

This is a pen and paper exercise, write all answers on a piece of paper (yellow pad or bond paper), then submit a photo or scanned image of your answers.

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 Student Number: 2020-67013 & 2020-03671 Section: CD-1L

I. (0.5 pts each) Given the variable declarations below, write V in the blank provided if the statement in each item is (semantically and syntactically) valid. Write I, otherwise.

```
char **cptr, *c, x = 'A', y = 'B', z = '2';
int v, w = 7, *p1, *p2, **pptr;
```

- | | |
|-------------------------|-------------------------|
| <u>✓</u> 1. cptr = &c; | <u>I</u> 6. pptr = p2; |
| <u>✓</u> 2. p1 = &v; | <u>I</u> 7. cptr = &p2; |
| <u>✓</u> 3. pptr = &p1; | <u>✓</u> 8. p2 = *pptr; |
| <u>✓</u> 4. c = &y; | <u>✓</u> 9. *p1 = 21; |
| <u>I</u> 5. pptr = &v; | <u>✓</u> 10. *c = z; |

II. (0.5 pts each) Executing all valid statements in Test I, write in the blank the **output** of the following statements or the **value** of the variables.

- | | |
|--|--------------------------------------|
| <u>2</u> 1. y | <u>42</u> 6. (*p2) + (**pptr) |
| <u>21</u> 2. v | <u>22</u> 7. printf("%c %c", *c, z); |
| <u>2</u> 3. *c | <u>28</u> 8. w + w + (*p2 - w) |
| <u>21</u> 4. **pptr | <u>28</u> 9. **pptr + w |
| 002 or address (2y) <u>05</u> 5. *cptr | <u>63</u> 10. *p2 + *p1 + **pptr |

III. (5 pts) Draw on the right column the resulting box-and-arrow diagram of the code snippet from the left. Assume that everything is in the main() function. Draw a diagram for each assignment statement to show how the pointers and values change for each assignment statement.

```
1 int x=2, y=3, z=4, *a;
2 int **p, *c, **d;
3
4 p = &c;
5 c = &x;
6 d = p;
7 a = &y;
8 **p = 7;
9 *p = a;
10 **d = *c + **p;
11 *d = &z;
12 *a = x;
```

Diagrams are drawn in the next few pages.

int x y z

★ a c

★★ p d

Diagram 1: **p = &c;**

int x y z

★ a c

★★ p d

Diagram 2: **c = &x;**

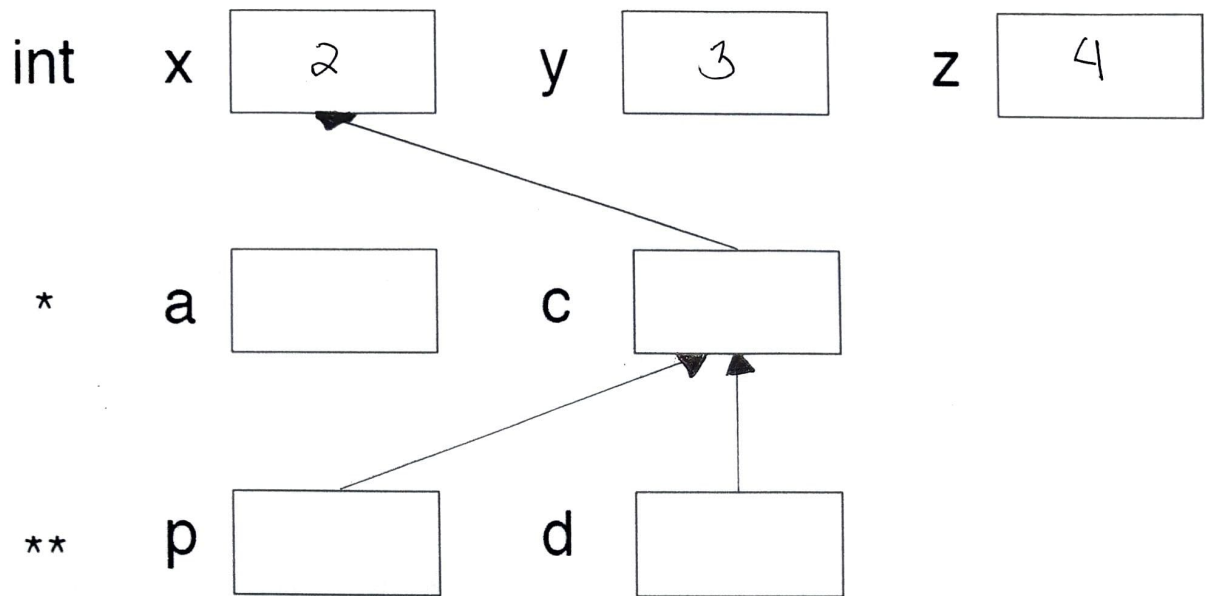


Diagram 3: `d = p;`

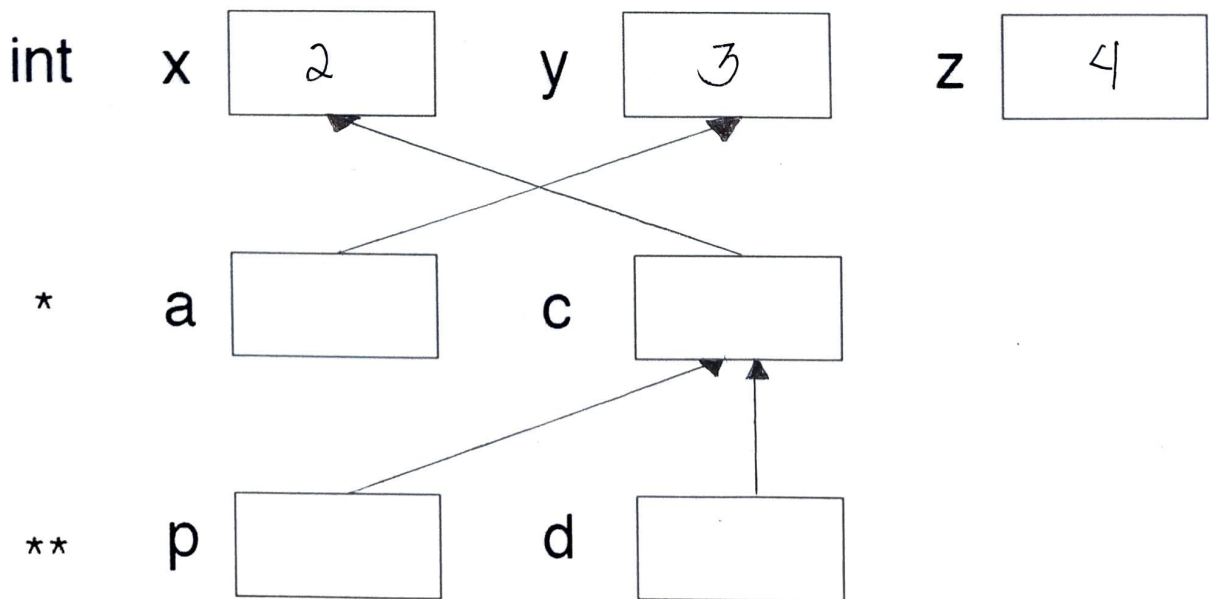


Diagram 4: `a = &y;`

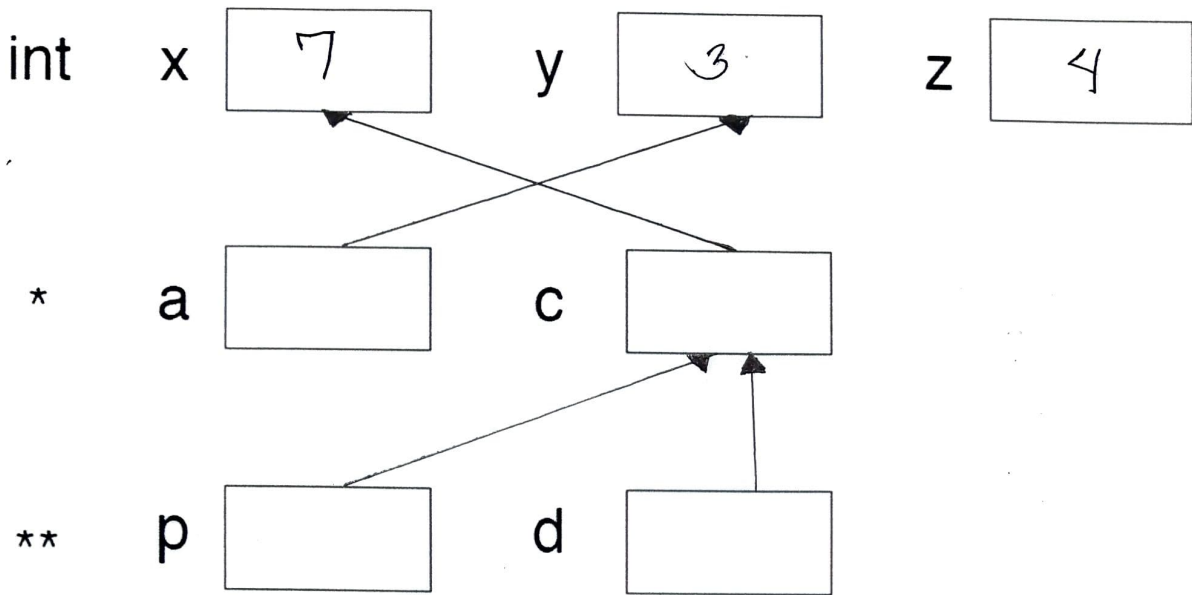


Diagram 5: `**p = 7;`

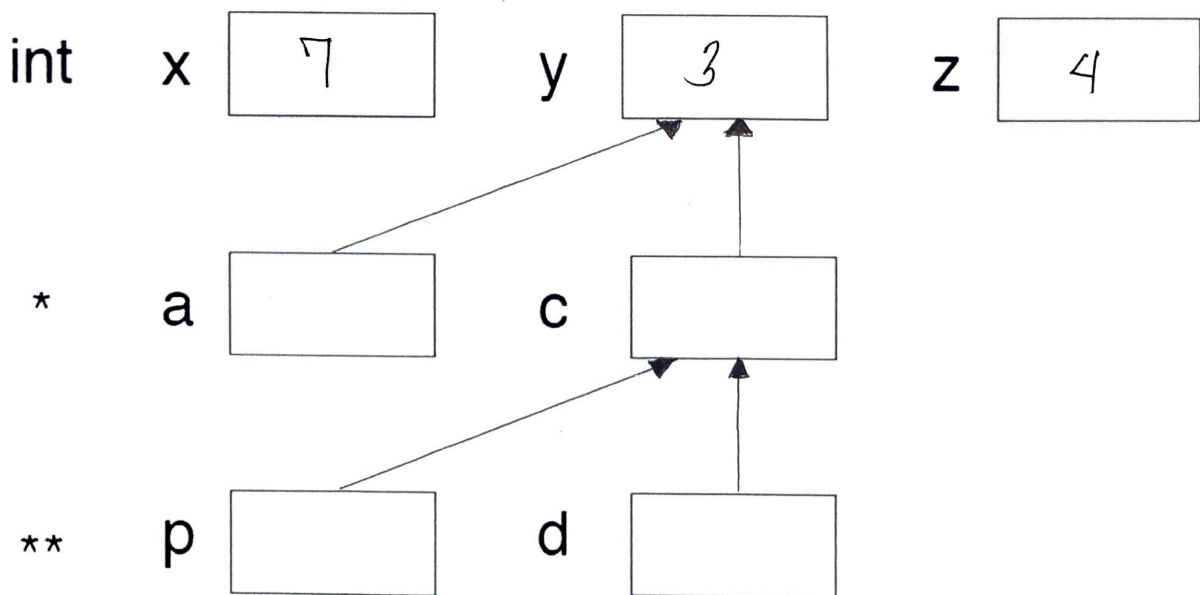


Diagram 6: `*p = a;`

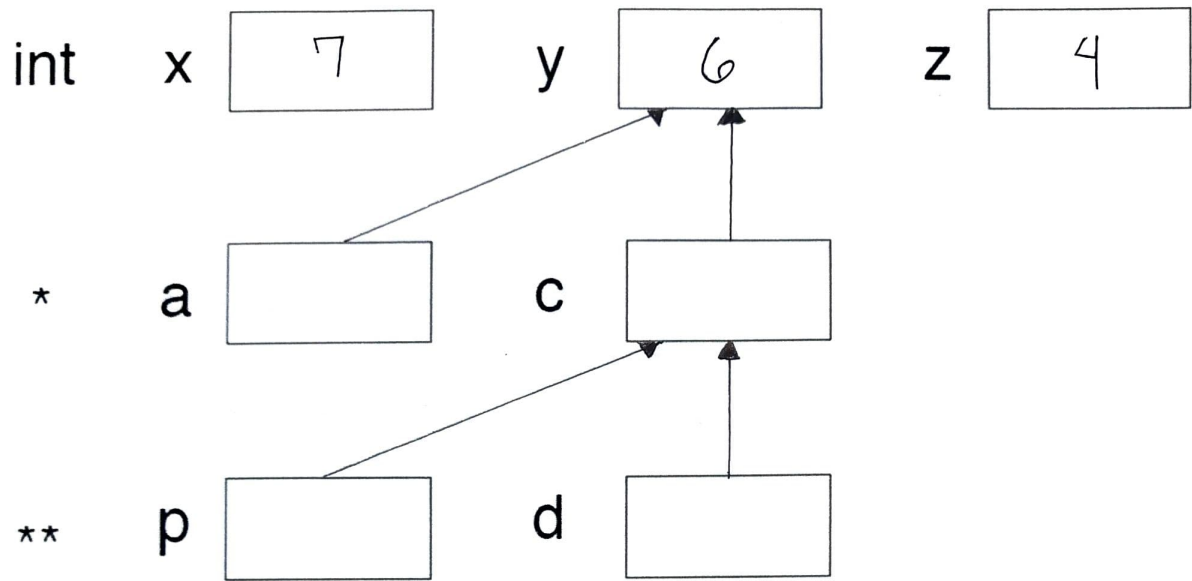


Diagram 7: `**d = *c + **p;`

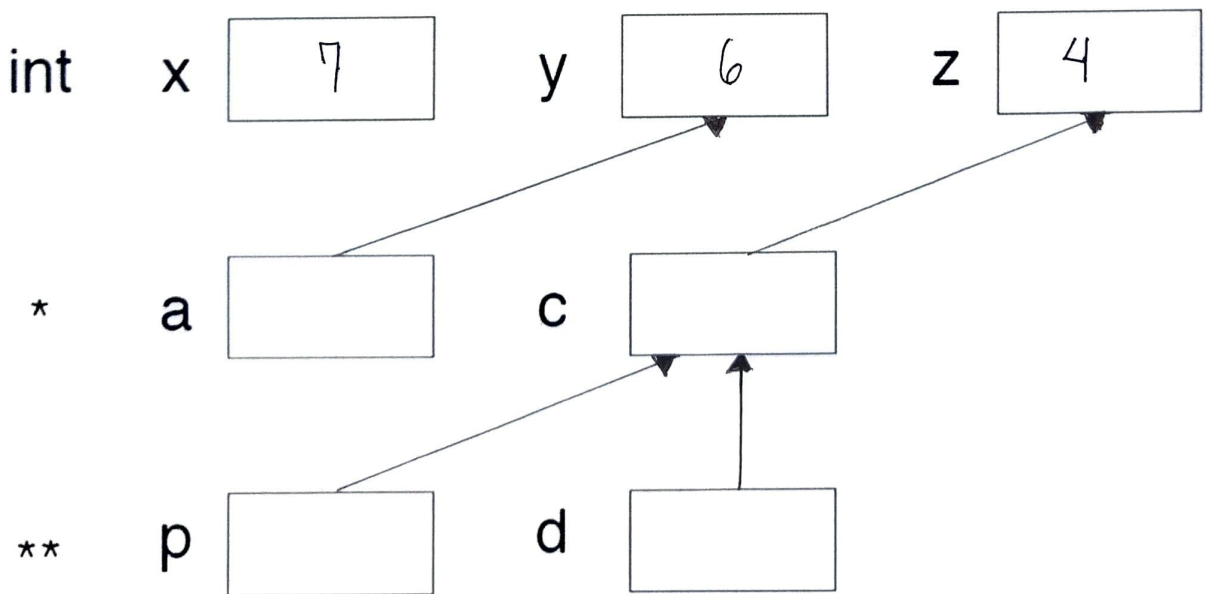


Diagram 8: `*d = &z;`

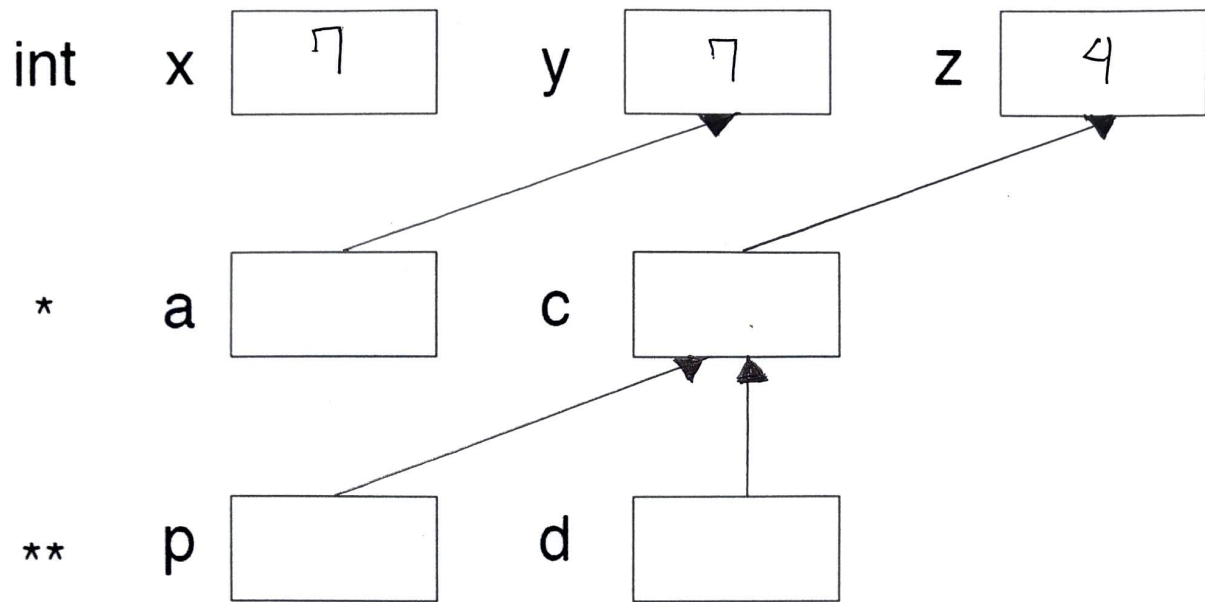


Diagram 9: `*a = x;`

Memory Slots		1	2	3	4	5	6	7	8	9	Final
001 x	2					7					7
002 y	3							6		7	7
003 z	4										4
004 a					002						002
005 c			001				002		003		003
006 d				005							005
007 p		005									005

Table 1: Final Data Values