Question 3: Array / ArrayList — 9 points

Canonical solution

(a) — **4 points**

```
public void cleanData(double lower, double upper)
{
   for (int i = temperatures.size() - 1; i >= 0; i--)
   {
      double temp = temperatures.get(i);
      if (temp < lower || temp > upper)
      {
         temperatures.remove(i);
      }
   }
}
```

(b) — **5 points**

```
public int longestHeatWave(double threshold)
{
   int waveLength = 0;
   int maxWaveLength = 0;

   for (double temp : temperatures)
   {
      if (temp > threshold)
      {
         waveLength++;
         if (waveLength > maxWaveLength)
         {
            maxWaveLength = waveLength;
         }
      }
      else
      {
         waveLength = 0;
      }
   }
   return maxWaveLength;
}
```

(a) `cleanData`

	Scoring Criteria	Decision Rules	
1	Traverses `temperatures` (*no bounds errors*)	Responses **can** still earn the point even if they • do a forward traversal of the list • skip a value because removal from the list is handled incorrectly • use an enhanced `for` loop, as long as the list element is used in the body of the loop Responses **will not** earn the point if they • fail to ever access an element of `temperatures` in the loop • access the elements of `temperatures` incorrectly	**1 point**
2	Determines whether an element of temperature list should be removed, using `lower` and `upper`	Responses **can** still earn the point even if they • access elements of temperature list incorrectly Responses **will not** earn the point if they • apply incorrect comparison (`<` vs `<=`) or logic (`||` vs `&&`) to identify elements of list for removal	**1 point**
3	Calls `remove` (or equivalent) on temperature list with an appropriate parameter	Responses **can** still earn the point even if they • add the element to a new `ArrayList` that is not declared, is declared incorrectly, or is not assigned to the instance variable, as long as the order of elements is maintained Responses **will not** earn the point if they • call `remove` or `add` incorrectly	**1 point**
4	Removes all and only identified elements of temperature list (*algorithm*)	Responses **can** still earn the point even if they • call `remove` incorrectly • access the elements of temperature list incorrectly Responses **will not** earn the point if they • add elements to a new `ArrayList` that is not declared, is declared incorrectly, or is not assigned to the instance variable • skip a temperature list element in the traversal because removal is not handled correctly	**1 point**
		Total for part (a)	**4 points**

(b) `longestHeatWave`

	Scoring Criteria	Decision Rules	
5	Traverses `temperatures` (*no bounds errors*)	Responses **will not** earn the point if they • fail to access an element of `temperatures` in the loop • access the elements of `temperatures` incorrectly	**1 point**
6	Compares an element of temperature list to `threshold` (*in the context of a loop*)	Responses **can** still earn the point even if they • always compare `threshold` to the same list element Responses **will not** earn the point if they • apply incorrect comparison (`>` vs `>=`) to identify heat wave days	**1 point**
7	Initializes and increments the length of a heat wave (*in the context of a loop or condition*)	Responses **can** still earn the point even if they • fail to reset the length of the current heat wave when the heat wave ends	**1 point**
8	Determines the length of at least one heat wave (*algorithm*)	Responses **will not** earn the point if they • fail to reset the length of the current heat wave when the heat wave ends	**1 point**
9	Identifies the longest heat wave and returns its length (*algorithm*)		**1 point**
		Total for part (b)	**5 points**
	Question-specific penalties		
	None		
		Total for question 3	**9 points**