$$\mu = \alpha + \beta_1 z_1 + \beta_2 z_2 + \varepsilon$$

$$H_0 : \Psi = \mu_F - \mu_P = 0$$

$$H_1 : \Psi \neq 0$$

$$a_A = (0, 1, -1)$$

$$c = 0 * \mu_C + 1 * \mu_F + (-1) * \mu_P$$

$$SE_C = s_p \sqrt{\frac{0}{15} + \frac{1}{15} + \frac{1}{15}}$$

$$t = \frac{c}{se_c}$$

$$H_0 : \Psi = \mu_C - \frac{\mu_F + \mu_P}{2} = 0$$

$$H_1 : \Psi \neq 0$$

$$c = \sum_{i=1} a_i \bar{y}_i \text{ estimates } \Psi$$

$$SE_C = s_p \sqrt{\sum_{i=1} \frac{a_i^2}{n_i}} = 9.208 \sqrt{\frac{1}{15} + \frac{0.25}{15} + \frac{0.25}{15}}$$

$$a = \left(1, -\frac{1}{2}, -\frac{1}{2}\right)$$

$$c = \bar{y}_C - \frac{\bar{y}_F}{2} - \frac{\bar{y}_P}{2}$$

$$\mu = \alpha + \beta_1 z_1 + \beta_2 AGE + \beta_3 HEIGHT + \beta_4 z_4 + \beta_5 z_5 + \varepsilon$$

$$\mu_A = \alpha \Rightarrow \mu_B = \alpha + \beta_1 = \mu_A + \beta_1 \Rightarrow \beta_1 = \mu_B - \mu_A$$

$$\text{and the same for } \beta_2 = \mu_C - \mu_A.$$

$$H_0 : \beta_1 = 0 \text{ and } \beta_2 = 0, \text{ which is equivalent to } \leftarrow \text{linear regression}$$

$$\mu_A = \mu_B \text{ and } \mu_A = \mu_C, \text{ which is equivalent to}$$

$$\mu_A = \mu_B = \mu_C \leftarrow ANOVA$$

$$VDIFF = \alpha + \beta * TREAT + \varepsilon$$

$$TREAT = 0, \text{if control}; = 1, \text{if treatment}$$

$$\mu = \alpha + \beta_1 \mu_C + \beta_2 \mu_T$$

$$\mu = \mu_C + \beta * TREAT = \mu_C + (\mu_T - \mu_C) * TREAT$$

$$H_0 : \mu_C = \mu_T$$

$$H_A : \mu_C < \mu_T$$

$$\mu_1 = \mu_2 = \dots = \mu_I$$

$$z_1 = GENDER$$

$$z_4 = DIET\ B$$

$$z_5 = DIET\ C$$

Reference group : females on diet A

$$df_T = df_E + df_G$$

$$n - 1 = (I - 1) + df_E \Rightarrow df_E = (n - 1) - (I - 1) = n - I$$