

# Heat Diffusion Sandbox

**Goal:** Build an interactive program which simulates 2D heat diffusion on a rectangular plane and can visualize the temperature field over time. The user can choose a plate size, grid resolution, set thermal diffusivity, set initial conditions, and show the animation of the heat map to the user

## Testable Functional Requirements

- Specify grid resolution and physical size
- Specify thermal diffusivity and time step
- Support initial conditions such as temperature, location of hot-spot(s) and their radius'
- Implement the finite-difference method for the 2D heat equation
- Support boundary conditions such as Dirichlet and Neumann
- Should display a live heatmap of the temperature field (and color bar)
- Should save final heatmap data to a CSV/etc. file
- Should save at least one plot of the final heatmap as an image
- Should include some demo scenario presets for the user
- Should show runtime stats