Quantum Subtractor:

$$\sum_{j=0}^{1_n-1} \sqrt{p_j}\,|N-j-1_n\rangle\,|0\rangle\,[\cos(\frac{\pi}{4})\,|0\rangle+\sin(\frac{\pi}{4})\,|1\rangle]$$

$$+\sum_{j=1_n}^{N-1} \sqrt{p_j}\,|j-1_n\rangle\,|1\rangle\,[\cos(\frac{\pi}{4})\,|0\rangle+\sin(\frac{\pi}{4})\,|1\rangle]$$

Apply CCRY gates:

$$\sum_{x=0}^{1_n-1} \sqrt{p_x}\,|N-x-1_n\rangle\,|0\rangle\,(\cos\frac{\pi}{4}\,|0\rangle+\sin\frac{\pi}{4}\,|1\rangle)$$

$$+\sum_{x=1_n}^{N-1} \sqrt{p_x}\,|x-1_n\rangle\,|1\rangle\otimes(\cos\theta\,|0\rangle+\sin\theta\,|1\rangle)$$

Where $\theta=\frac{\pi}{4}+0.4c(x-1_n)$ and $c$ is a small number.