11.3-4.

Consider a hash table of size $m = 1000$ and a corresponding hash function $h(k) = \lfloor m(k\ A \bmod 1) \rfloor$ for $A = \left(\sqrt{5} - 1\right)/2$. Compute the locations to which the keys 61, 62, 63, 64 and 65 are mapped.

Answer.

$$\begin{aligned} h(61) &= \left\lfloor 1000 \left(61 \cdot \frac{\sqrt{5}-1}{2} \bmod 1 \right) \right\rfloor \\ &= 700 \end{aligned}$$

$$\begin{aligned} h(62) &= \left\lfloor 1000 \left(62 \cdot \frac{\sqrt{5}-1}{2} \bmod 1 \right) \right\rfloor \\ &= 318 \end{aligned}$$

$$\begin{aligned} h(63) &= \left\lfloor 1000 \left(63 \cdot \frac{\sqrt{5}-1}{2} \bmod 1 \right) \right\rfloor \\ &= 936 \end{aligned}$$

$$\begin{aligned} h(64) &= \left\lfloor 1000 \left(64 \cdot \frac{\sqrt{5}-1}{2} \bmod 1 \right) \right\rfloor \\ &= 554 \end{aligned}$$

$$\begin{aligned} h(65) &= \left\lfloor 1000 \left(65 \cdot \frac{\sqrt{5}-1}{2} \bmod 1 \right) \right\rfloor \\ &= 172 \end{aligned}$$

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