Maple Flow™

A Calculation Tool for Scientists and Engineers

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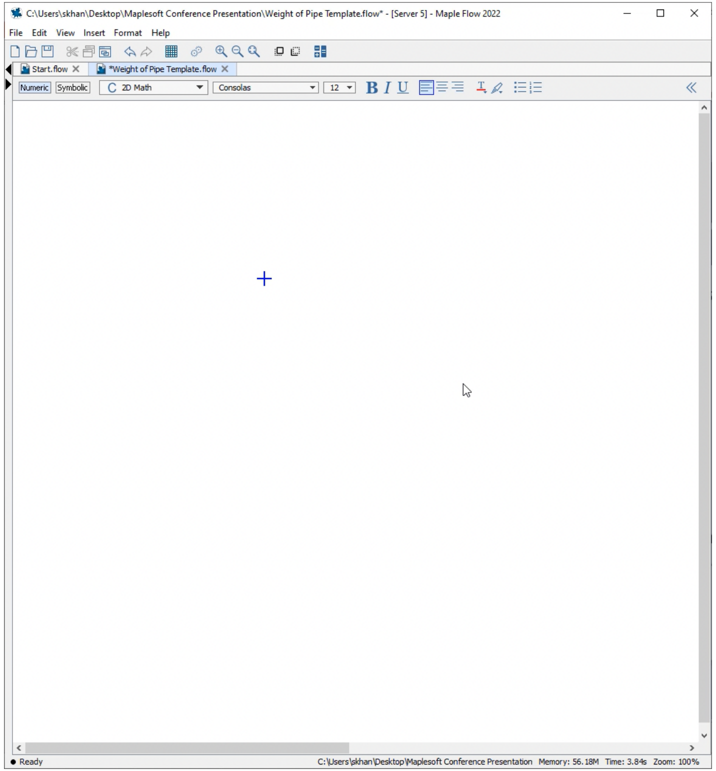
Maple Flow

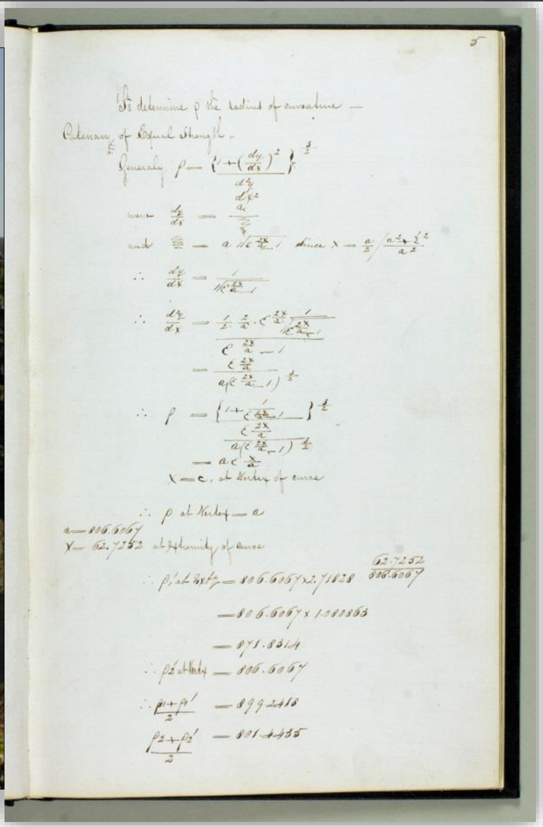
Simple, freeform tool for calculations and documentation

For design engineers and scientists



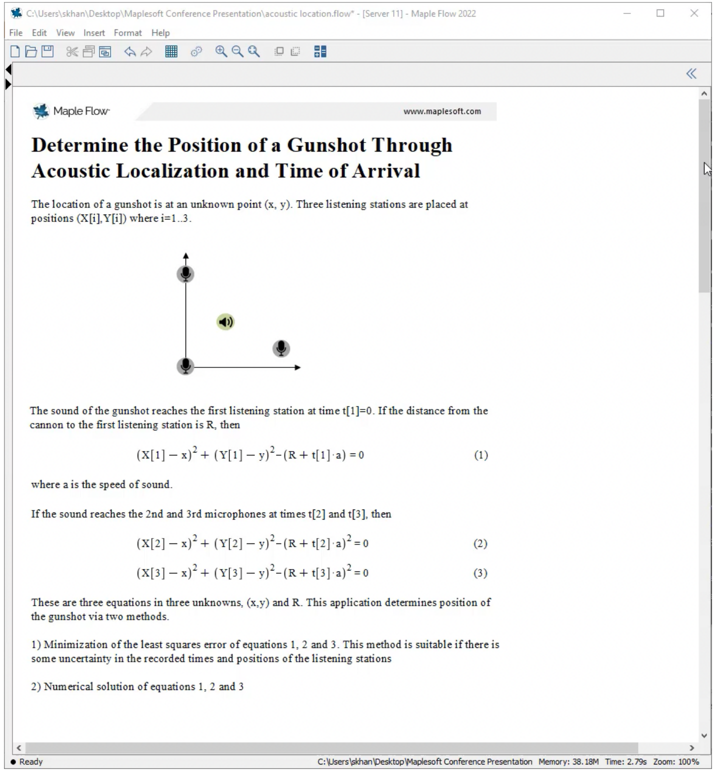
Engineering Calculations in the 1800s

Clifton Suspension Bridge
Designed by Isambard Kingdom Brunel
Opened in 1864



Features

- Place math, text, images and plots anywhere and move into position
- Left-to-right, top-to-bottom evaluation
- Automatic calculation updates
- Natural math notation and units
- Access to nearly all of Maple's math functionality

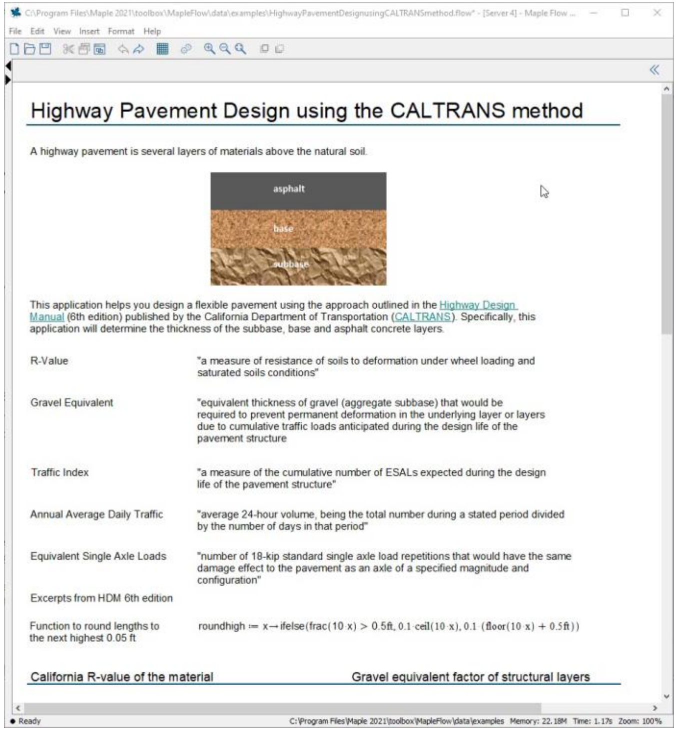


What this means for you

You don’t have to start with a grand plan

Progressive refinement is rewarded

Smooth flow from initial calculation concept to final technical report



Demo

Untitled (32)* - [Server 14] - Maple Flow 2022

$gas := \text{"N2"}$

State 1

Pressure	$P_1 := 2 \times 10^6\ \mathrm{Pa}$
Temperature	$T_1 := 900\ \mathrm{K}$
Internal energy	$u_1 = 6.921 \times 10^5\ \frac{\mathrm{J}}{\mathrm{kg}}$
Specific volume	$v_1 = 0.135\ \frac{\mathrm{m}^3}{\mathrm{kg}}$

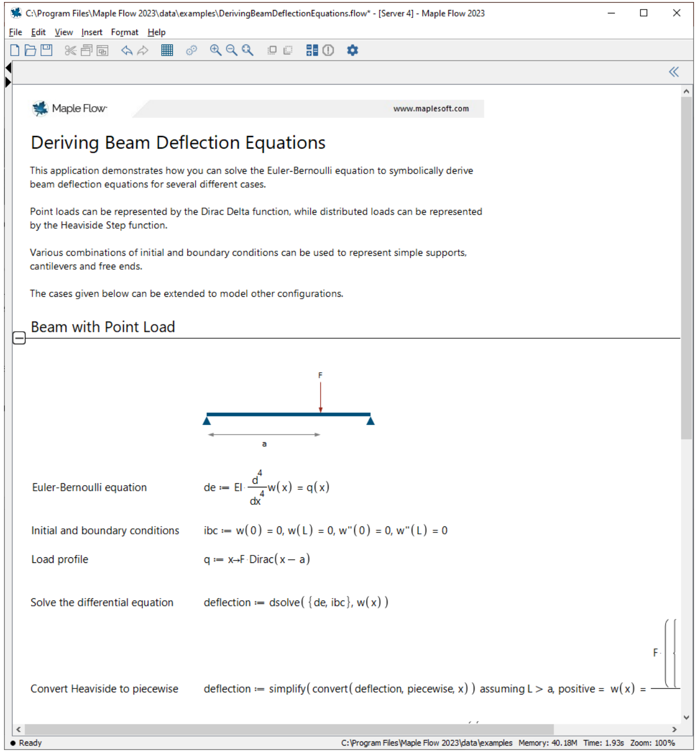
State 2

Pressure	$P_2 := 7 \times 10^6\ \mathrm{Pa}$
Temperature	$T_2 := T_1 = 900\ \mathrm{K}$
Internal energy	$u_2 = 6.901 \times 10^5\ \frac{\mathrm{J}}{\mathrm{kg}}$
Specific volume	$v_2 := 1/\text{ThermophysicalData:-Property}(\text{density, gas, } T = T_2, P = P_2) = 0.039\ \frac{\mathrm{m}^3}{\mathrm{kg}}$
Pressure at any specific volume	$P := \text{ThermophysicalData:-Property}(\text{"pressure", gas, "temperature"} = T_1, \text{"D"} = 1/V)$
Work done in isothermal compression	$w := \int_{v_1}^{v_2} P\, dV = -3.35 \times 10^2\ \frac{\mathrm{kJ}}{\mathrm{kg}}$
Heat transferred per unit mass	$q := u_2 - u_1 + w = -3.37 \times 10^2\ \frac{\mathrm{kJ}}{\mathrm{kg}}$

Ready — C:\Program Files\Maple 2022\toolbox\MapleFlow Memory: 56.18M Time: 5.21s Zoom: 100%

What This Means In The Classroom

- In the classroom
  - Develop mathematically live class notes and electronic hand-outs
  - Give students a clear understanding of the physics by exposing the equations in a readable format
  - Emphasize the importance of units
- Homework & Assignments
  - Give students a simple, freeform scratchpad for doing fully documented calculations
  - Help students spot and correct errors
  - Make calculations fun!



Questions

Power Supply
OUT
FB
Compressor
(adiabatic)
P2 = 1000 kPa
T2 = 343 K
T1 = 253 K