago
Data	Distance: 79.64/object: Near	json	4 hours 50 mins ago
Data	Distance: 79.64/object: Near	json	4 hours 50 mins ago
Data	Distance: 79.64/object: Near	json	4 hours 50 mins ago

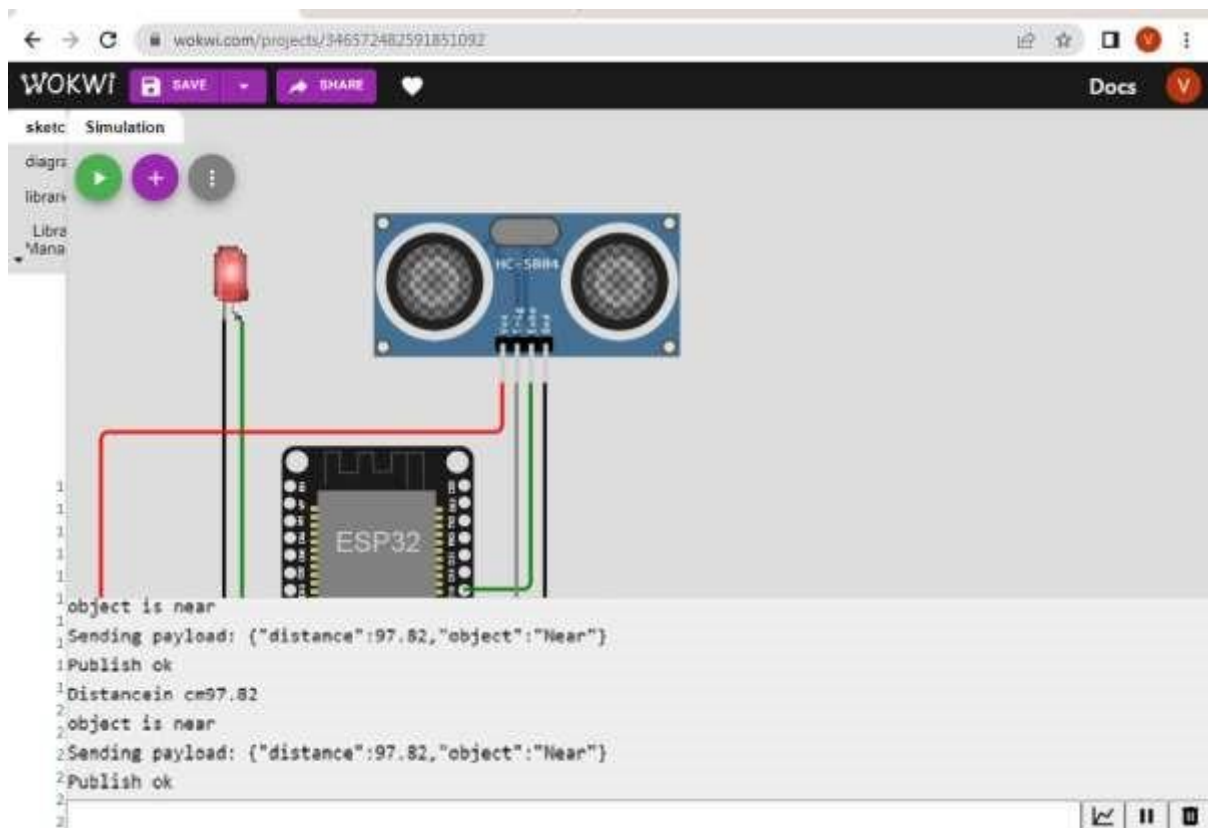
## When no object is detected



Wokwi interface showing the 'DISTANCEDETECT' device status as 'Disconnected'. The 'Recent Events' tab is active, displaying a table of events where the 'object' is 'None'.

Event	Value	Format	Last Received
Data	{distance: 79.62, object: "None"}	json	a few seconds ago
Data	{distance: 79.62, object: "None"}	json	a few seconds ago
Data	{distance: 79.62, object: "None"}	json	a few seconds ago
Data	{distance: 79.62, object: "None"}	json	a few seconds ago
Data	{distance: 79.62, object: "None"}	json	a few seconds ago

## When object is detected in ultrasonic detector



Wokwi interface showing a simulation of an ESP32 connected to an HC-SR04 ultrasonic sensor. The console output shows the sensor detecting an object at 97.82 cm and publishing the data.

```
1 object is near
1 Sending payload: {"distance":97.82,"object":"Near"}
1 Publish ok
1 Distance in cm 97.82
2 object is near
2 Sending payload: {"distance":97.82,"object":"Near"}
2 Publish ok
```