4357. Embedded Firmware Essentials

Homework #2 (Quiz 1 and Quiz 2)

Jae Yang Park ([jaeyangp@gmail.com](mailto:jaeyangp@gmail.com))

QUIZ#1

|  |
| --- |
| -------------------------------------------------------------------- |
| Q1: Is there any compile error with the following code (if any)? |
|  |
| unsigned int Arr[16]; |
| 3[Arr] = 7; |
|  |
| Explain: With gcc, there’s no compile error or warning.  Variable name shouldn’t be started number and number itself. |
|  |
|  |
|  |
|  |
| -------------------------------------------------------------------- |
| Q2: What is the difference between the following 3 statements? |
|  |
| const int \* px; px is pointer to int const |
| int const \* px; px is pointer to const int |
| int \* const px; px is const pointer to int |
|  |
| Is there any compile error for the following cases? |
| case1: no compile error |
| int x = 13; |
| const int \* px; |
| px = & x; |
|  |
| case 2: no compile error |
| int x = 13; |
| int const \* px; |
| px = & x; |
|  |
| case 3: compile error |
| int x = 13; |
| int \* const px; |
| px = & x; |
|  |
| Explain: px is const pointer to int. So, &x cannot be assigned to px. |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
| -------------------------------------------------------------------- |
| Q3: Write a function to set or clear ith bit of a 32-bit register. |
| Where ith (0-based) := {0, 1, 2, …, 31 } |
| void reg\_set(volatile unsigned int \* pReg, int ith) |
| {  \*pReg = \*pReg | (1 << ith); |
|  |
|  |
|  |
|  |
|  |
| } |
|  |
| void reg\_clear(volatile unsigned int \* pReg, int ith) |
| {  \*pReg = \*pReg & (~(1 << ith)); |
|  |
|  |
|  |
|  |
|  |
| } |
|  |
|  |
|  |
| -------------------------------------------------------------------- |
| Q4: Write a swap function in C. |
| void swap(unsigned int \* px, unsigned int \*py)  {  unsigned int ptemp;  ptemp = \*px;  \*px = \*py;  \*py = ptemp; |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
| } |
|  |
| -------------------------------------------------------------------- |
| Q5: What is the output of the following code? (Given: sizeof(unsigned int) is 4) Page 34 |
|  |
| unsigned int Arr[16]; |
| unsigned int a0 = (unsigned int) &Arr[0]; |
| unsigned int a3 = (unsigned int) &Arr[3]; |
| printf(“%d\n”, a3 – a0);  output:12 |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |

|  |
| --- |
| QUIZ #2  -------------------------------------------------------------------- |
| Q1: How many microcontrollers in the mbed LPC1768 board?  2 (Cortex-M3, Interface microcontroller) |
|  |
|  |
|  |
| -------------------------------------------------------------------- |
| Q2: What is the size (in GB) of the Flash Memory ("USB Dsik") of the LPC1768?  16Mbit = 2MB = 0.002GB |
|  |
|  |
|  |
|  |
| -------------------------------------------------------------------- |
| Q3: Name 3 functions (or features) that mbed USB cable provided: |
|  |
| 1. Power supply |
| 2. USB Disk |
| 3. Serial communication |
|  |
|  |
| -------------------------------------------------------------------- |
| Q4: What is the name of the Ethernet PHY chip in the mbed board (LPC1768)?  TI DP83848J |
|  |
|  |
|  |
|  |
|  |
| -------------------------------------------------------------------- |
| Q5: Reference LPC17xx\_UM10360.pdf (Chapter 2) |
| What are the GPIO address window?  0x2009 C000 – 0x2009 FFFF |
|  |
|  |
|  |
|  |
|  |