

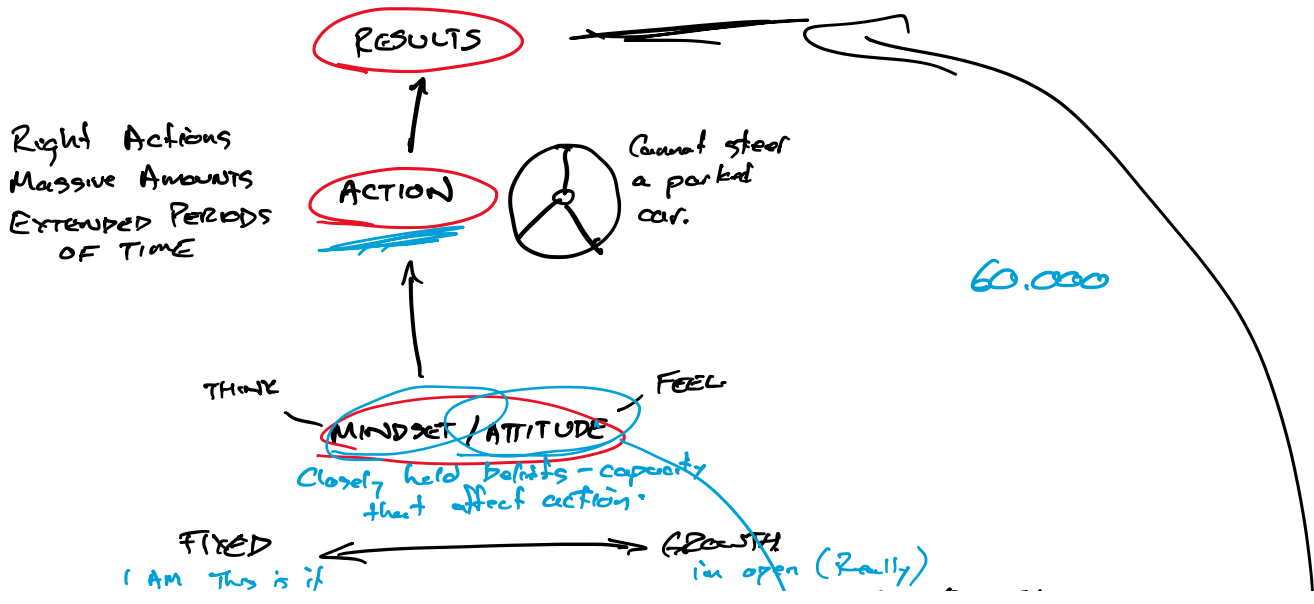
# Results

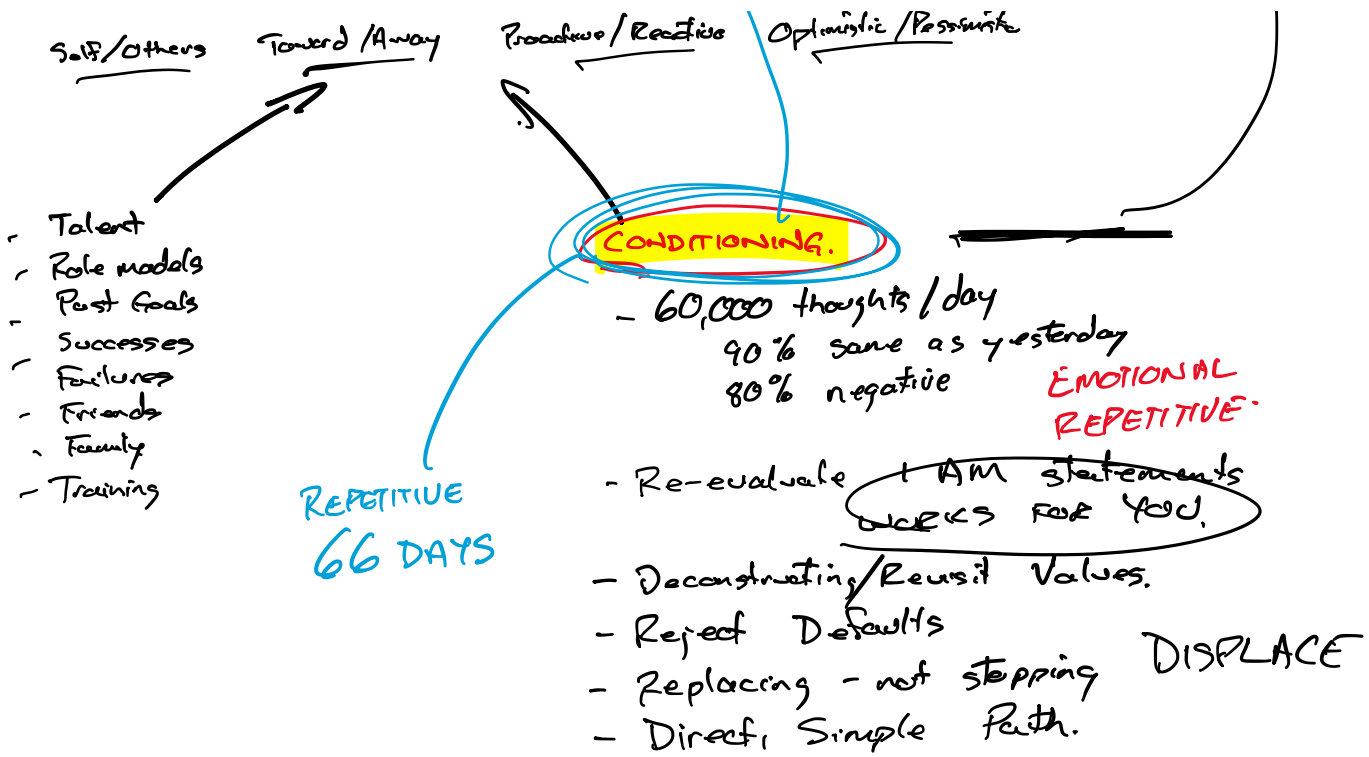
Thursday, April 4, 2019

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## THE EQUATION FOR RESULTS

~~$$\begin{aligned}
 \mathcal{L}_{SM} = & -\frac{1}{4} \partial_\mu g_\nu^\rho \partial_\mu g_\nu^\rho - g_\mu f^{abc} \partial_\mu g_\nu^\rho g_\nu^\rho g_\mu^\rho - \frac{1}{4} g^2 f^{abc} f^{ade} g_\mu^\rho g_\nu^\rho g_\mu^\rho - \partial_\mu W_\nu^\dagger \partial_\nu W_\mu - \\
 & M^2 W_\mu^\dagger W_\mu - \frac{1}{2} Z_\mu^\dagger \partial_\nu Z_\mu - \frac{1}{2} M^2 Z_\mu^\dagger Z_\mu - \frac{1}{2} \partial_\mu A_\nu \partial_\nu A_\mu - ig_{sw} (\partial_\mu W_\nu^\dagger W_\nu^\dagger - W_\nu^\dagger \partial_\mu W_\nu^\dagger) - \\
 & Z_\mu^\dagger (W_\nu^\dagger \partial_\nu W_\nu^\dagger - W_\nu^\dagger \partial_\nu W_\nu^\dagger) + Z_\mu^\dagger (W_\nu^\dagger \partial_\nu W_\nu^\dagger - W_\nu^\dagger \partial_\nu W_\nu^\dagger) - ig_{sw} (\partial_\mu A_\nu W_\nu^\dagger - W_\nu^\dagger \partial_\mu A_\nu) - \\
 & W_\nu^\dagger \partial_\nu W_\nu^\dagger - A_\mu W_\nu^\dagger \partial_\nu W_\nu^\dagger - W_\nu^\dagger \partial_\nu W_\nu^\dagger + A_\mu (W_\nu^\dagger \partial_\nu W_\nu^\dagger - W_\nu^\dagger \partial_\nu W_\nu^\dagger) - \\
 & \frac{1}{2} g^2 W_\nu^\dagger W_\nu^\dagger W_\nu^\dagger + \frac{1}{2} g^2 W_\nu^\dagger W_\nu^\dagger W_\nu^\dagger + g^2 s_w^2 (Z_\mu^\dagger W_\nu^\dagger \partial_\nu W_\nu^\dagger - W_\nu^\dagger \partial_\nu Z_\mu^\dagger W_\nu^\dagger) + \\
 & g^2 s_w^2 (A_\mu W_\nu^\dagger \partial_\nu W_\nu^\dagger - W_\nu^\dagger \partial_\nu A_\mu W_\nu^\dagger) + g^2 s_w c_w (A_\mu Z_\mu^\dagger (W_\nu^\dagger W_\nu^\dagger - W_\nu^\dagger \partial_\nu W_\nu^\dagger) - \\
 & 2A_\mu Z_\mu^\dagger W_\nu^\dagger W_\nu^\dagger) - \frac{1}{2} \partial_\mu H \partial_\mu H - 2M^2 \alpha_h H^2 - \partial_\mu \phi^\dagger \partial_\mu \phi - \frac{1}{2} \partial_\mu \phi^\dagger \partial_\nu \phi - \\
 & \beta_h \left( \frac{2M^2}{g} H + \frac{1}{2} (H^2 + \phi^\dagger \phi + \phi^\dagger \phi) \right) + \frac{2M^2}{g} \alpha_h - g v_h v (H^2 + H \phi^\dagger \phi + 2H \phi^\dagger \phi) - \\
 & \frac{1}{2} g^2 \alpha_h (H^4 + (\phi^\dagger \phi)^4 + 4(\phi^\dagger \phi)^2 \phi^\dagger \phi + 4H^2 \phi^\dagger \phi + 2(\phi^\dagger \phi)^2 H^2) - g M W_\mu^\dagger W_\mu H - \\
 & \frac{1}{2} g \frac{2g}{g} Z_\mu^\dagger Z_\mu H - \frac{1}{2} i g (W_\nu^\dagger (\phi^\dagger \partial_\nu \phi - \phi^\dagger \partial_\nu \phi) - W_\nu^\dagger (\phi^\dagger \partial_\nu \phi - \phi^\dagger \partial_\nu \phi)) + \\
 & \frac{1}{2} i g (W_\nu^\dagger (H \partial_\nu \phi - \phi^\dagger \partial_\nu H) + W_\nu^\dagger (H \partial_\nu \phi - \phi^\dagger \partial_\nu H)) + \frac{1}{2} g \frac{1}{2} (Z_\mu^\dagger (H \partial_\mu \phi - \phi^\dagger \partial_\mu H) + \\
 & M (\frac{1}{v_h} Z_\mu^\dagger \partial_\mu \phi + W_\mu^\dagger \partial_\mu \phi - W_\mu^\dagger \partial_\mu \phi) - ig_{sw} \frac{1}{2} Z_\mu^\dagger (W_\nu^\dagger \phi - W_\nu^\dagger \phi) + ig_{sw} M A_\mu (W_\nu^\dagger \phi - \\
 & W_\nu^\dagger \phi) - ig_{sw} \frac{2g}{g} Z_\mu^\dagger (\phi^\dagger \partial_\nu \phi - \phi^\dagger \partial_\nu \phi) + ig_{sw} A_\mu (\phi^\dagger \partial_\nu \phi - \phi^\dagger \partial_\nu \phi) - \\
 & \frac{1}{2} g^2 W_\mu^\dagger W_\mu (H^2 + (\phi^\dagger \phi)^2 + 2\phi^\dagger \phi) - ig_{sw} \frac{1}{2} Z_\mu^\dagger Z_\mu (H^2 + (\phi^\dagger \phi)^2 + 2(2s_w^2 - 1)^2 \phi^\dagger \phi) - \\
 & \frac{1}{2} g^2 \frac{2g}{g} Z_\mu^\dagger \phi^\dagger (W_\nu^\dagger \phi - W_\nu^\dagger \phi) - \frac{1}{2} ig_{sw} \frac{2g}{g} Z_\mu^\dagger H (W_\nu^\dagger \phi - W_\nu^\dagger \phi) + \frac{1}{2} g^2 s_w A_\mu \phi^\dagger (W_\nu^\dagger \phi - \\
 & W_\nu^\dagger \phi) + \frac{1}{2} i g^2 s_w A_\mu H (W_\nu^\dagger \phi - W_\nu^\dagger \phi) - g^2 \frac{2g}{g} (2c_w^2 - 1) Z_\mu^\dagger A_\mu \phi^\dagger \phi - g^2 s_w^2 A_\mu \phi^\dagger \phi - \\
 & \frac{1}{2} i g_s \lambda_{ij}^2 (\bar{u}_i \gamma^\mu \bar{u}_j) u_k^2 - \bar{e}^\dagger (\gamma^\mu + m_e^2) - \bar{\nu}^\dagger (\gamma^\mu + m_\nu^2) \nu^\dagger - \bar{u}_j^2 (\gamma^\mu + m_u^2) u_j^2 - \bar{d}_j^2 (\gamma^\mu + m_d^2) d_j^2 + \\
 & ig_{sw} A_\mu (-\bar{e}^\dagger \gamma^\mu e^\dagger) + \frac{2}{3} (\bar{u}_j^2 \gamma^\mu u_j^2) - \frac{1}{3} (\bar{d}_j^2 \gamma^\mu d_j^2) + \frac{ig_s}{2} Z_\mu^\dagger ((\bar{\nu}^\dagger \gamma^\mu (1 + \gamma^5) \nu^\dagger) + (\bar{e}^\dagger \gamma^\mu (4s_w^2 - \\
 & 1 - \gamma^5) e^\dagger) + (\bar{u}_j^2 \gamma^\mu (\frac{2}{3} s_w^2 - 1 - \gamma^5) u_j^2) + (\bar{d}_j^2 \gamma^\mu (1 - \frac{2}{3} s_w^2 - \gamma^5) d_j^2)) + \\
 & \frac{ig_s}{2} W_\mu^\dagger ((\bar{\nu}^\dagger \gamma^\mu (1 + \gamma^5) U^{lep} \lambda_{ek} e^\dagger) + (\bar{u}_j^2 \gamma^\mu (1 + \gamma^5) C_{jk} d_j^2) + \\
 & \frac{ig_s}{2\sqrt{2}} W_\mu^\dagger ((\bar{e}^\dagger U^{ep1} \lambda_{ek} \nu^\dagger (1 + \gamma^5) \nu^\dagger) + (\bar{d}_j^2 C_{jk}^1 \nu^\dagger (1 + \gamma^5) u_j^2) + \\
 & \frac{ig_s}{2M\sqrt{2}} \bar{\nu}^\dagger (-m_e^2 (\bar{\nu}^\dagger U^{lep} \lambda_{ek} (1 - \gamma^5) e^\dagger) + m_e^2 (\bar{\nu}^\dagger U^{lep} \lambda_{ek} (1 + \gamma^5) e^\dagger) + \\
 & \frac{ig_s}{2M\sqrt{2}} \bar{\nu}^\dagger (m_e^2 \bar{\nu}^\dagger U^{ep1} \lambda_{ek} (1 + \gamma^5) \nu^\dagger) - m_e^2 (\bar{\nu}^\dagger U^{ep1} \lambda_{ek} (1 - \gamma^5) \nu^\dagger) - \frac{g}{2M} H (\bar{\nu}^\dagger \nu^\dagger) + \\
 & \frac{g}{2M\sqrt{2}} H (\bar{\nu}^\dagger e^\dagger) + \frac{ig_s}{2M} \bar{\nu}^\dagger (\bar{\nu}^\dagger \gamma^5 \nu^\dagger) - \frac{ig_s}{2M} \bar{\nu}^\dagger (\bar{\nu}^\dagger \gamma^5 e^\dagger) - \frac{1}{4} \bar{\nu}_\lambda M_\lambda^2 (1 - \gamma_5) \nu_\lambda - \\
 & \frac{1}{4} \bar{\nu}_\lambda M_\lambda^2 (1 - \gamma_5) \nu_\lambda + \frac{ig_s}{2M\sqrt{2}} \bar{\nu}^\dagger (-m_d^2 (\bar{u}_j^2 C_{jk} (1 - \gamma^5) d_j^2) + m_d^2 (\bar{u}_j^2 C_{jk} (1 + \gamma^5) d_j^2) + \\
 & \frac{ig_s}{2M\sqrt{2}} \bar{\nu}^\dagger (m_d^2 (\bar{d}_j^2 C_{jk}^1 (1 + \gamma^5) u_j^2) - m_d^2 (\bar{d}_j^2 C_{jk}^1 (1 - \gamma^5) u_j^2) - \frac{g}{2M} H (\bar{u}_j^2 u_j^2) - \frac{g}{2M} H (\bar{d}_j^2 d_j^2) + \\
 & \frac{ig_s}{2M\sqrt{2}} \bar{\nu}^\dagger (\bar{u}_j^2 \gamma^5 u_j^2) - \frac{ig_s}{2M\sqrt{2}} \bar{\nu}^\dagger (\bar{d}_j^2 \gamma^5 d_j^2))
 \end{aligned}$$~~





Discipline:

- Regularly work at a thing until it regularly works on you.