Day-11

→ $\Delta h = f(D, \gamma, \sigma)$

	Δh	D	γ	σ
M	0	0	1	1
L	1	1	−2	0
T	0	0	−2	−2

Rank = 2, Nullity = 2

Choose σ, γ as base units.

→ $\Delta P = f_{\Delta P}(D, L, V, \mu, \rho_f, \varepsilon)$

ε ↓ Roughness ($\varepsilon = [L]$)

	D	L	ε	V	μ	ρ	ΔP
M	0	0	0	0	1	1	1
L	1	1	1	1	−1	−3	−1
T	0	0	0	−1	−1	0	−2

↓ $R_1 \leftrightarrow R_2$

1	1	1	1	−1	−3	−1
0	0	0	0	1	1	1
0	0	0	−1	−1	0	−2

↓ $R_3 \rightarrow R_3 + R_1$

1	1	1	1	−1	−3	−1
0	0	0	0	1	1	1
0	0	0	0	−2	−3	−3

$\downarrow R_3 \to R_3 + 2R_2$

$$\begin{matrix} 1 & 1 & 1 & 1 & -1 & -3 & -1 \\ 0 & 0 & 0 & 0 & 1 & 1 & 1 \\ 0 & 0 & 0 & 0 & 0 & -1 & -1 \end{matrix}$$

Rank = 3, Nullity = 4

Choose ρ, v, D

$$\pi_1 = \frac{\mu}{\rho v D}$$

$$\pi_2 = \varepsilon / D$$

$$\pi_3 = L / D$$

$$\pi_4 = \varepsilon / D$$