Theorem (3.2.21c). *Let f be the function defined by $f(n) = n^{2^n} + n^{n^2}$. $f(n)$ is $\mathcal{O}(n^{2^n})$.*

Proof. From the definition for logarithmic functions it follows that $\log_n(n^{2^n}) + \log_n(n^{n^2}) = 2^n + n^2$. 2^n and n^2 are in the set of reference functions. Also, $n^2 \leq 2^n$, for all $n > 5$. So, $\max(n^{2^n}, n^{n^2}) = n^{2^n}$. Since the bounding function for a sum of functions is the maximum bounding function in the addends of that sum, and because f is the sum of functions $n^{2^n} + n^{n^2}$, $\max(n^{2^n}, n^{n^2}) = n^{2^n}$ is the bounding function for f. Hence, $f(n)$ is $\mathcal{O}(n^{2^n})$. ∎