

$$V_0 = \frac{R_T}{R_T + R_D} \cdot E \rightarrow E \cdot R_T = V_0 R_T + V_0 R_D$$

$$(E - V_0) R_T = V_0 R_D$$

$$R_T = \frac{V_0 R_D}{E - V_0} = \frac{(0.403)(10K)}{5 - 0.403}$$

$$= 0.877 K$$

$$\frac{1}{T} = \frac{1}{T_0} + \frac{1}{\beta} \ln \frac{R_T}{R_0}$$

$\downarrow$ 273.15 + 25 $\downarrow$ 3950 $R_0 \rightarrow 10K$

$$\frac{1}{T} = \frac{1}{298.15} + \frac{1}{3950} \ln \frac{0.877}{10} = 0.00274$$

$$\therefore T = \frac{1}{0.00274} = 365.249 - 273.15 = 92.1^\circ C$$

④ DISPLAY T VALUE

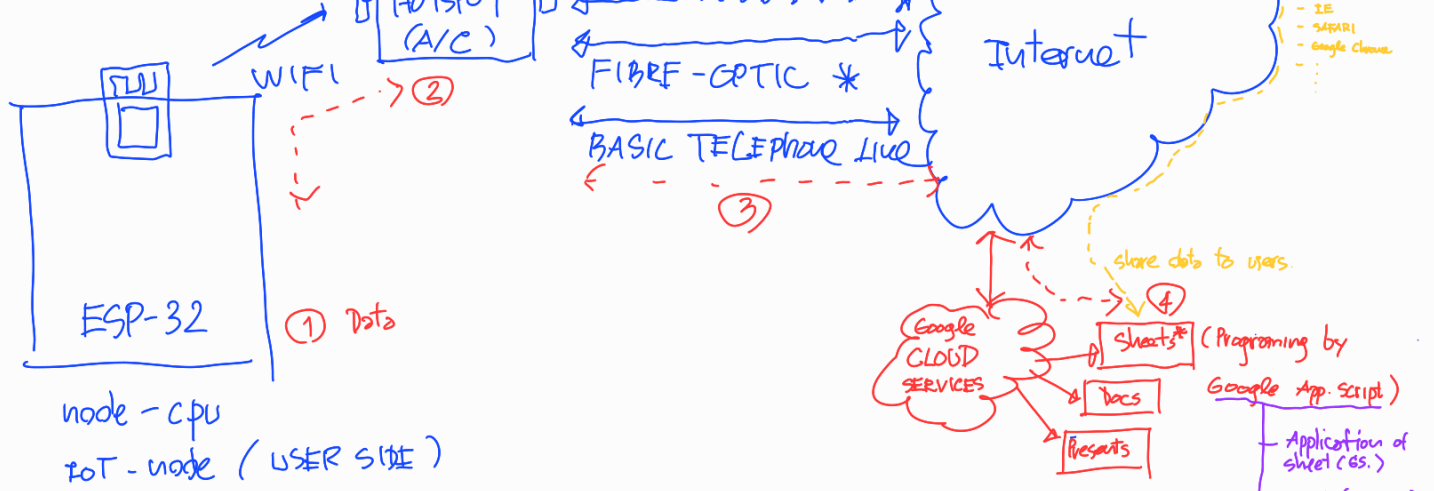
- OUT TO SERIAL PORT (USB) → COMPUTER
- CONNECT SOME DISPLAY DEVICE EX OLED LCD, 7-SEGMENT, etc.

⑤ USE OLED → INCLUDE OLED LIBRARY

- DISPLAY T VALUE TO OLED SCREEN

BASIC IOT over Google App. script - Google sheet
free license → one-way data-publishing

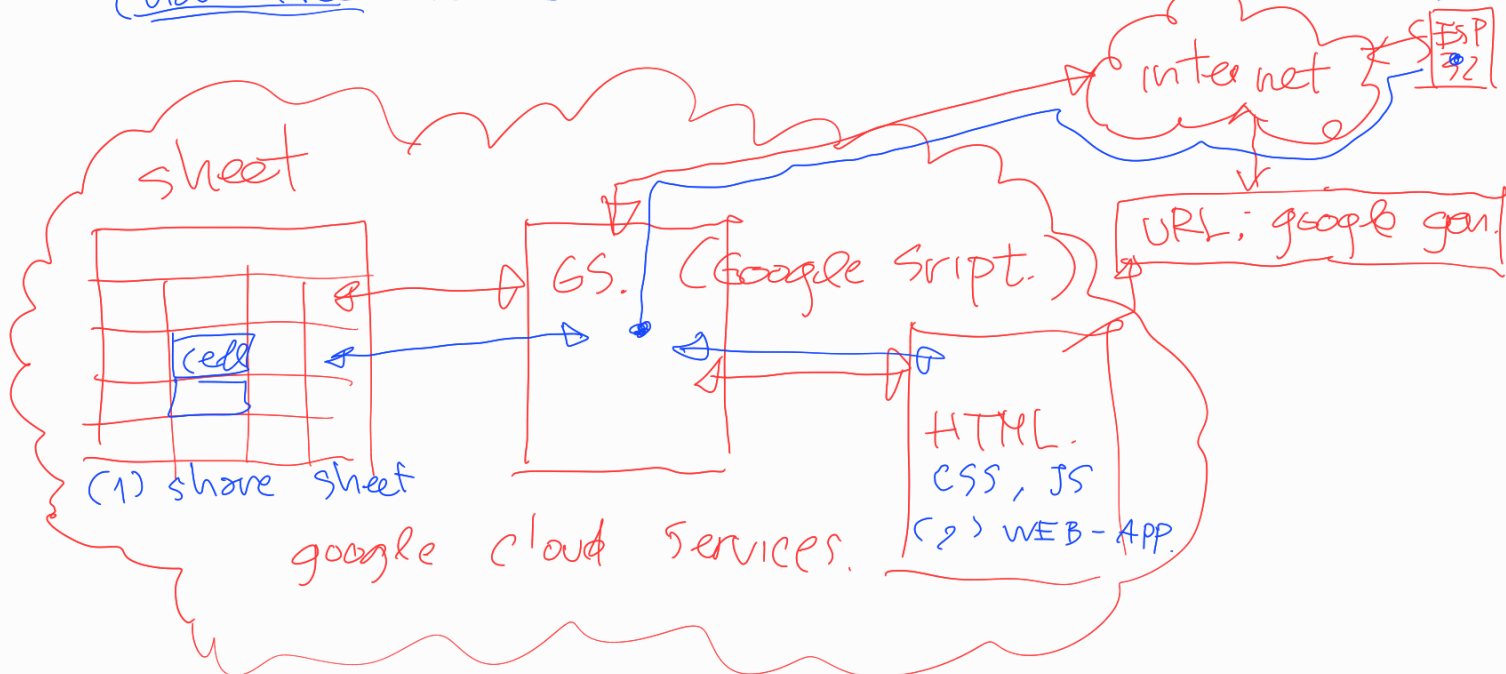




⑥ connect WIFI HOTSPOT ← USER P/W

⑦ send data to google sheet ✓

(non-free license → can receive data back from sheet)



⑧ in Google sheet script

- receive data from ESP-32

- write received data to sheet at desired cells

now - You can share your sheet to display your data

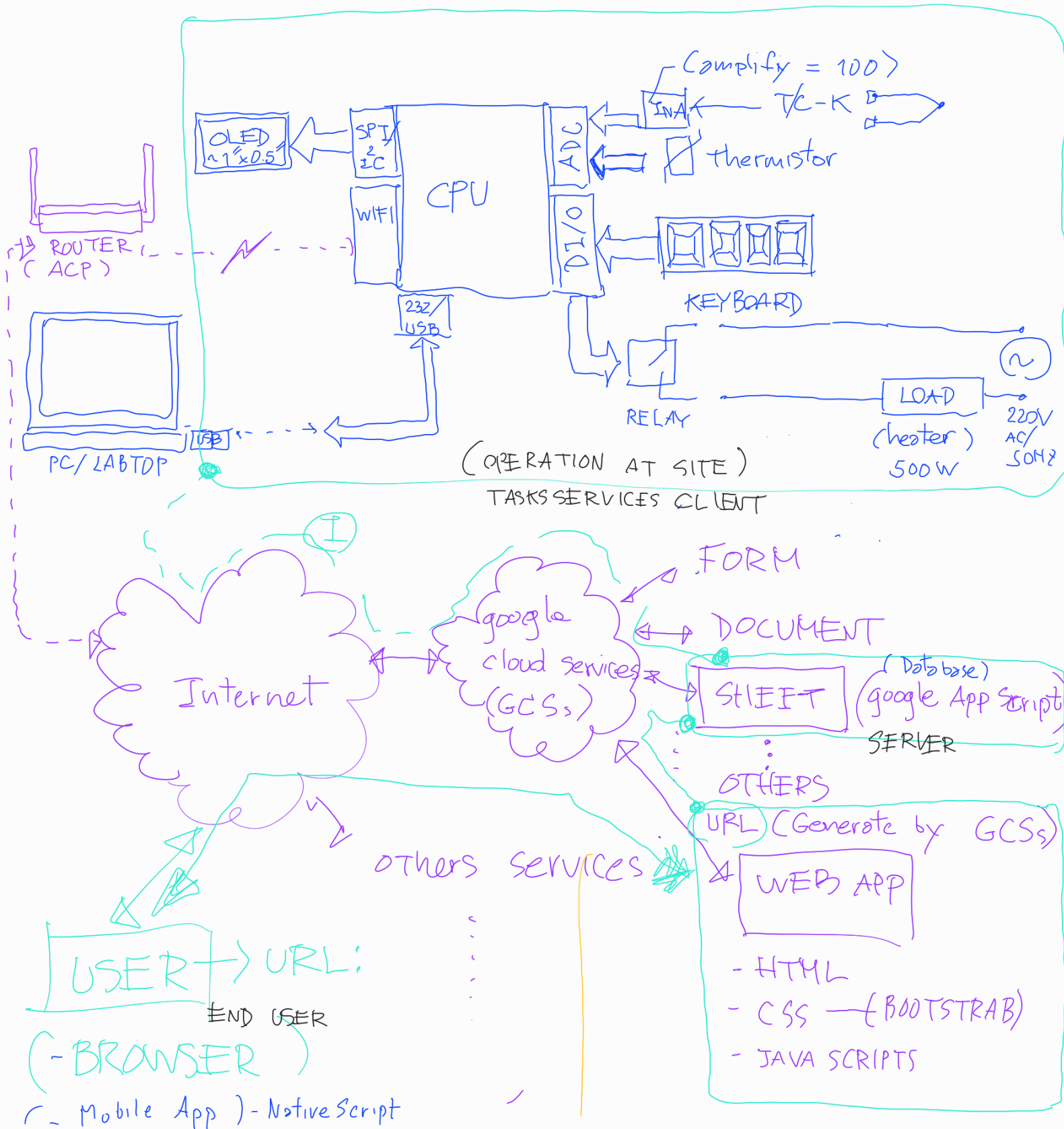
weight 70%

⑨ Build HTML web-app.

(CSS, JS) → to read data from table (sheet)

weight 100%

Block diagram (system diagram) (30-AUG-21)



IoT Algorithm (Programming Process, flow chart)

GCS.

ESP-32

(task services)
client
(c++ programming)

Sheet (server)

(data base)

G-App scripts
(programming)

(end user)
HTML + CSS
(interface) (beauty + animation)

+ JS
(programming, control)

① WIFI connect
hotspot (router,
access point)
(WIFI.h)

② connect database
(google sheet)
(HTTPClient.h)
GET, POST
(URL)

③ send data (temperature
values) to database
(GET)

④ receive data
from database
(sheet)

⑤ do any tasks

① GET response (doGET())
(response client
request)

①.5 POST response (doPOST())

② receive temperature
values and write
to the specific cell
on sheet

③ return any information
from sheet
to client request

(blocked
for free users)
↑

① connect sheet

② send data to sheet
(write)

(read)
③ receive data from
sheet

④ do any tasks