```
inversionCountBruteForce(A)
    //A[0..n-1] array of distinct numbers of size n
    //inversion means, A[i] > A[j] for i < j
    count ← 0
    for each i ← 0 to n-2 do
        for each j ← i+1 to n-1 do
            if A[i] > A[j]
                count ← count + 1
    return count
```

Analysis

Basic Operation: Comparison

$$T(n) = \sum_{i=0}^{n-2} \sum_{j=i+1}^{n-1} 1$$

$$= \sum_{i=0}^{n-2} (n-1-i-\cancel{1}+\cancel{1})$$

$$= \sum_{i=0}^{n-2}(n-1) - \sum_{i=0}^{n-2} i$$

$$= (n-1)(n-2-0+1) - \frac{(n-2)(n-2+1)}{2}$$

$$= (n-1)(n-1) - \frac{(n-2)(n-1)}{2}$$

$$= (n-1)\frac{(2n-\cancel{2}-n+\cancel{2})}{2}$$

$$= \frac{(n-1)n}{2} \in \Theta(n^2)$$

```
convexHullBruteForce(A)
  // A[0..n-1] array of points of size n
  hull ← {}, collinear_points = {}
  swap the first point with leftmost extreme point
  for each i ← 0 to n-2 do
     for each j ← i+1 to n-1 do
        previousSign ← 0,        farthest_point A[j], rem_points = A - {A[i], A[j]
        a = A[j]_y - A[i]_y , b = A[i]_x - A[j]_x , c = A[i]_x A[j]_y - A[i]_y A[j]_x
        for each k ← 0 to n-2 do
          cursign = a * rem_points[k]_x + b * rem_points[k]_y - c
          if cur_sign = 0 do  //select farthest collinear point
             if distance of A[i] to rem_points[k] > distance of A[i] to farthest_pt
                  collinear_points ∪ {farthest_point}
                  farthest_point = rem_points[k]
                  continue

          if prev_sign is 0 do:
                  prev_sign = cur_sign
                  continue

          if prev_sign ≠ cur_sign
                break

        if k = n-2: hull ← hull ∪ ({A[i], farthest_point}
                                  ∩ collinear_points)

  return hull
```

Analysis

Basic operation. Sign detection which has 2 multiply and 3 add/sub. So, multiply most expensive operation happening every iteration

$$M(n) = \sum_{i=0}^{n-2} \sum_{j=i+1}^{n-1} \sum_{k=0}^{n-2} 1 = \sum_{i=0}^{n-2} \sum_{j=i+1}^{n-1} (n-2+1)$$

$$= \sum_{i=0}^{n-2} \sum_{j=i+1}^{n-1} (n-1) = \sum_{i=0}^{n-2} (n-1)(n-1-i-\cancel{1}+\cancel{1})$$

$$= (n-1)\sum_{i=0}^{n-2}(n-1-i) = (n-1)^2 \sum_{i=0}^{n-2} 1 - \sum_{i=0}^{n-2} i$$

$$= (n-1)^2(n-2+1) - \frac{(n-2)(n-2+1)}{2}$$

$$= (n-1)^3 - \frac{(n-1)^3}{2} \in \Theta(n^3)$$