**Assignment 3 – Run-Time Analysis**

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Question 1:

* Cost Function:
* Barometer Operations: Checking the inner while loop condition (j < n), incrementing j (j++), the use of the << operator within the while loop twice. In total, 4 operations.
* O-Notation: this runs in O(n2)

Question 2:

* Cost Function:
* Barometer Operations: Checking both inner while loop conditions (j <= i), incrementing j (j++), and use of the << operator within the loop. 3 operations per while loop, 6 total operations.
* O-Notation: this runs in O(n2)

Question 3:

* Cost Function:
* Barometer Operations: Checking the inner most while loop condition (iNext < rows), incrementing iNext (iNext++), and operating on next with the two calls to *rcIndex()* (which has a cost of 1). In total, 5 operations.
* O-Notation: this runs in O(n3)

Question 4:

* Cost Function:
  + When n is even:
  + When n is odd:
* Barometer Operations: Checking the inner while loop condition (next < n), incrementing next (next++), checking the if statement condition (arr[next] < arr[smallest]).
* O-Notation: this runs in O(n2)

Question 5:

* Cost Function:
* Barometer Operations: Checking the inner while loop condition (ast < n), incrementing ast (ast++), and the use of the << operator within the loop.
* O-Notation: this runs in O()

Question 6:

* Cost Function:
* Barometer Operations: First if statement condition (len == 0) and the second if statement condition (arr[0] == target) since they will run each time a recursive call is made.
* O-Notation: this runs in O(2n)

Question 7:

* Cost Function:
* Barometer Operations: Checking the while loop condition (exp > 0), checking the if statement condition (exp & 1), use of the >>= operator ( exp >>= 1), and re-assignment of base (base = base\*base).
* O-Notation: this runs in O()