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Exercise 1

Text answer | Old exam question | Consider the following program fragment:

```
1  int x;
2  int y;
3  int z;
4  int* w;
5  int* q;
6
7  x = 0;
8  y = 1;
9  z = 2;
10 w = &x;
11 q = &y;
12 *w = y;
13 *q = z;
14 *w = x + y + z + *q;
15 *q = x + y + z + *w;
16
17 printf("x=%d, y=%d, z=%d\n", x, y, z);
```

? Question

What does the program print when it is executed?

Line 1-5 declares 5 variables, the first 3, x, y, and z, are integer variables and the fourth, w, and fifth, q, variables are integer pointer variables.

Then from line 7-15 the variables are assigned values. First x is given the value of 0, y is given a value of 1 and z is given a value of 2. Afterward w is pointed to x and q is pointing to y.

At line 12 the value of y is assigned to pointed location of w, which is x, thus the value of x is now 1. The same is happening at line 13 but with the value of z to the pointed memory location of q which means that y is now assigned the value of 2.

Line 14 and 15 are calculations. The variable that is changed is the pointed locations of w and q, respectively x and y.

The calculations result in:

*w = x + y + z + *q ⇒ x = 1 + 2 + 2 + 2 = 7

X is now assigned the value of 7 and therefore *w also equal to 7 since its pointing to the value of x

*q = x + y + z + *w ⇒ y = 7 + 2 + 2 + 7= 18

The last line just prints the current values of x, y and z which should be 7, 18 and 2.

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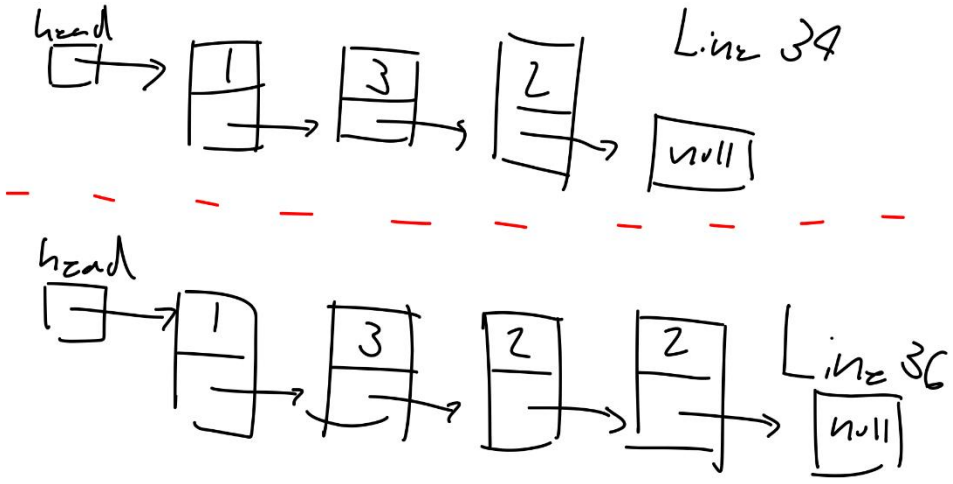
Exercise 3:

(a) Draw **two** diagrams that shows the contents of `list` at the two lines with the comment `// show list here` in `main` (line 34 and 36).



(c) What does the following code do when executed? (i.e. does the code fulfill the post condition? If not, what happens?)

The code does not fufill the post condition, as there's no code to tell the program to move to the next node, and will there fore keep printing out the first list of values.