Poject2

Sunday, November 23, 2014

Summary

library(ggplot2) library(reshape) library(pander) data(ToothGrowth) ToothGrowth$dose <- factor(ToothGrowth$dose) names(ToothGrowth) <- c("Length", "Supplement", "Dosage") tg <- melt(ToothGrowth, id=c("Length"), variable_name="Var")

60 observations of tooth length given supplimental doses of Vitamin C. 3 Dosage levels of Vitamin C. 2 Supplement types. 10 observations each of 6 combinations. Mean <- c(mean(tg[, "Length"]) , mean(tg[tg$value == "OJ", "Length"]), mean(tg[tg$value == "VC", "Length"]), mean(tg[tg$value == "0.5", "Length"]), mean(tg[tg$value == "1", "Length"]), mean(tg[tg$value == "2", "Length"])
)

SD <- c(sd(tg[, "Length"]), sd(tg[tg$value == "OJ", "Length"]), sd(tg[tg$value == "VC", "Length"]), sd(tg[tg$value == "0.5", "Length"]), sd(tg[tg$value == "1", "Length"]) , sd(tg[tg$value == "2", "Length"]))

d <- data.frame(Mean, SD)

row.names(d) <- c("All", "Orange Juice", "Ascorbic Acid", "0.5 mg", "1.0 mg", "2.0 mg")

pandoc.table(d , style="rmarkdown", split.tables=900, caption="Tooth Lengths", justify="left" , round=2) theme_set(theme_bw(base_size = 8))

g <- ggplot(ToothGrowth, aes(x = Length)) + geom_histogram(aes(y = ..density..), binwidth=2.5, fill= 'firebrick', colour='black') + geom_density(colour="blue") + xlab("Tooth Length") + ylab("") + ggtitle("Distribution of Tooth Lengths") + theme(axis.ticks = element_blank(), axis.text.y = element_blank())

print(g)

ggplot(ToothGrowth, aes(x=interaction(Supplement,Dosage), y=Length,colour=Dosage)) + theme(axis.title.x=element_text(s colour="red")) + geom_boxplot() + xlab("") + ylab("") + ggtitle("By Dosage and Supplement Type") + guides(colour=FALSE) + scale_x_discrete(labels=c("OJ 0.5", "VC 0.5", "OJ 1.0", "VC 1.0","OJ 2.0", "VC 2.0")) ggplot(tg, aes(value, Length)) + geom_boxplot(aes(fill=value)) + geom_point(size=1.5) + facet_grid(.~Var, scales="free_x") + xlab("") + scale_fill_discrete(name="Group") + ylab("")
####Testing
h$Dosage <- factor(ToothGrowth$Dosage, levels=c("2", "1", "0.5"))

t.supplement.gt <- t.test(Length ~ Supplement , var.equal=F, ToothGrowth, alternative = "g") t.0.5v1.0 <- t.test(Length ~ Dosage, var.equal=T, subset(ToothGrowth, Dosage %in% c(0.5, 1.0)), alternative = "g") t.0.5v2.0 <- t.test(Length ~ Dosage, var.equal=T, subset(ToothGrowth, Dosage %in% c(0.5, 2.0)), alternative = "g") t.1.0v2.0 <- t.test(Length ~ Dosage, var.equal=T, subset(ToothGrowth, Dosage %in% c(1, 2)), alternative = "g") t.0.5 <- t.test(Length ~ Supplement, var.equal=T, subset(ToothGrowth, Dosage %in% c(0.5)), alternative = "g") t.1 <- t.test(Length ~ Supplement, var.equal=T, subset(ToothGrowth, Dosage %in% c(1)), alternative = "g") t.2 <- t.test(Length ~ Supplement, var.equal=F, subset(ToothGrowth, Dosage %in% c(2))) # alternative = "l")

t.stat <- c(t.supplement.gt$statistic, t.0.5v1.0statistic ,
t.1.0v2.0$statistic, t.0.5statistic , t.1$statistic, t.2statistic)

t.val <- c(t.supplement.gt$p.value, t.0.5v1.0p.value,
t.1.0v2.0$p.value, t.0.5p.value , t.1$p.value, t.2p.value)

t.conf1 <- c(t.supplement.gt$conf.int[1], t.0.5v1.0conf.int[1],
t.1.0v2.0$conf.int[1], t.0.5conf.int[1] , t.1$conf.int[1], t.2conf.int[1])

t.conf2 <- c(t.supplement.gt$conf.int[2], t.0.5v1.0conf.int[2],
t.1.0v2.0$conf.int[2], t.0.5conf.int[2] , t.1$conf.int[2], t.2conf.int[2])

the.tests <- data.frame(t.stat, t.val, t.conf1, t.conf2)

row.names(the.tests) <- c("1. VC < OJ", "2. 0.5 < 1.0", "3. 1.0 < 2.0" , "4. 0.5 VC < 0.5 OJ", "5. 1.0 VC < 1.0 OJ", "6. 2.0 VC != 2.0 OJ")

names(the.tests) <- c("t-value", "p-value", "Conf Int -", "- Conf Int")

pandoc.table(the.tests, style="rmarkdown", split.tables=900, caption="t-test results", justify="left" , round=9)

Higher doses of Vitamin C produce longer teeth.

Orange juice produces longer teeth than ascorbic acid.

At the 2.0mg dosage, the difference between orange juice and ascorbic acid evident at lower dosages disappears.