An article in the *Journal of the American Medical Association* reported on a randomized, comparative experiment in which 160 subjects were randomly assigned to one of four popular diet plans: Atkins, Ornish, Weight Watchers, and Zone (40 subjects per diet). These subjects were recruited through newspaper and television advertisements in the greater Boston area; all were overweight or obese with body mass index values between 27 and 42. Among the variables measured were:

- which diet the subject was assigned to
- whether or not the subject completed the twelve-month study
- the subject’s initial weight (in kilograms)
- the subject’s weight loss after twelve months (also in kilograms, with a negative value indicating weight gain)

Data for the 93 subjects who completed the 12-month study are in the Minitab worksheet *PopularDiets.mtw*, available from our course webpage.

a) For each of variables given in the bullet list above, classify it as categorical (also binary?) or quantitative.

b) Examine (submit) comparative boxplots of the weight loss amounts, comparing the four diet plans. Write a paragraph comparing and contrasting the distributions of weight loss across the four plans. [Remember to comment on center, variability, shape, and outliers.]

c) Report the sample mean and sample standard deviation of the weight loss amounts within each group.

d) Examine whether the technical conditions for ANOVA appear to be satisfied here. Comment on and justify your conclusion.

e) Use Minitab to perform an ANOVA to investigate whether the experimental data provide strong evidence that there is a significant difference in mean weight loss among these four diet plans. Report the ANOVA table, as well as the hypotheses, test statistic, and \( p \)-value. Summarize your conclusion.

f) For each diet plan, determine the sample proportion of subjects who completed the study. [Hint: Remember that 40 subjects were assigned at random to each diet plan, and the Minitab worksheet only contains data for the subjects who completed the study.]

g) Perform the appropriate test to determine if these proportions (your answer to the previous question) differ significantly. Report the hypotheses, test statistic, and \( p \)-value. Also summarize your conclusion.