Unit 1a
Numbers and Memory

Questions
‣ Which of the following statement(s) are true
• [R] memory stores Big Endian Integers
• [Y] memory stores bytes interpreted by the CPU as Big Endian Integers
• [G] Neither
• [B] I don’t know

A Quick C Primer

Interlude
Determining Endianness of a Computer

Back to Numbers ...
What is the value of i after this Java statement executes?

```java
int i = (byte)(0x8b) << 16;
```

- [R] 0x8b
- [Y] 0x0000008b
- [G] 0x008b0000
- [B] 0xff8b0000
- [R+Y] None of these
- [G+B] I don't know

**The Code You Will Implement**

```java
/**
 * Determine whether an address is aligned to specified length.
 * @param address a base memory address.
 * @param length byte length
 * @return true iff address is aligned to length
 */
protected boolean isAccessAligned (int address, int length) {
  return false;
}
/**
 * Determine the size of memory.
 * @return the number of bytes allocated to this memory.
 */
public int length () {
  return 0;
}

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**The Main Memory Class**

- **The SM213 simulator has two main classes**
  - CPU implements the fetch-execute cycle
  - MainMemory implements memory

- **The first step in building our processor**
  - Implement 6 main internal methods of MainMemory

- **In the Lab...**
  - write a C program to determine Endianness
    - prints “Little Endian” or “Big Endian”
    - get comfortable with Unix command line and tools (important)
  - compile and run this program on two architectures
    - IA32: lin01.ugrad.cs.ubc.ca
    - Sparc: any of the other undergrad machines
    - you can tell what type of arch you are on
      - `uname -a`
  - SimpleMachine simulator
    - load code into Eclipse and get it to build
    - write and test MainMemory.java
    - additional material available on the web page at lab time

- **The Code You Will Implement**

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