$\int_0^1 c(x+a)\, dx = 1$

$c \int_0^1 (x+a)\, dx = c(\int_0^1 x\, dx \ + c \int_0^1 a\, dx)$

$\int x\, dx = \frac{x^2}{2} \quad \int a\, dx = ax$

$c(\frac{x^2}{2} + ax)\Big|_0^1 = c((\frac{1}{2} + a) - (\frac{0}{2} + 0)) = c(\frac{1}{2} + a)$

$c(\frac{1}{2} + a) = 1$

$c = \frac{1}{\frac{1}{2} + a}$

$a = 1.1; c = \frac{1}{\frac{1}{2} + 1.1} = 0.625$

$$f(x) = \begin{cases} 0 & x < 0 \\ 0.625x + 0.6875 & 0 \le x \le 1 \\ 0 & 1 < x \end{cases}$$