CPE403 – Advanced Embedded Systems

Design Assignment 6

DO NOT REMOVE THIS PAGE DURING SUBMISSION:

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Github Repository link (root): https://github.com/PeppersJ/v4e0nk_i3

Youtube Playlist link (root): https://www.youtube.com/watch?v=_k2tUw0Yhl8&list=PL0YkZgBDuZhsaqMwPyAYErFGDuP_Jo_ei&index=1

Follow the submission guideline to be awarded points for this Assignment.

Submit the following for all Assignments:

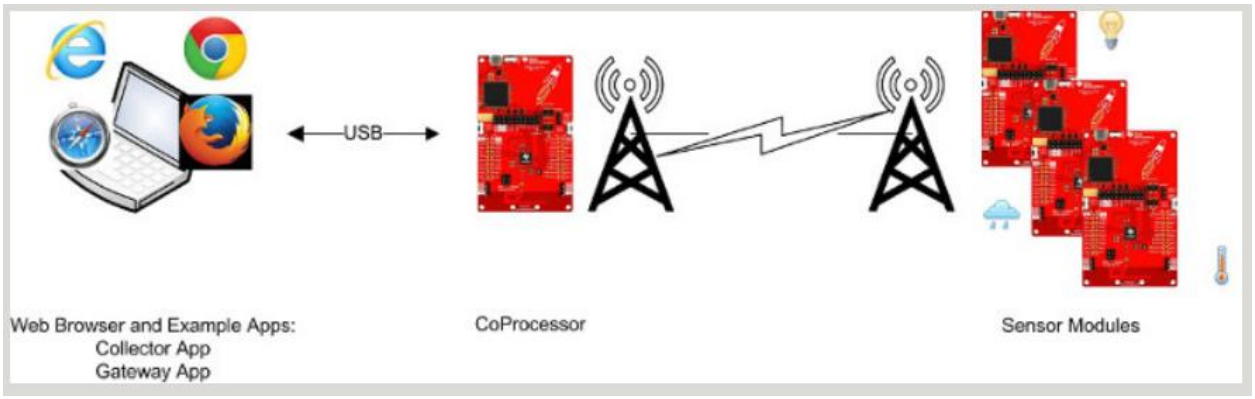
1. In the document, for each task submit the modified or included code (from the base code) with highlights and justifications of the modifications. Also include the comments. If no base code is provided, submit the base code for the first task only.
2. Create a private Github repository with a random name (no CPE/403, Lastname, Firstname). Place all labs under the root folder TIVAC, sub-folder named Assignment1, with one document and one video link file for each lab, place modified c files named as asng_taskxx.c.
3. If multiple c files or other libraries are used, create a folder asng1_t01 and place these files inside the folder.
4. The folder should have a) Word document (see template), b) source code file(s) with startup_ccs.c and other include files, c) text file with youtube video links (see template).
5. Submit the doc file in canvas before the due date. The root folder of the github assignment directory should have the documentation and the text file with youtube video links.
6. Organize your youtube videos as playlist under the name “cpe403”. The playlist should have the video sequence arranged as submission or due dates.
7. Only submit pdf documents. Do not forget to upload this document in the github repository and in the canvas submission portal.

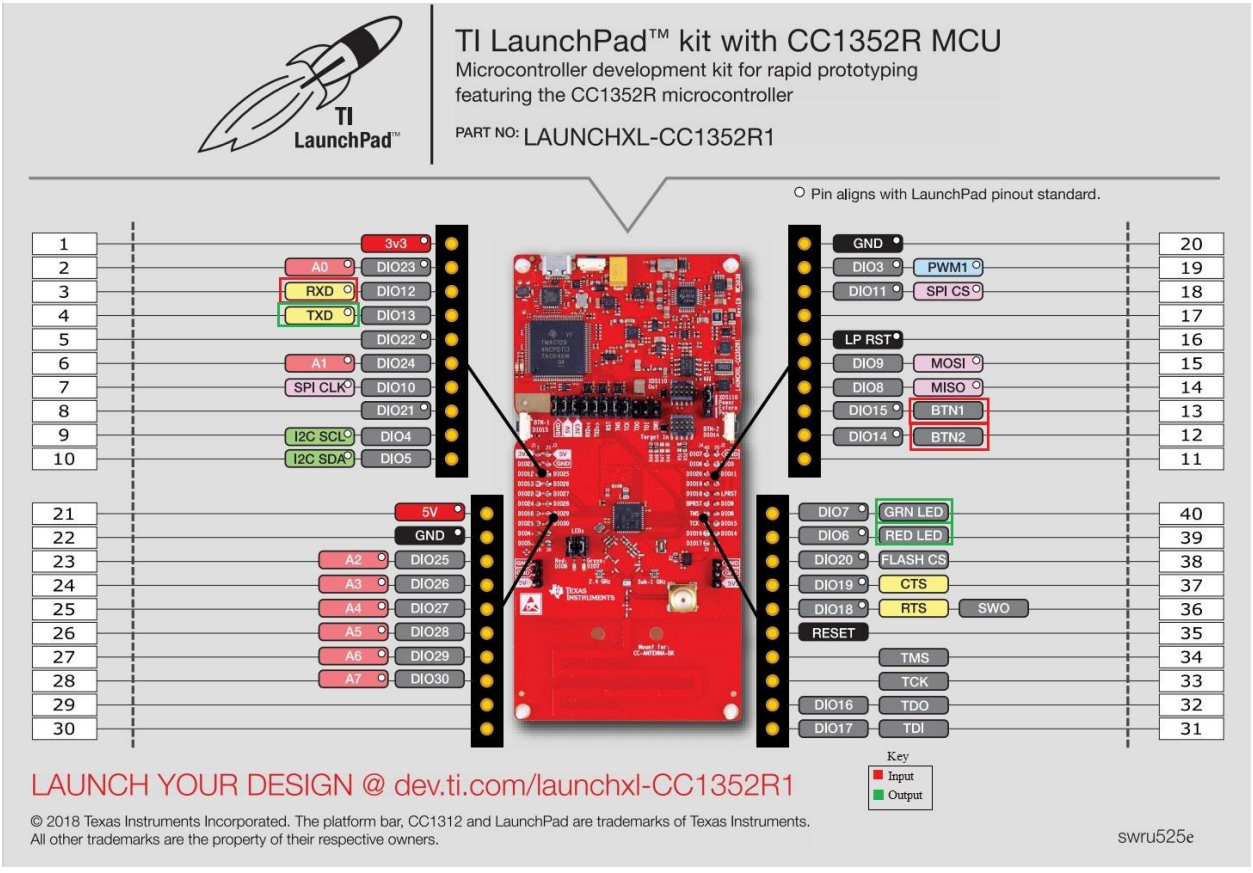
1. Code for Tasks. for each task submit the modified or included code (from the base code) with highlights and justifications of the modifications. Also include the comments. If no base code is provided, submit the base code for the first task only. Use separate page for each task.

Sensor sensor.opts:

```
-DLPSTK
-DTEMP_SENSOR
-DxAUTO_START
```

2. Block diagram and/or Schematics showing the components, pins used, and interface.

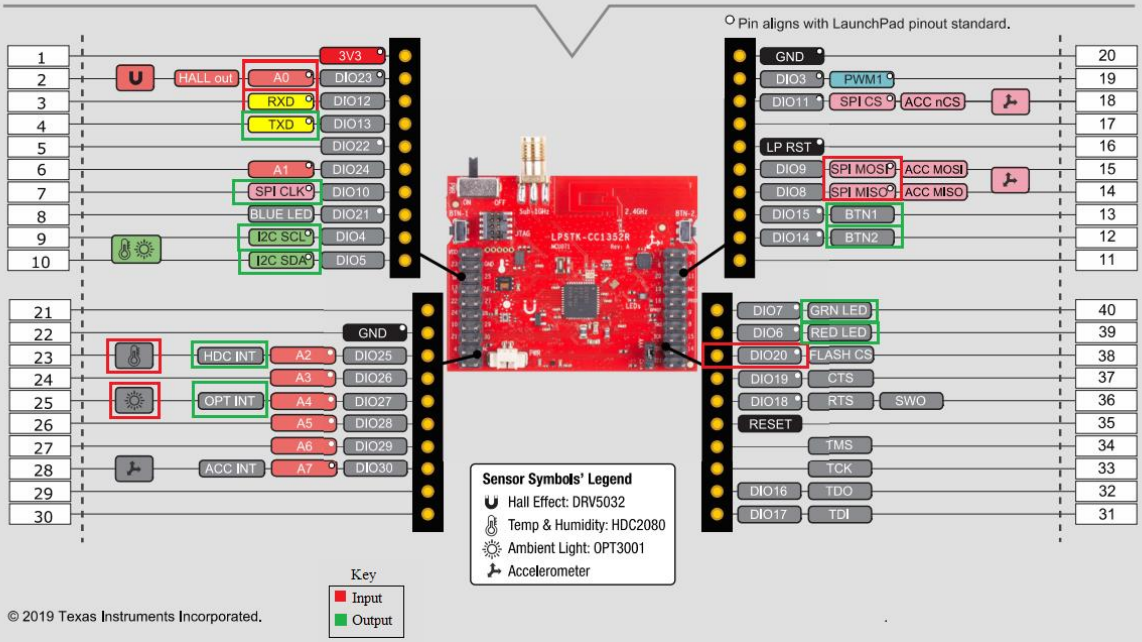




TI LaunchPad™ SensorTag kit with SimpleLink™ Wireless MCU

Low-power wireless sensor kit featuring the multi-band CC1352R MCU

PART NO: LPSTK-CC1352R



3. Screenshots of the IDE, physical setup, debugging process - Provide screenshot of successful compilation, screenshots of registers, variables, graphs, etc.

Co-Processor

```
CDT Build Console [coprocessor_CC1352R1_LAUNCHXL_tirtos_ccs]
Building file: "../software_stack/ti15_4stack/services/nvocmp.c"
Invoking: ARM Compiler
"W:/Programs/ti/ccs1011/ccs/tools/compiler/ti-cgt-arm_20.2.3.LTS/bin/armcl" --cmd_file="W:/CCS_Projects/coprocessor_CC1352R1_LAUNCHXL_tirtos_ccs/application/defines/coprocessor.opts"  -mv7M4 --cod
Finished building: "../software_stack/ti15_4stack/services/nvocmp.c"

making ../src/sysbios/rom_sysbios.aem4f ...
gmake[2]: Nothing to be done for 'all'.
Building target: "coprocessor_CC1352R1_LAUNCHXL_tirtos_ccs.out"
Invoking: ARM Linker
"W:/Programs/ti/ccs1011/ccs/tools/compiler/ti-cgt-arm_20.2.3.LTS/bin/armcl" --cmd_file="W:/CCS_Projects/coprocessor_CC1352R1_LAUNCHXL_tirtos_ccs/application/defines/coprocessor.opts"  -mv7M4 --cod
<Linking>
Finished building target: "coprocessor_CC1352R1_LAUNCHXL_tirtos_ccs.out"

W:/Programs/ti/ccs1011/ccs/tools/compiler/ti-cgt-arm_20.2.3.LTS/bin/armhex -order MS --memwidth=8 --romwidth=8 --intel -o coprocessor_CC1352R1_LAUNCHXL_tirtos_ccs.hex coprocessor_CC1352R1_LAUNCHXL_
Translating to Intel format...
   "coprocessor_CC1352R1_LAUNCHXL_tirtos_ccs.out" .resetVecs ==> .resetVecs
   "coprocessor_CC1352R1_LAUNCHXL_tirtos_ccs.out" .const ==> .const
   "coprocessor_CC1352R1_LAUNCHXL_tirtos_ccs.out" config_const ==> config_const
   "coprocessor_CC1352R1_LAUNCHXL_tirtos_ccs.out" .text.1 ==> .text.1
   "coprocessor_CC1352R1_LAUNCHXL_tirtos_ccs.out" .cinit ==> .cinit
   "coprocessor_CC1352R1_LAUNCHXL_tirtos_ccs.out" .text.2 ==> .text.2
   "coprocessor_CC1352R1_LAUNCHXL_tirtos_ccs.out" .ccfg ==> .ccfg


**** Build Finished ****
```

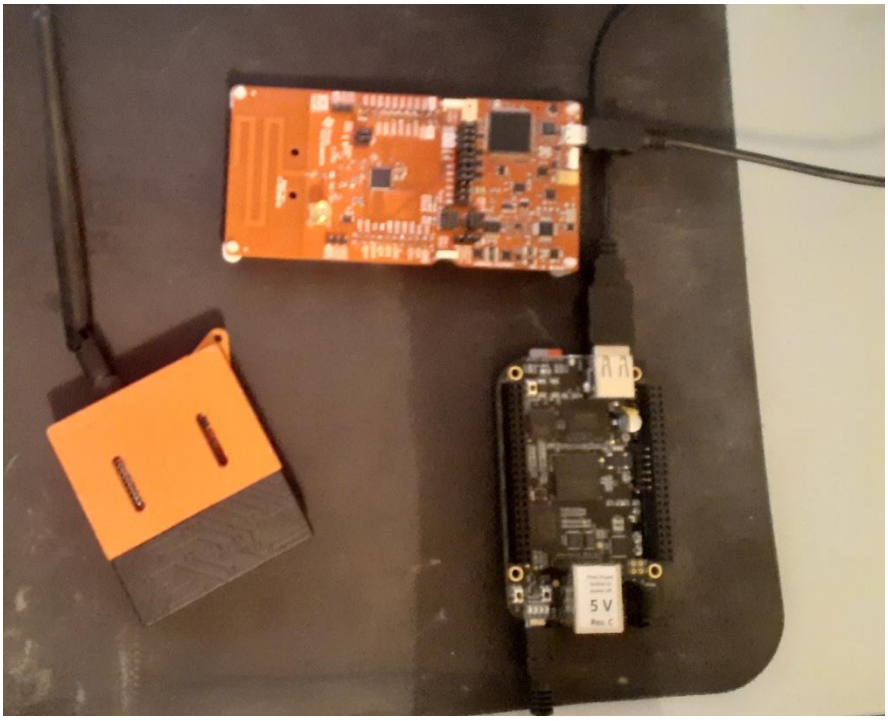
Sensor

```
CDT Build Console [Assignment_5_sensor_CC1352R1_LAUNCHXL_tirtos_ccs]
Building file: "../software_stack/ti15_4stack/services/nvocmp.c"
Invoking: ARM Compiler
"W:/Programs/ti/ccs1011/ccs/tools/compiler/ti-cgt-arm_20.2.3.LTS/bin/armcl" --cmd_file="W:/CCS_Projects/Assignment_5_sensor_CC1352R1_LAUNCHXL_tirtos_ccs/application/defines/sensor.opts"  -mv7M4 --
Finished building: "../software_stack/ti15_4stack/services/nvocmp.c"

making ../src/sysbios/rom_sysbios.aem4f ...
gmake[2]: Nothing to be done for 'all'.
Building target: "Assignment_5_sensor_CC1352R1_LAUNCHXL_tirtos_ccs.out"
Invoking: ARM Linker
"W:/Programs/ti/ccs1011/ccs/tools/compiler/ti-cgt-arm_20.2.3.LTS/bin/armcl" --cmd_file="W:/CCS_Projects/Assignment_5_sensor_CC1352R1_LAUNCHXL_tirtos_ccs/application/defines/sensor.opts"  -mv7M4 --
<Linking>
Finished building target: "Assignment_5_sensor_CC1352R1_LAUNCHXL_tirtos_ccs.out"

W:/Programs/ti/ccs1011/ccs/tools/compiler/ti-cgt-arm_20.2.3.LTS/bin/armhex -order MS --memwidth=8 --romwidth=8 --intel -o Assignment_5_sensor_CC1352R1_LAUNCHXL_tirtos_ccs.hex Assignment_5_sensor_C
Translating to Intel format...
   "Assignment_5_sensor_CC1352R1_LAUNCHXL_tirtos_ccs.out" .resetVecs ==> .resetVecs
   "Assignment_5_sensor_CC1352R1_LAUNCHXL_tirtos_ccs.out" .const ==> .const
   "Assignment_5_sensor_CC1352R1_LAUNCHXL_tirtos_ccs.out" config_const ==> config_const
   "Assignment_5_sensor_CC1352R1_LAUNCHXL_tirtos_ccs.out" .text.1 ==> .text.1
   "Assignment_5_sensor_CC1352R1_LAUNCHXL_tirtos_ccs.out" .cinit ==> .cinit
   "Assignment_5_sensor_CC1352R1_LAUNCHXL_tirtos_ccs.out" .text.2 ==> .text.2
   "Assignment_5_sensor_CC1352R1_LAUNCHXL_tirtos_ccs.out" .ccfg ==> .ccfg


**** Build Finished ****
```



```
hoflick@hoflick-VirtualBox:~$ ssh debian@192.168.7.2
Debian GNU/Linux 10

BeagleBoard.org Debian Buster IoT Image 2020-04-06

Support: http://elinux.org/Beagleboard:BeagleBoneBlack_Debian

default username:password is [debian:temppwd]

debian@192.168.7.2's password:

The programs included with the Debian GNU/Linux system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
Last login: Mon Apr  6 16:34:28 2020 from 192.168.7.1
debian@beaglebone:~$ cd prebuilt
debian@beaglebone:~/prebuilt$ sudo ./run_demo.sh
```

TI-15.4 Stack Example Application - Collector App

Network Information

PanID	0xACDC
Coord Addr	0xAABB
Network Mode	Non Beacon
Security	Enabled
Network close for New Devices	open

Network

Sensor Nodes

Short Address	Ext Address	Sensors Data	RSSI	Toggle-Req
0x5	0x44258A9D974F9	13% RH 31°C 10lux	-19	ToggleLed

4. Declaration

I understand the Student Academic Misconduct Policy -
http://studentconduct.unlv.edu/misconduct/policy.html

"This assignment submission is my own, original work".
Rishawn Peppers Johnson