

Physical Computing 101: Part I

Control of Mobile Robots: Hardware Lecture #5



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BeagleBone Black 1 GHz performance ready to use for \$45

10/100 Ethernet

USB Host

Easily connects to almost any everyday device such as mouse or keyboard

microHDMI

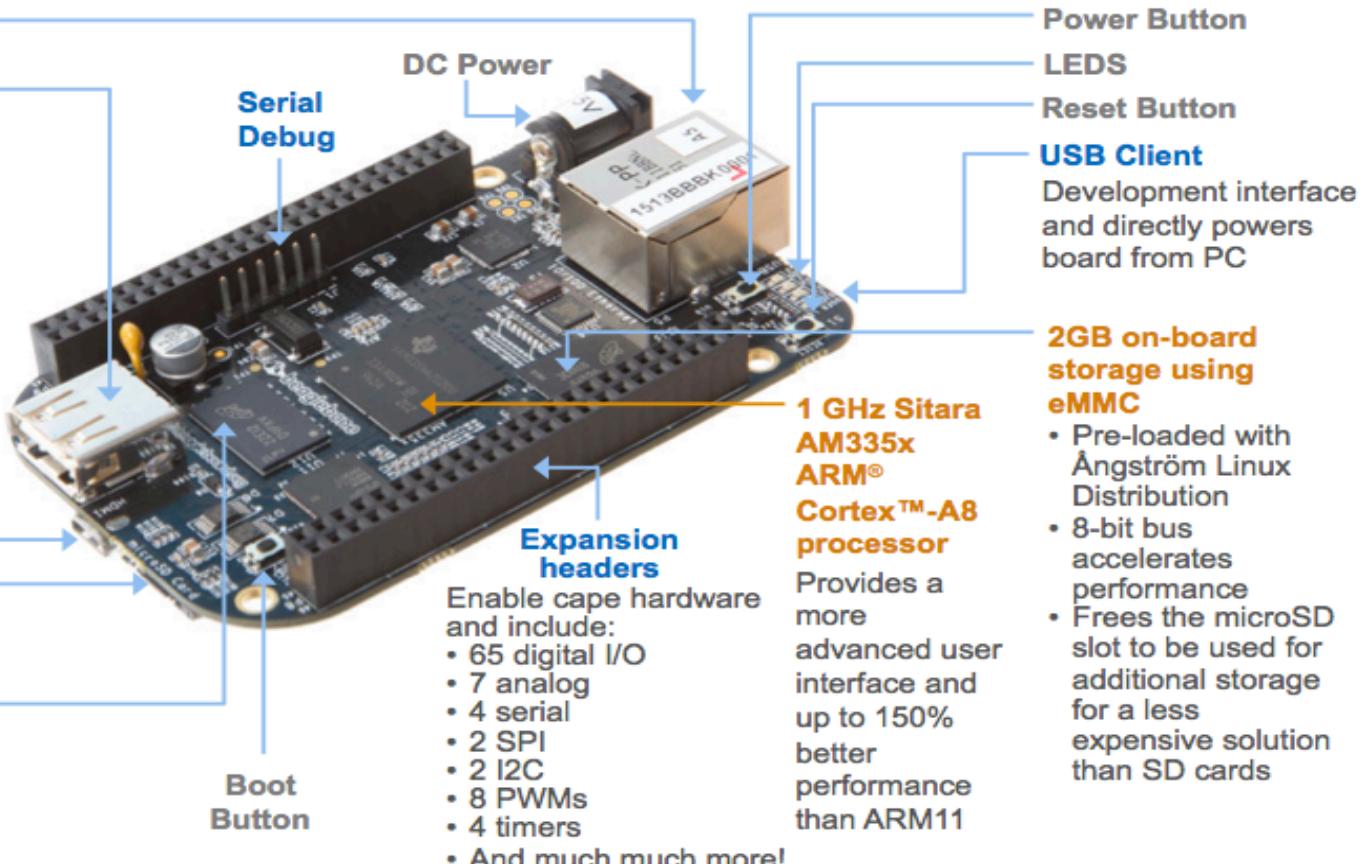
Connect directly to monitors and TVs

microSD

Expansion slot for additional storage

512MB DDR3

Faster, lower power RAM for enhanced user-friendly experience



Included in price:

- Power supply ~ \$10
- USB network cable ~ \$3

- 2GB on-board storage \$5-\$10
- PRU for real-time tasks typically on FPGA ~ \$20

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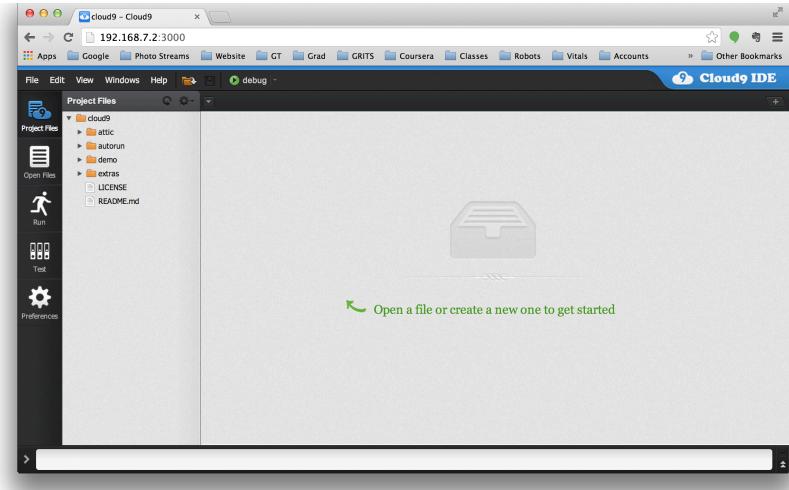
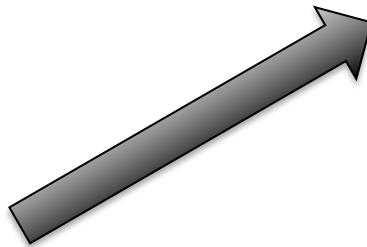
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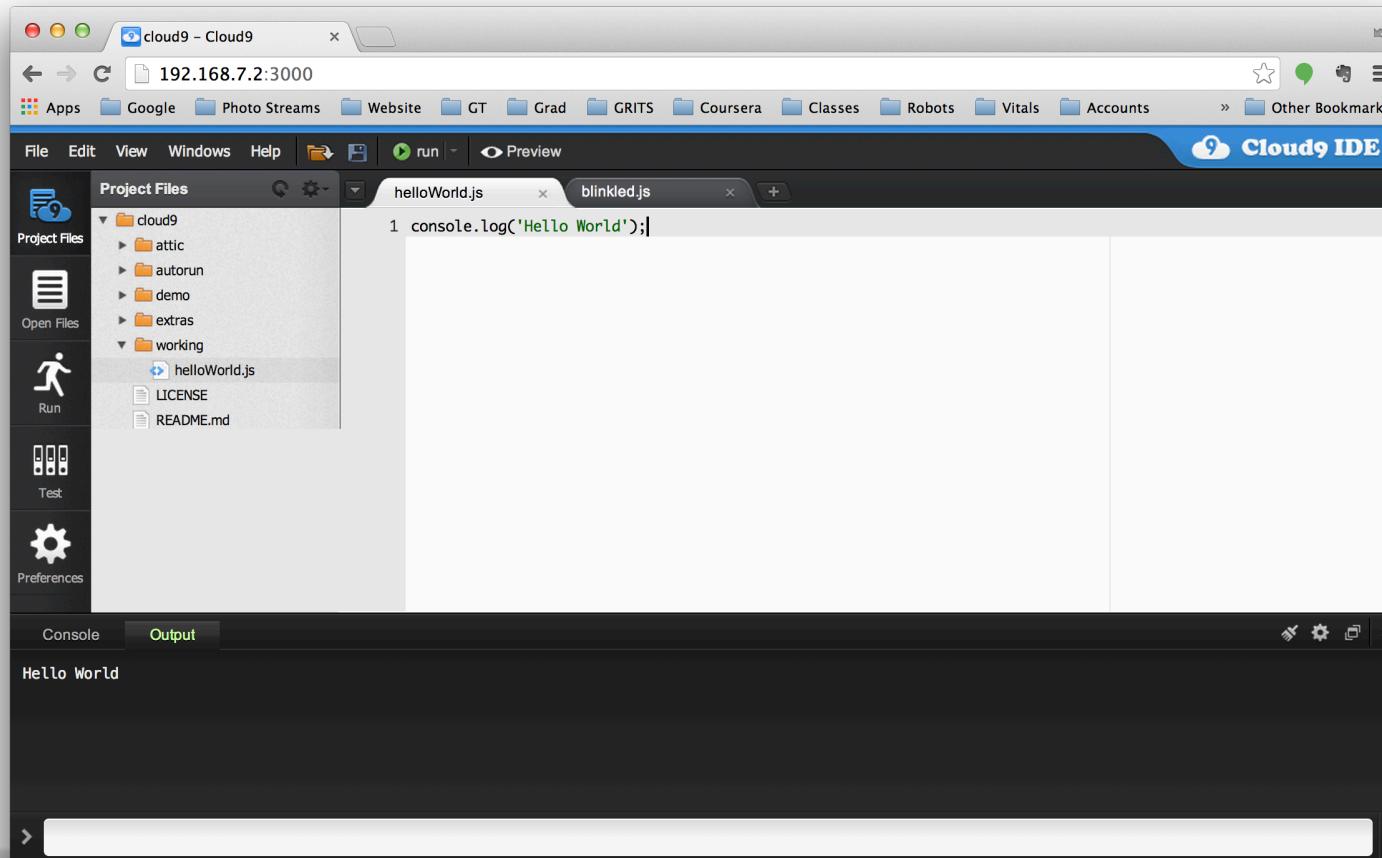
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Running Code On BBB

In browser enter:
<http://192.168.7.2:3000/>



BBB “Hello World”



BBB Blink LED

The screenshot shows the Cloud9 IDE interface. The browser tab is titled "cloud9 - Cloud9" and the address bar shows "192.168.7.2:3000". The menu bar includes File, Edit, View, Windows, Help, run, and Preview. The toolbar has icons for Apps, Google, Photo Streams, Website, GT, Grad, GRITS, Coursera, Classes, Robots, Vitals, Accounts, and Other Bookmarks. The left sidebar has Project Files, Open Files, Run, Test, and Preferences. The main area shows a "Project Files" tree with "cloud9" expanded, containing "attic", "autorun", and "demo". Inside "demo", files "analog.js", "analog2.js", "blinkled.js" (selected), "fade.js", and "input.js" are listed. The code editor window displays the "blinkled.js" file:

```
1 var b = require('bonescript');
2
3 var ledPin = "P8_13";
4 var ledPin2 = "USR3";
5
6 b.pinMode(ledPin, b.OUTPUT);
7 b.pinMode(ledPin2, b.OUTPUT);
8
9 var state = b.LOW;
10 b.digitalWrite(ledPin, state);
11 b.digitalWrite(ledPin2, state);
12
13 setInterval(toggle, 1000);
14
15 function toggle() {
16     if(state == b.LOW) state = b.HIGH;
17     else state = b.LOW;
18     b.digitalWrite(ledPin, state);
19     b.digitalWrite(ledPin2, state);
20 }
```

The bottom tabs show "Console" and "Output", with "Hello World" in the console.