pGrid, pMesh and pSurf

$b := 50\ \text{cm}$ $n_x := 10$

$T_4 := 150\ °\text{C}$ $T_3 := 200\ °\text{C}$

$$\frac{d}{dx}(T(x, y)) + \frac{d}{dy}(T(x, y)) = 0$$

$a := 25\ \text{cm}$

$n_y := 5$

$T_1 := 100\ °\text{C}$ $T_2 := 50\ °\text{C}$

$$T := \left| \begin{array}{l} Temp(t_0, t_1, x) := t_0 + (t_1 - t_0) \cdot x \\ \text{for } i \in [1..(n_x + 1)] \\ \quad \left| \begin{array}{l} T_{i\,1} := Temp\left(T_1, T_2, \frac{i-1}{n_x}\right) \\ T_{i\,n_y+1} := Temp\left(T_4, T_3, \frac{i-1}{n_x}\right) \end{array} \right. \\ \text{for } j \in [1..(n_y + 1)] \\ \quad \left| \begin{array}{l} T_{1\,j} := Temp\left(T_1, T_4, \frac{j-1}{n_y}\right) \\ T_{n_x+1\,j} := Temp\left(T_2, T_3, \frac{j-1}{n_y}\right) \end{array} \right. \\ \left[h_x := \frac{a}{n_x} \quad h_y := \frac{b}{n_y} \quad R := \left(\frac{h_x}{h_y}\right)^2 \right] \\ \text{for } N \in [1..50] \\ \quad \text{for } i \in [2..n_x] \\ \quad\quad \text{for } j \in [2..n_y] \\ \quad\quad\quad T_{i\,j} := \frac{(T_{i-1\,j} + T_{i+1\,j}) + R \cdot (T_{i\,j-1} + T_{i\,j+1})}{2 \cdot (1 + R)} \\ T \end{array} \right.$$

$$X := \left[0, \frac{a}{n_x} .. a\right] \qquad aT := \text{augment}(X, T) \qquad Y := \left[0, \frac{b}{n_y} .. b\right]$$

$$abT := \text{stack}\left(\text{augment}\left("a\backslash b", Y^{T}\right), aT\right)$$

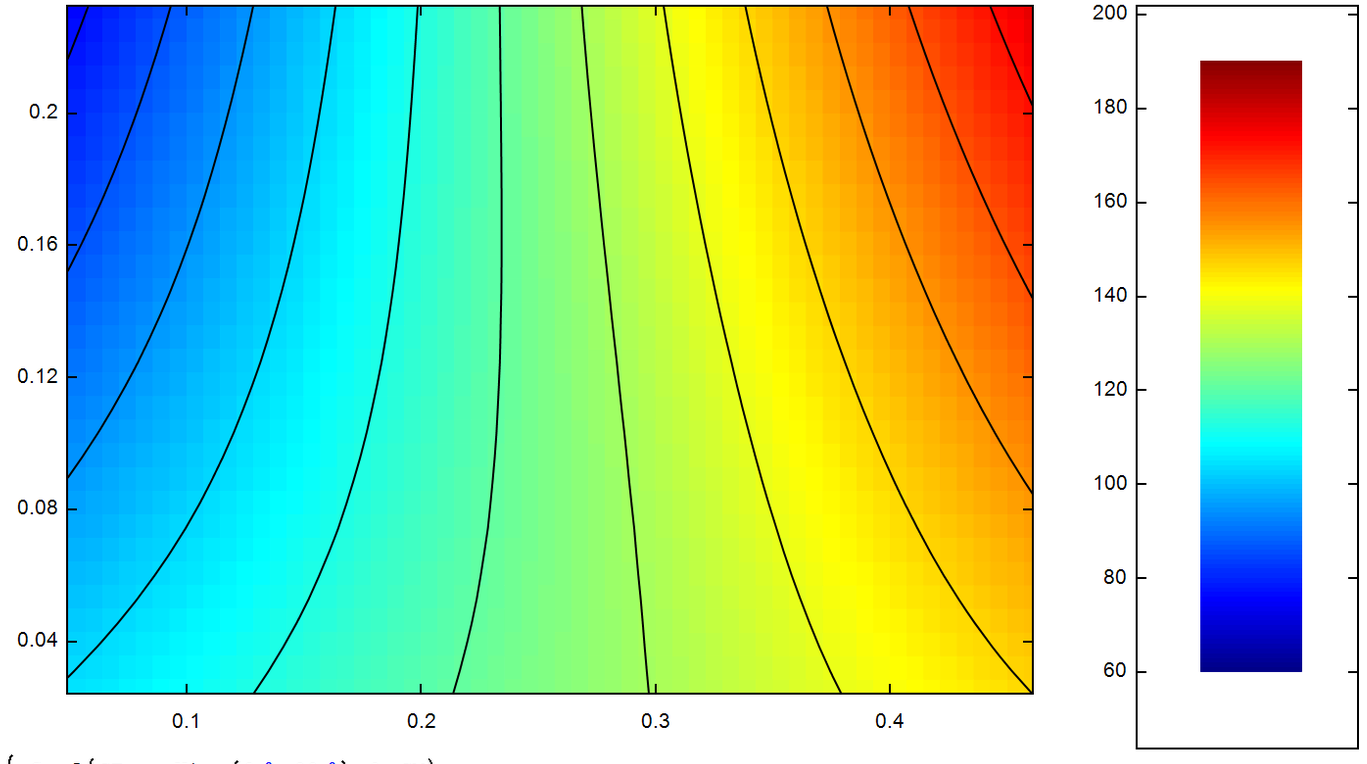
$$T(x, y) := \left| \begin{array}{l} X := \text{submatrix}(abT, 1, 1, 2, \text{cols}(abT)) \\ Y := \text{submatrix}(abT, 2, \text{rows}(abT), 1, 1) \\ Z := \text{submatrix}(abT, 2, \text{rows}(abT), 2, \text{cols}(abT)) \\ \text{InterpBilinear}(X, Y, Z, x, y) \end{array} \right.$$

$T(0\ \text{cm}, 20\ \text{cm}) = 60\ °\text{C}$ $T(0\ \text{cm}, 10\ \text{cm}) = 80\ °\text{C}$

$pShowAxis := 0$ $CM := pCMap("Jet", 256, 1)$ $cmxy(x, y) := \text{stack}(x, y, y)$

$$T_{xy}(x, y) := \frac{T(x\ \mathrm{m}, y\ \mathrm{m})}{\mathrm{K}} \qquad GT_{xy} := pGrid\left(T_{xy}, \begin{bmatrix} 0 & 0.5 \\ 0 & 0.25 \end{bmatrix}, \begin{bmatrix} 70 \\ 35 \end{bmatrix}\right)$$

$$Tk := [60, 70..190]\ ^\circ\mathrm{C} \qquad Plot := \{1 \quad \text{for } k \in [1..\mathrm{length}(Tk)]$$
$$Plot_k := T(x\ \mathrm{m}, y\ \mathrm{m}) - Tk_k$$



$$\{pSurf(GT_{xy}, pView(0^\circ, 90^\circ), 0, \mathrm{CM})\ Plot$$

Alvaro

$$\mathrm{appVersion}(4) = "1.0.8348.30405"$$