CS246: Programming Paradigms
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Pointers

These exercises are adapted from King, chapter 11–12.

1. If `i` is a variable and `p` points to `i`, which of the following expressions are aliases for `i`? Circle the ones that are.

   (a) `*p` (c) `*&p` (e) `*i` (g) `*&i`
   (b) `&p` (d) `&*p` (f) `&i` (h) `&*i`

2. If `i` is an `int` variable and `p` and `q` are `int*` pointers, which of the following assignments are legal? Circle the ones that are.

   (a) `p = i;` (d) `p = &q;` (g) `p = *q;`
   (b) `*p = &i;` (e) `p = *&q;` (h) `*p = q;`
   (c) `&p = q;` (f) `p = q;` (i) `*p = *q;`

3. Write a function `void swap(int* p, int* q)` that swaps the contents of two variables. How would you call `swap` on two `int` variables `i` and `j`?

4. Suppose we have the following:

```
int a[] = {5, 15, 34, 54, 14, 2, 52, 72};
int* p = &a[1];
int* q = &a[5];
```

   What do each of the following evaluate to?

   (a) `*(p + 3)` (c) `q - p` (e) `*p < *q` (g) `*(a + 2)`
   (b) `*(q - 3)` (d) `p < q` (f) `p - a` (h) `*p + 3`