CSE 30 – ARM ldr/str exercises

**1. What is the value of r0 after the following code? The operations are independent from each other. Assume r0 originally has 0xbeef1234**

**Memory**

ldr r1, =0xabcdef00

ldrh r0, [r1]

ldr r1, =0xabcdef00

ldrsh r0, [r1]

|  |  |
| --- | --- |
| **Address** | **Value** |
| 0xabcdef03 | **0xba** |
| 0xabcdef02 | **0xbe** |
| 0xabcdef01 | **0xfa** |
| 0xabcdef00 | **0xce** |

ldr r1, =0xabcdef00

ldr r0, [r1]

ldr r1, =0xabcdef00

ldrb r0, [r1, 3]

ldr r1, =0xabcdef02

ldrsh r0, [r1]

**2. What is the value of memory after the following code? The operations are independent from each other. Assume r0 originally has 0xbeef1234**

**Memory**

ldr r1, =0xabcdef00

strh r0, [r1, 2]

ldr r1, =0xabcdef00

str r0, [r1]

|  |  |
| --- | --- |
| **Address** | **Value** |
| 0xabcdef03 | **0xba** |
| 0xabcdef02 | **0xbe** |
| 0xabcdef01 | **0xfa** |
| 0xabcdef00 | **0xce** |

ldr r1, =0xabcdef02

strb r0, [r1, 1]

.cpu cortex-a53

.syntax unified

.arch armv6

3. Translate the following C code into ARM

//includes omitted

int x = 20;

int y;

char a[100];

int b[100];

int main(){

for(int i = 0; i < 100; ++i){

a[i] = i;

b[i] += a[i];

}