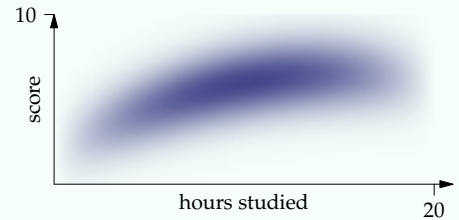


DATA 1010
IN-CLASS EXERCISES
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Problem 1

Describe the qualitative effect on the heatmap shown of the $x(20 - x)$ factor in the density

$$f(x, y) = \frac{3}{4000(3/2)\sqrt{2\pi}} x(20 - x) e^{-\frac{1}{2(3/2)^2} \left(y - 2 - \frac{1}{50}x(30 - x)\right)^2}.$$



Problem 2

Suppose that $D_\lambda : \mathbb{R} \rightarrow \mathbb{R}$ is a function whose support is equal to $[-\lambda, \lambda]$. What is the support of $K_\lambda(x, y) = D_\lambda(x)D_\lambda(y)$?

(Note: the support of a function is the set of all points where the function is nonzero, together with the boundary of that set.)