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Course: Embedded System

Q: 01) Design an embedded system which control the LED and a 90 watt bulb through web server physical which is interface with Arduino UNO along with Ethernet shield. Following web page is example like control the LED so in this you needs to add one more option for bulb.

Arduino IDE Image Output:


```
assignment4 | Arduino IDE 2.2.1

File  Edit  Sketch  Tools  Help

   Arduino Uno

assignment4.ino

1    #include <EtherCard.h>
2    static byte mymac[] = {  0xDE, 0xAD, 0xBE, 0xEF, 0xFE, 0xED };
3    byte Ethernet::buffer[700];
4
5    void setup() {
6      Serial.begin(9600);
7      Serial.println("\n[myServer]");
8
9      if (ether.begin(sizeof Ethernet::buffer, mymac, SS) == 0)
10       Serial.println("Failed to access Ethernet controller");
11
12     static byte myip[] = {192,168,1,200};
13     static byte gwip[] = {192,168,3,1};
14     static byte dnsip[] = {192,168,1,1};
15     ether.staticSetup(myip, gwip, dnsip);
16
17     ether.printIp("IP: ", ether.myip);
18     ether.printIp("GW: ", ether.gwip);
19     ether.printIp("DNS: ", ether.dnsip);

Output

Sketch uses 8486 bytes (26%) of program storage space. Maximum is 32256 bytes.
Global variables use 1332 bytes (65%) of dynamic memory, leaving 716 bytes for local variables. Maximum is 2048 bytes.

                                                             Ln 15, Col 40   Arduino Uno [not connected]
```
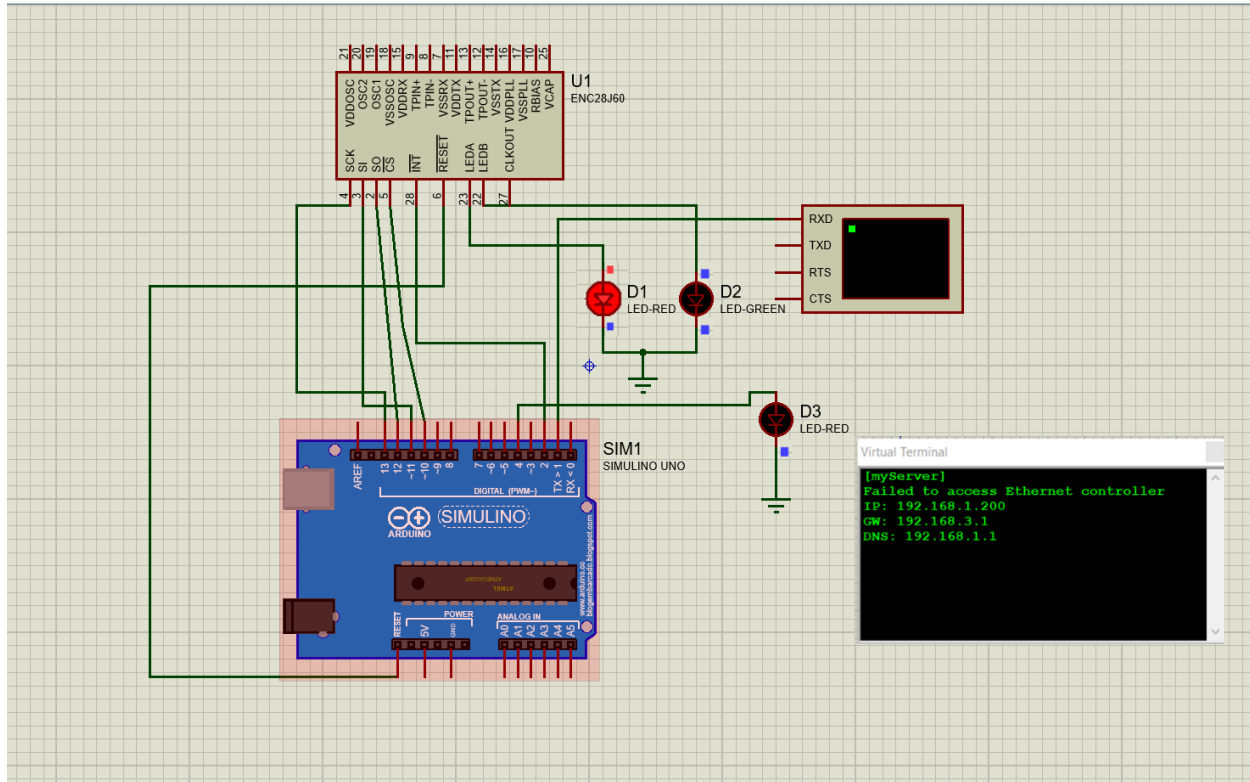
Proteus Image Output:

Solution:

```cpp
#include <EtherCard.h>
static byte mymac[] = {  0xDE, 0xAD, 0xBE, 0xEF, 0xFE, 0xED };
byte Ethernet::buffer[700];

void setup() {
  Serial.begin(9600);
  Serial.println("\n[myServer]");

  if (ether.begin(sizeof Ethernet::buffer, mymac, SS) == 0)
    Serial.println("Failed to access Ethernet controller");

  static byte myip[] = {192,168,1,200};
  static byte gwip[] = {192,168,3,1};
  static byte dnsip[] = {192,168,1,1};
  ether.staticSetup(myip, gwip, dnsip);

  ether.printIp("IP: ", ether.myip);
  ether.printIp("GW: ", ether.gwip);
  ether.printIp("DNS: ", ether.dnsip);

  if (!ether.dnsLookup("google.com"))
    Serial.println("DNS failed");
}

void loop() {
  ether.packetLoop(ether.packetReceive());

  word len = ether.packetReceive();
  word pos = ether.packetLoop(len);

  if (len > 0 && pos) {

    if (strstr((char *) Ethernet::buffer + pos, "GET /?led=on")) {
      digitalWrite(13, HIGH);
      Serial.println("LED turned ON.");
    } else if (strstr((char *) Ethernet::buffer + pos, "GET /?led=off")) {
      digitalWrite(13, LOW);
      Serial.println("LED turned OFF.");
    }

    const char httpResponse[] PROGMEM = "HTTP/1.1 200 OK\r\nContent-Type:
text/html\r\n\r\n<h1>Arduino Web Server</h1><a href=\"/?led=on\">Turn On
LED</a><br><a href=\"/?led=off\">Turn Off LED</a><br>";
```

```
    memcpy(Ethernet::buffer, httpResponse, sizeof(httpResponse));

    ether.httpServerReply(sizeof(httpResponse) - 1);
  }
}
```