

CS520—Spring 2013—Homework 4
Wednesday February 20

Question 1

Encode the following vm520 instruction: *ldimm r7,-117*. Show your answer in hexadecimal and show all the hex digits, even if they are zero.

Question 2

Disassemble the following vm520 object file, which is shown using `od -tx1`:

```
0000000 05 00 00 00 00 00 00 00 05 00 00 00 61 6e 73 77
0000020 65 72 00 00 00 00 00 00 00 00 00 00 01 00 00 00
0000040 14 10 00 00 00 00 00 00 03 b0 12 00 02 d0 ff ff
0000060 00 00 00 00
0000064
```

Show any insymbols with their addresses. Show any outsymbols with their addresses. Interpret and display the object code simply as a sequence of instructions. Addresses in instructions should be displayed as absolute addresses in decimal. Constants or offsets in instructions should be displayed in decimal.

Question 3

Provide at least three interpretations for the following word in vm520 memory: *0x00008907*.

There is one more question on the next page.

Question 4

Show the result of linking together the following two object files. Show your result in the same format as the two input files are shown.

The object code for this file should be placed first in the output.

Insymbol Section (2 entries)

y 1
x 0

Outsymbol Section (0 entries)

Object Code (2 words)

```
0000000 00000013  beq      r0, r0, 1
0000001 00000017  getpn   r0
```

The object code for this file should be placed second in the output.

Insymbol Section (1 entries)

result 7

Outsymbol Section (3 entries)

z 3
y 1
x 0

Object Code (8 words)

```
0000000 00000001  load    r0, [undefined]
0000001 00000101  load    r1, [undefined]
0000002 0000100b  addi   r0, r1
0000003 00000101  load    r1, [undefined]
0000004 0000100b  addi   r0, r1
0000005 00001002  store  r0, 7
0000006 00000000  halt
0000007 00000000  halt
```