PS3Q2

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1 Question Two

1.1 Part a

- The sequence with the largest possible total cost is $n-1$ insert statements followed by a single cut statement. This will cause the worst possible cost to be $2(n-1)$ or $2n-2$.
- This means the upper bound of the cost will be:

$= \frac{2n-2}{n}$
$= 2 - \frac{2}{n}$

1.2 Part b

- Each inserted element should be charged \$2.75 This will leave enough money for an insert to occur at \$0 and collect enough money to allow for a cut operation. When an element is inserted, it has a carry over of \$1.75. If n elements are inserted, there is a carry over of \$n·1.75. This added cost allows for n elements to be inserted, and cut can be called until k is equal to 0 without running out of money. When calling cut untill k = 0, there will either be a remainder of $0 \leq X \leq 1.75$