operation	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
cost	1	2	1	4	1	1	1	8	1	1	1	1	1	1	1	16
running total	1	3	4	8	9	10	11	19	20	21	22	23	24	25	26	42

operation	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
cost	1	2	1	4	1	1	1	8	1	1	1	1	1	1	1	16
running total	1	3	4	8	9	10	11	19	20	21	22	23	24	25	26	42

The total is

$$
\begin{aligned}
n + \sum_{j=1}^{\lfloor \lg n \rfloor} 2^j - \lfloor \lg n \rfloor &= n + \frac{2^{\lfloor \lg n \rfloor + 1} - 2}{2 - 1} - \lfloor \lg n \rfloor \\
&= n + 2 \cdot 2^{\lfloor \lg n \rfloor} - 2 - \lfloor \lg n \rfloor \\
&\leq n + 2 \cdot 2^{\lg n} \\
&= n + 2n = 3n
\end{aligned}
$$