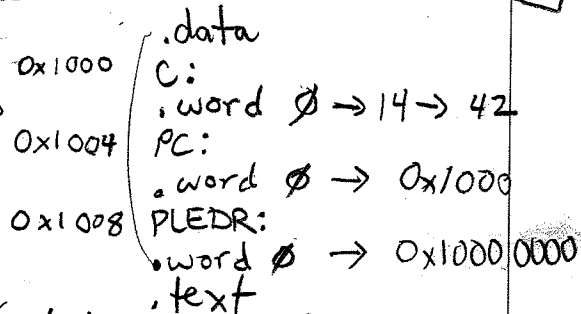


Programming In C

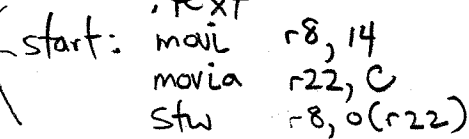
- 3 key things:
- ① & "address of" operator
 - ② * "value at" operator (pointer dereference)
 - ③ volatile forces use of ldwio/stwio instead of ldw/stw - this forces uncached memory accesses.

Example

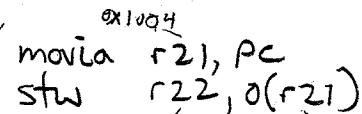
```
int c = 0;
int *pc = 0;
volatile unsigned int *PLEDR = 0;
```



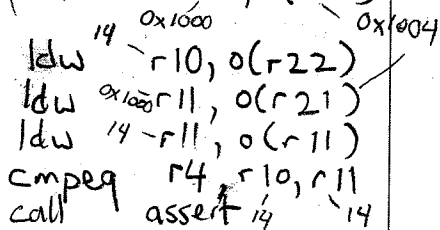
```
c = 14;
```



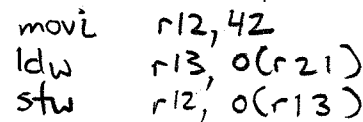
```
pc = &c;
```



```
assert(c == *pc);
```



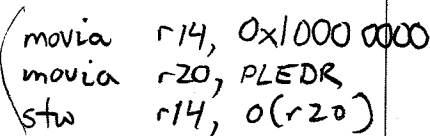
```
*pc = 42;
```



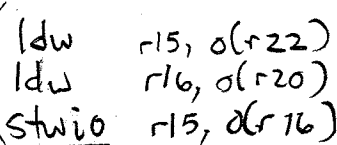
```
assert(c == *pc);
```

(r10=42, r11=42)

```
PLEDR = (unsigned int *) 0x1000 0000
```



```
*PLEDR = c;
```



volatile

Notice: use of "*" results in extra ldw
or "*"=" results in extra stw

UNIVERSITY OF BRITISH COLUMBIA
DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING
EECE 259: Introduction to Microcomputers
Practical Assignment 4: Project

Sample Proposal/Specification and Contract Form

Students: _____ and _____

Project Description

EXAMPLE: DE1 Alarm Clock

- HH:MM on hex display
- SW9=1 activates *test mode* that runs 60x faster, *i.e.* MM:SS on hex display
- SW8=1 buzzer (square or triangular waveform), SW8=0 music
- KEY1 advances minutes
- KEY2 advances hour
- KEY3 displays Alarm time
- Holding KEY3 and pressing KEY2 (hours) or KEY1 (minutes) sets Alarm time
- During Alarm, sound will play for 5 minutes (5 seconds in test mode), then quiet for 5 minutes, then play for 5 minutes, etc
- During Alarm, pressing KEY3 will snooze for 5 minutes (5 seconds in test mode)
- During Alarm, changing any SW from original position ends the Alarm

By signing below, the TA/instructor agrees that this proposal is complete, unambiguous, and of an appropriate level of difficulty to be solvable in time for PA4.

Signed: _____ Date: _____