

PS01.fixedFormat

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```
# Problem 1
```

```
y <- c(105, 69, 86, 100, 82, 111, 104, 110, 87, 108, 87, 90, 94, 113, 112, 98, 80, 97, 95, 111, 114, 89)
```

```
# Question 1 - find the CI for the same student IQ scores 'y' given a 90% confidence interval
ci<-t.test(y, conf.level = 0.9)
ci
```

```
print("The 90% confidence interval for the sample student IQ scores with a confidence level of 90% is:".
(93.95993,102.92007)
```

```
# Question 2 - considering the national average IQ is 100, determine if the average student IQ score is
```

```
print("Null Hypothesis: The average student IQ score in the school is 100 (H0: u=100)")
```

```
print("Alternate hypothesis: The average student IQ score in the school is greater than 100 (HA: u>100)")
```

```
# As determining if IQ is greater than 100, use a one-tailed (right, so positive) t-test
```

```
hyp<-t.test(y, mu=100, alternative="greater", conf.level=0.95)
print(hyp)
```

```
print("P-value is 0.7215, the data does not have any statistical importance at the 95% confidence level")
```

```
# Problem 2
```

```
expenditure <- read.table("https://raw.githubusercontent.com/ASDS-TCD/StatsI_Fall2024/main/datasets/expenditure")
```

```
# Question 1 - examining the variables within expenditure for correlation.
```

```
library(corrplot)
str(expenditure)
numExp<-expenditure[sapply(expenditure, is.numeric)]
corRel<-cor(numExp)
corrplot(corRel)
```

```
print("We can see the strongest variable relationship correlation between X1(per capita personal income)
```

```
plot(numExp)
```

```

print("From the scatterplots generated, the relationships are all reflective of what the correlation pl

# Question 2 - Plotting the relationship between Y and Region:

plot(expenditure$Y,expenditure$Region)

# Which region has the highest per capita expenditure on housing assistance?

avRegion<-tapply(expenditure$Y, expenditure$Region, mean)
print(avRegion)

print("From this, we can see that region 4 has the highest average per capita expenditure on housing as

# Question 3 - Plot the graph between Y and X1,and describe the relationship

plot(expenditure$Y,expenditure$X1)

print("There is an increasing linear relationship between X1 and Y. We can see that in general that as

# Reproduce graph but include variable region, with it colour-coded and ustilising symbols to different

colour<-c("pink","purple","orange","green")[expenditure$Region]
symbol<-c(4,8,12,16)[expenditure$Region]
plot(expenditure$X1,expenditure$Y,
      col=colour, pch=symbol)

```