Lecture 6 Special class for exercises in Chapter 3

Example 1.1 Suppose $f(x)$ is defined in (a,b) and for any $x \in (a,b)$, there is some neighborhood O_x of x in which $f(x)$ is bounded. Is $f(x)$ bounded in (a,b)?

If we replace (a,b) with $[a,b]$ in the above statement, is $f(x)$ bounded?

Solution Let $f(x)=\frac{1}{x}$ in $(0,1)$. This example shows that the answer to the first question is negative.

By Finite covering theorem, we see that $f(x)$ is bounded in $[a,b]$.