CSC 130 Midterm 2

1. What is the worst case tight bound runtime of the following code? 20 pt

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Description automatically generated

for (i = n; i > 0; i -= 2) {

if (i % 2 == 0) {

q = i

while (q != 0) {

q -= 2

}

}

}

1. What is the worst case tight bound runtime of the following code? 20pt

sum = 0

for (i = 0; i < n; i++) {

for (j = 0; j < i\*i; j++) {

if (j > 2) {

break

}

sum++

}

}

1. We begin by considering a 3-heap (a heap where each node has at most 3 children) stored as an array. What are the indices of the parent and *n*​th child of index *k*​? That is, fill in the following mathematical functions. 20 pt

\*Assuming the first element starts at index 0 in the heap (array)

parent(*k*​) = (k-1)/3

child-0(*k*​) = 3k+1

child-1(*k*​) = 3k+2

child-2(*k*​) = 3k+3

1. Update the implementation for a minHeap deleteMin given a 3-heap, include your Java code. 20 pts
2. Update the implementation for a minheap insert given a 3-heap, include your Java code. 20 pts