Farhan Syed Task 13

Ind 2 2)

Vi kan skriva metoden som funktionen:

$$f(n) = x^{\lfloor \frac{n}{2} \rfloor} \cdot x^{\lfloor \frac{n+1}{2} \rfloor} = x^n \qquad n > 4$$

Bassteg: $n = 5$ ger: $VL = x^{\lfloor \frac{5}{2} \rfloor} \cdot x^{\lfloor \frac{6}{2} \rfloor} = x^2 \cdot x^3 = x^5$

$HL = x^5$

Basfallet gäller!

Induktionsantagandet $n = k$

$$\Rightarrow f(k) = x^{\lfloor \frac{k}{2} \rfloor} \cdot x^{\lfloor \frac{k+1}{2} \rfloor} = x^k \qquad k > 4$$

Induktionssteg Vi vill visa att: $f(k+1) = x^{\lfloor \frac{k+1}{2} \rfloor} \cdot x^{\lfloor \frac{k+2}{2} \rfloor} = x^{k+1}$

Vi har $f(k+1) = x^{\lfloor \frac{k+1}{2} \rfloor} \cdot x^{\lfloor \frac{k+2}{2} \rfloor}$

En omskrivning av $f(k)$ ger $x^{\lfloor \frac{k+1}{2} \rfloor} = \frac{f(k)}{f(\lfloor \frac{k}{2} \rfloor)}$

Enligt Induktionsantagandet:

$$f(k+1) = \frac{f(k)}{f(\lfloor \frac{k}{2} \rfloor)} \cdot x^{\lfloor \frac{k+2}{2} \rfloor}$$

$$= \frac{x^k}{x^{\lfloor \frac{k}{2} \rfloor}} \cdot x^{\lfloor \frac{k+2}{2} \rfloor}$$

$$= x^{k + \lfloor \frac{k+2}{2} \rfloor - \lfloor \frac{k}{2} \rfloor}$$

$$= x^{k+1-0}$$

$$= x^{k+1}$$

V.S.B