**Benjamin Bowser – CSE274 UA HW2 #3, 4, 5**

**3.**

|  |  |  |
| --- | --- | --- |
| n Value | O(n) Loop | O(n^2) Loop |
| 1 | 0 | 0 |
| 100 | 3 | 0 |
| 500 | 4 | 1 |
| 1000 | 4 | 1 |
| 1500 | 6 | 2 |
| 2000 | 7 | 3 |
| 2500 | 10 | 3 |
| 3000 | 11 | 5 |
| 4000 | 14 | 7 |
| 5000 | 18 | 9 |
| 10000 | 33 | 30 |
| 20000 | 62 | 114 |
| 30000 | 89 | 253 |
| 40000 | 124 | 463 |
| 50000 | 153 | 712 |
| 100000 | 301 | 2802 |

1. **(4 pts)** Determine the best case and worst case Big O for the following piece of code that processes a NxN 2D array.  
     
   1. for (int r=0; r<N; r++)  
       for (int c=r; c<N; c++)  
       if (ary[r][c] == key)  
       return true;  
      return false;

**Worst: O(N^2) Best: O(1)**

1. A. **O(N^2)**

B. **O(N)**

C. **O(N)**

D. **O(N)**

E. **O(N^2)**

F. **O(N^4)**