

# Transfer Wi-Fi credentials over BLE and connect to Wi-Fi using ESP32 Devkit V1

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## Task Details

Transfer Wi-Fi credentials over Bluetooth and connect to Wi-Fi using a smartphone to send the credentials.

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## Hardware Components Used

1. Espressif System's ESP32 Devkit V1 Development Board
  2. USB to MicroUSB Cable
  3. Breadboard
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## Tools Used

### Arduino IDE

Arduino Integrated Development Environment or Arduino Software (IDE) contains a text editor for writing code, a message area, a text console, a toolbar with buttons for common functions,

and a series of menus. It connects to the Arduino hardware to upload programs and communicate with them.

- For more details, refer to: [Arduino IDE](#)
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## Microcontroller Interfacing

- **BLE Protocol:** Used for connectivity with the nRF Connect Mobile Application.
  - **Wi-Fi Protocol:** Used to connect the microcontroller to the WLAN network.
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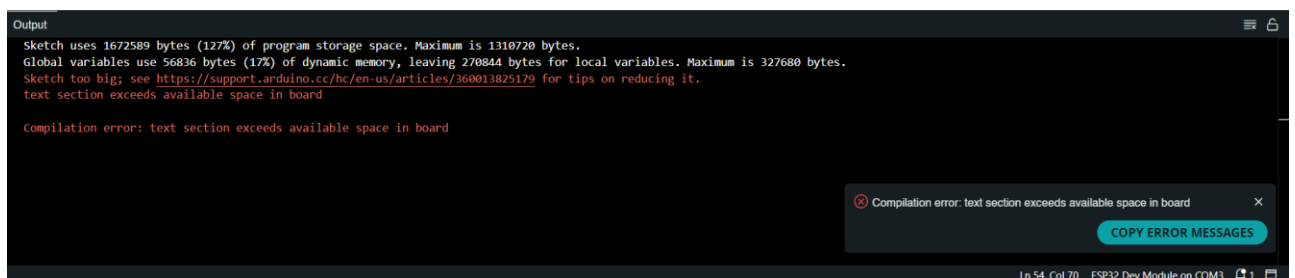
## Firmware

Link: [Firmware .ino File](#)

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## Issues Faced and Resolution

### Space Problem in the ESP32 Devkit V1 Board



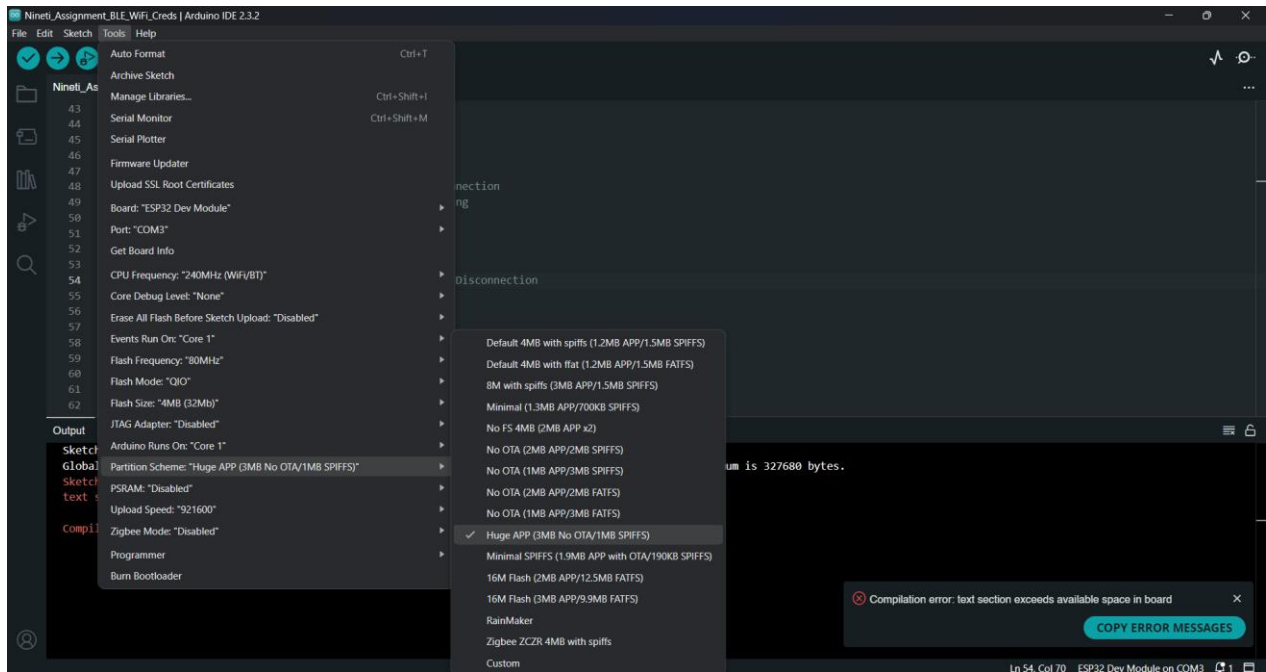
```
Output
Sketch uses 1672589 bytes (127%) of program storage space. Maximum is 1310720 bytes.
Global variables use 56836 bytes (17%) of dynamic memory, leaving 270844 bytes for local variables. Maximum is 327680 bytes.
Sketch too big; see https://support.arduino.cc/hc/en-us/articles/360013825179 for tips on reducing it.
text section exceeds available space in board

Compilation error: text section exceeds available space in board

[Error Message Box: Compilation error: text section exceeds available space in board]
[Button: COPY ERROR MESSAGES]
Ln 54, Col 70  ESP32 Dev Module on COM3 1
```

#### Approach 1:

- **Changed the board type to ESP32 Dev Module** (as both could be used for uploading the code, i.e., they have the same ESP32-WROOM chip).
- **Result:** Same error.
- **Comment:** There was the same amount of space in both development boards (same program and flash memory).

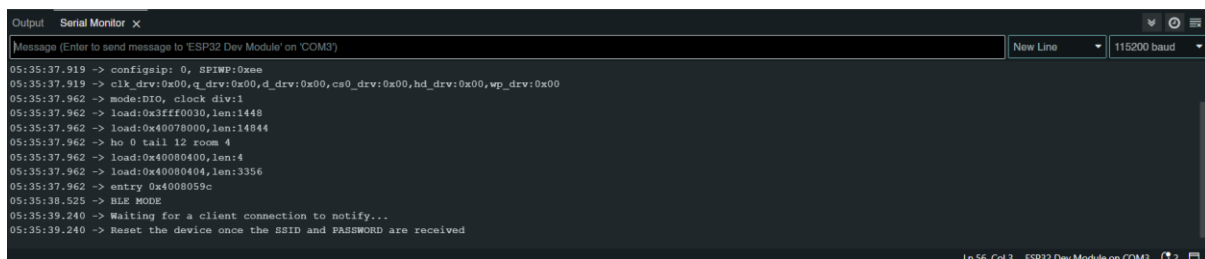


## Approach 2:

- **Changed the board type to ESP32 Dev Module and switched the "Partition Scheme" setting in tools to "Huge APP (3MB No OTA/1MB SPIFFS)".**
- **Result: This resolved the compilation error and uploaded properly onto the board successfully.**
- **Comment: There is a lot of space available in the board memory, but it has different default partitions preset which can be changed as per use case.**

## Outputs

### Serial Monitor Messages



```
Output Serial Monitor X
Message (Enter to send message to 'ESP32 Dev Module' on 'COM3')
New Line 115200 baud

05:35:37.919 -> clk_drv:0x00,q_drv:0x00,d_drv:0x00,cs0_drv:0x00,hd_drv:0x00,wp_drv:0x00
05:35:37.962 -> mode:DIO, clock div:1
05:35:37.962 -> load:0x3fff0030,len:1448
05:35:37.962 -> load:0x40078000,len:14844
05:35:37.962 -> ho 0 tail 12 room 4
05:35:37.962 -> load:0x40080400,len:4
05:35:37.962 -> load:0x40080404,len:3356
05:35:37.962 -> entry 0x4008059c
05:35:38.525 -> BLE MODE
05:35:39.240 -> Waiting for a client connection to notify...
05:35:39.240 -> Reset the device once the SSID and PASSWORD are received
05:35:55.494 -> Device Connected
```

```
Output Serial Monitor X
Message (Enter to send message to 'ESP32 Dev Module' on 'COM3')
New Line 115200 baud

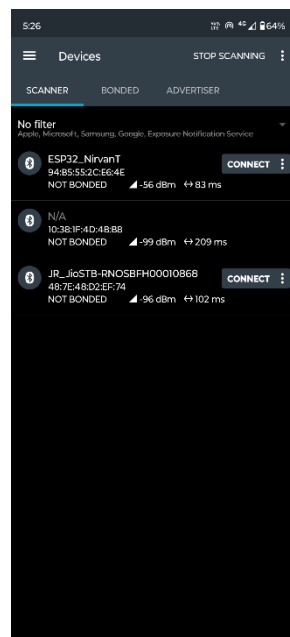
05:35:37.962 -> load:0x3fff0030,len:1448
05:35:37.962 -> load:0x40078000,len:14844
05:35:37.962 -> ho 0 tail 12 room 4
05:35:37.962 -> load:0x40080400,len:4
05:35:37.962 -> load:0x40080404,len:3356
05:35:37.962 -> entry 0x4008059c
05:35:38.525 -> BLE MODE
05:35:39.240 -> Waiting for a client connection to notify...
05:35:39.240 -> Reset the device once the SSID and PASSWORD are received
05:35:55.494 -> Device Connected
05:37:00.478 -> SSID,PASSWORD: Nirvan, nirvan007
05:37:00.478 -> Reset Device to connect to Wifi
```

```
Output Serial Monitor X
Message (Enter to send message to 'ESP32 Dev Module' on 'COM3')
New Line 115200 baud

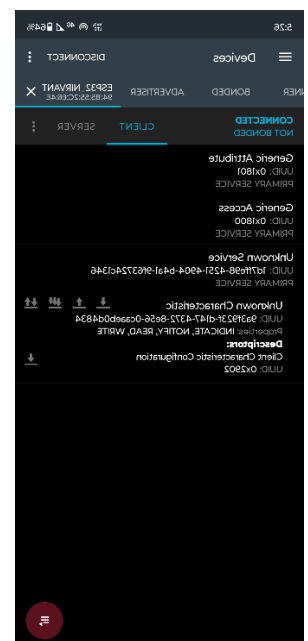
05:39:01.403 -> mode:DIO, clock div:1
05:39:01.403 -> load:0x3fff0030,len:1448
05:39:01.437 -> load:0x40078000,len:14844
05:39:01.437 -> ho 0 tail 12 room 4
05:39:01.437 -> load:0x40080400,len:4
05:39:01.437 -> load:0x40080404,len:3356
05:39:01.437 -> entry 0x4008059c
05:39:01.997 -> WIFI MODE
05:39:02.035 -> WifiName : Nirvan
05:39:02.035 -> wifiPassword : nirvan007
05:39:02.153 -> Connecting to Wifi
05:39:02.427 -> Connected with IP: 192.168.105.252
```

## nRF Connect Application interface

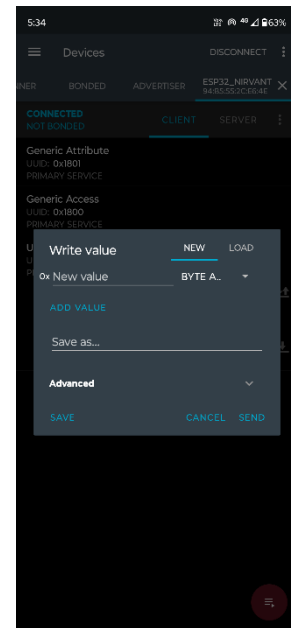
Connecting to the ESP32 Board



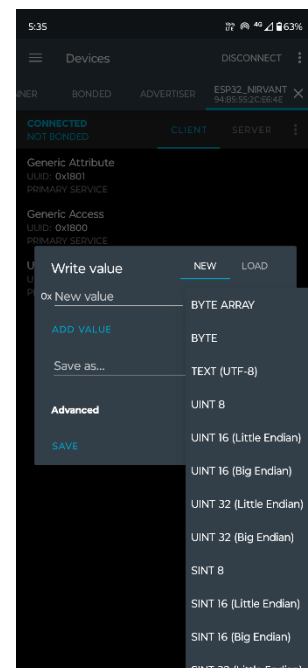
Opening the User-Created Unknown Service



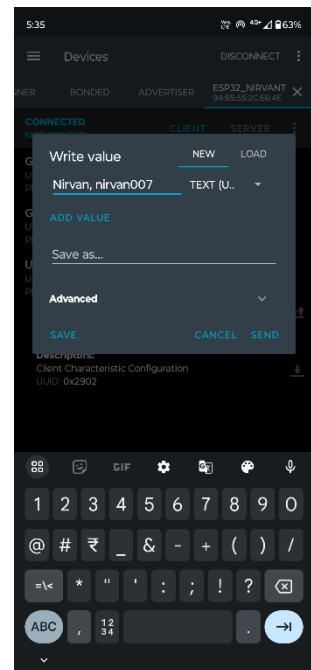
**Writing to the Board by Using the "Upward Arrow" in the Characteristic which Denotes the "Write" Command**



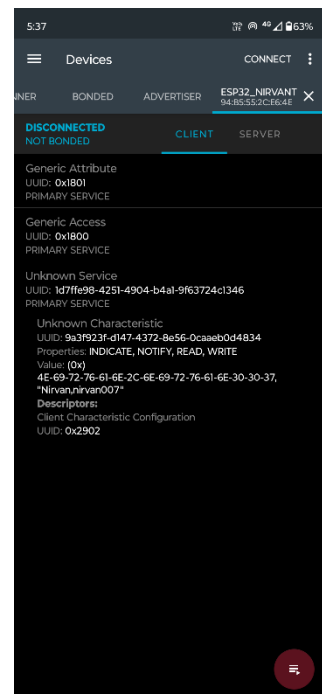
**Setting the "Write Value" to "TEXT(UTF-8)" to Send a String Value to the Board**



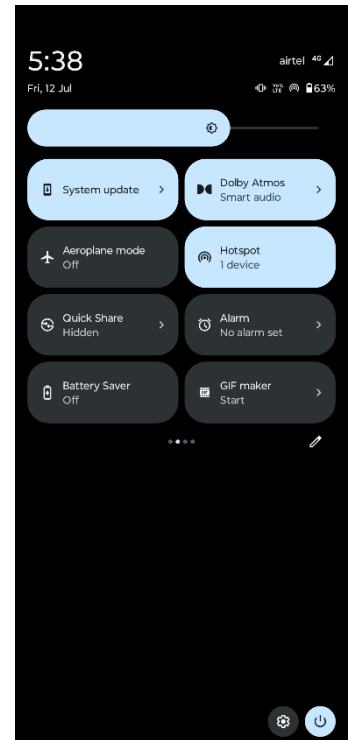
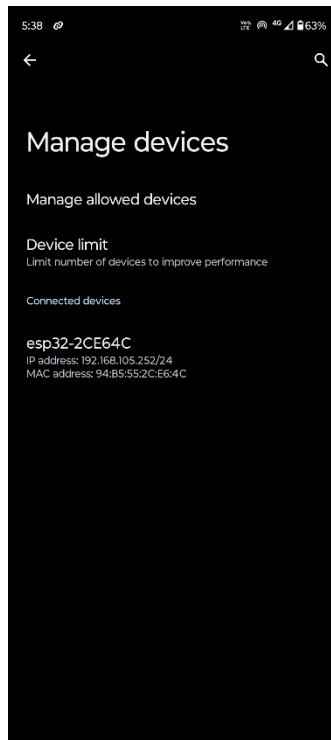
Typing the Wi-Fi SSID and Password in the Format:  
"SSID,PASS" and Clicking Send



Value is Being Written to the board



The Device Receives the SSID and Password, then it has to be Reset so that it can Turn OFF the BLE and Connect to the Provided Wi-Fi SSID



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## References

1. [Random Nerd Tutorials: ESP32 Wi-Fi Provisioning BLE Arduino](#)
2. [iOS Bluetooth ESP32 WiFi](#)
3. [EspBlufiForAndroid Releases](#)
4. [ThatProject: Esp32\\_wifi\\_ssid\\_pw\\_via\\_ble](#)
5. [Arduino Stack Exchange: Text Section Exceeds Available Space in Board](#)
6. [ESP32 Forum: View Topic](#)

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