

4357. Embedded Firmware Essentials  
Homework #2 (Quiz 1 and Quiz 2)  
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QUIZ#1

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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.

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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.

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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);  
}
```

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Q4: Write a swap function in C.

```
void swap(unsigned int * px, unsigned int *py)  
{  
    unsigned int ptemp;  
    ptemp = *px;  
    *px = *py;  
    *py = ptemp;
```

```
}
```

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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

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Q1: How many microcontrollers in the mbed LPC1768 board?

2 (Cortex-M3, Interface microcontroller)

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Q2: What is the size (in GB) of the Flash Memory ("USB Dsik") of the LPC1768?

16Mbit = 2MB = 0.002GB

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Q3: Name 3 functions (or features) that mbed USB cable provided:

1. Power supply
2. USB Disk
3. Serial communication

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Q4: What is the name of the Ethernet PHY chip in the mbed board (LPC1768)?

TI DP83848J

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Q5: Reference LPC17xx\_UM10360.pdf (Chapter 2)

What are the GPIO address window?

0x2009 C000 - 0x2009 FFFF