

⑪ Check if there are pairs that add up to 0.

```

set<Integer> s = new HashSet<>();
for(int i=0; i<a.length; i++) {
    if(s.contains(-1*a[i])) return true;
    s.add(a[i]);
}
return false;

```

⑫ Get median from running stream of numbers.

- Create min and max heap.
- ~~Add numbers~~ Rebalance them
- Get median.
- Repeat for each element.

```

double[] runningMedians(int[] a) {
    Priority Queue<Integer> lowers = new Priority Queue<Integer>(
        (Integer a, Integer b) => { return b-a; });
    Priority Queue<Integer> higher = new Priority Queue<Integer>();
    double[] medians = new double[a.length];
    for(int i=0; i<a.length; i++) {
        if(lowers.size() == 0 || a[i] < lowers.peek())
            lowers.add(a[i]);
        else higher.add(a[i]);
        rebalance(lowers, higher);
        medians[i] = median(lowers, higher);
    }
    return medians;
}

```

```

void rebalance(Priority Queue<Integer> q1, Priority Queue<Integer> q2) {
    if(q1.size() > q2.size() || (q1.size() - q2.size()) > 1) {
        q2.offer(q1.poll());
    } else if(q2.size() > q1.size() || (q2.size() - q1.size()) > 1) {
        q1.offer(q2.poll());
    }
}

double getMedian(Priority Queue<Integer> q1, Priority Queue<Integer> q2) {
    if(q1.size() == q2.size())
        return (double)(q1.peek() + q2.peek())/2;
    return q2.size() > q1.size() ? q2.peek() : q1.peek();
}

```

⑬ Product Exclusion: For a given array return array where $a[i] = \text{prod of all other elements except } a[i]$.

- Get product of all elements. for each element in result divide product by $a[i]$:

```

int[] prodExclusion(int[] a) {
    int product = 1;
    for(int i=0; i<a.length; i++)
        product *= a[i];
    int[] result = new int[a.length];
    for(int i=0; i<a.length; i++)
        result[i] = product / a[i];
    return result;
}

```