**Statistician: Kelly Grenquist Version: P**

**Directions**

The final exam will consist of several application-type questions related to the following topics we’ve covered this semester – univariate EDA (quantitative & categorical), bivariate EDA (quantitative & categorical), linear regression, one-sample t-test, two-sample t-test, and chi-square. On the final exam, you will be asked to answer each question from results that you have prepared prior to the exam using R.

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**Data Set – Possum1**

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1. Univariate EDA for all variables [*excluding the “age” variable*].

2. Bivariate EDA for all pairs of quantitative variables. [*This may be done with one graph and one table.]*

3. Bivariate EDA for all pairs of categorical variables.

4. Linear regression results (equation results and r2) for predicting chest girth from total length.

5. Results for testing the following research hypotheses (use 5% level for each)

a. The mean tail length of possums is greater than 36 cm.

b. The mean chest diameter is different for possums captured from Victoria than for possums captured from “other” populations.

c. The mean belly girth is less for male than female possums.

d. The proportion of female possums differs between the two populations.

e. The mean age of female possums is greater than 3.

**Version: P Statistician: Kelly Grenquist**

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# **11 Steps for any Significance Test**

1. **[1]** state the rejection criterion (),

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3. **[1]** determine which hypothesis test to use – thoroughly explain why,

4. **[1]** collect the data (address type of study and randomization),

5. **[2]** check all necessary assumptions – explain how you tested the validity,

6. **[1]** calculate the appropriate statistic(s),

7. **[2]** calculate the appropriate test statistic,

8. **[2]** calculate the p‑value,

9. **[1]** state rejection decision,

10. **[2]\*** summarize your findings in terms of the problem, and

11. **[2]\* If reject H0,** compute a **100(1-)%** *confidence region* for the parameter.

**Questions:**

1. **[3pts]** Identify what type of variable each of the following is: foot length, sex, and chest girth.

2. **[5pts]\*** Perform a thorough EDA for the foot length of possums.

3. **[2pts]\*** Perform a thorough EDA for the sex of possums.

4. **[5pts]\*** Perform a thorough EDA for the relationship between total length and belly girth of possums.

5. **[2pts]\*** Interpret the slope of the linear regression that you performed.

6. **[2pts]** Predict the chest girth of a possum whose total length equals the median total length.

7. **[2pts]** What proportion of the total variability in chest girth is explained by knowing the total length?

8. **[15pts]** Test, at the 5% level, that the proportion of female possums differs between the two populations.

9. **[15 or 17 pts]** Test, at the 5% level, that the mean chest diameter is different for possums captured from Victoria than for possums captured from “other” populations.

10. **[8 pts]\*** Describe the importance of statistics (as a field of study or a collection of methods). Among other things make sure you describe the two major goals of statistics, identify at least three major concepts or ideas of statistics, and identify how some of the “tools” you have learned this semester illustrate or are related to why you think statistics is important.

**Statistician: Mary Hagen Version: P**

**Directions**

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e. The mean age of female possums is greater than 3.

**Version: P Statistician: Mary Hagen**

**Directions:**

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11. **[2]\* If reject H0,** compute a **100(1-)%** *confidence region* for the parameter.

**Questions:**

1. **[3pts]** Identify what type of variable each of the following is: foot length, sex, and chest girth.

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5. **[2pts]\*** Interpret the slope of the linear regression that you performed.

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**Statistician: Tess Kohoutek-Miller Version: P**

**Directions**

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**Version: P Statistician: Tess Kohoutek-Miller**

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**Statistician: Timothy Koski Version: P**

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**Questions:**

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**Statistician: Javier Lozano Version: P**

**Directions**

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**Data Set – Possum1**

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**Version: P Statistician: Javier Lozano**

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**Statistician: Ryan McDermott Version: P**

**Directions**

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d. The proportion of female possums differs between the two populations.

e. The mean age of female possums is greater than 3.

**Version: P Statistician: Ryan McDermott**

**Directions:**

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# **11 Steps for any Significance Test**

1. **[1]** state the rejection criterion (),

2. **[2]** state the null and alternative hypotheses to be tested – define the parameter,

3. **[1]** determine which hypothesis test to use – thoroughly explain why,

4. **[1]** collect the data (address type of study and randomization),

5. **[2]** check all necessary assumptions – explain how you tested the validity,

6. **[1]** calculate the appropriate statistic(s),

7. **[2]** calculate the appropriate test statistic,

8. **[2]** calculate the p‑value,

9. **[1]** state rejection decision,

10. **[2]\*** summarize your findings in terms of the problem, and

11. **[2]\* If reject H0,** compute a **100(1-)%** *confidence region* for the parameter.

**Questions:**

1. **[3pts]** Identify what type of variable each of the following is: foot length, sex, and chest girth.

2. **[5pts]\*** Perform a thorough EDA for the foot length of possums.

3. **[2pts]\*** Perform a thorough EDA for the sex of possums.

4. **[5pts]\*** Perform a thorough EDA for the relationship between total length and belly girth of possums.

5. **[2pts]\*** Interpret the slope of the linear regression that you performed.

6. **[2pts]** Predict the chest girth of a possum whose total length equals the median total length.

7. **[2pts]** What proportion of the total variability in chest girth is explained by knowing the total length?

8. **[15pts]** Test, at the 5% level, that the proportion of female possums differs between the two populations.

9. **[15 or 17 pts]** Test, at the 5% level, that the mean chest diameter is different for possums captured from Victoria than for possums captured from “other” populations.

10. **[8 pts]\*** Describe the importance of statistics (as a field of study or a collection of methods). Among other things make sure you describe the two major goals of statistics, identify at least three major concepts or ideas of statistics, and identify how some of the “tools” you have learned this semester illustrate or are related to why you think statistics is important.

**Statistician: Sarah Webber Version: P**

**Directions**

The final exam will consist of several application-type questions related to the following topics we’ve covered this semester – univariate EDA (quantitative & categorical), bivariate EDA (quantitative & categorical), linear regression, one-sample t-test, two-sample t-test, and chi-square. On the final exam, you will be asked to answer each question from results that you have prepared prior to the exam using R.

The dataset that you will examine is introduced below including actual questions that will be on the exam. You should load these data into R (from the class website) and create output that can be used to answer each question. Your R input and output should be printed and brought to the exam to be used to answer the exam questions.

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**Data Set – Possum1**

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1. Univariate EDA for all variables [*excluding the “age” variable*].

2. Bivariate EDA for all pairs of quantitative variables. [*This may be done with one graph and one table.]*

3. Bivariate EDA for all pairs of categorical variables.

4. Linear regression results (equation results and r2) for predicting chest girth from total length.

5. Results for testing the following research hypotheses (use 5% level for each)

a. The mean tail length of possums is greater than 36 cm.

b. The mean chest diameter is different for possums captured from Victoria than for possums captured from “other” populations.

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e. The mean age of female possums is greater than 3.

**Version: P Statistician: Sarah Webber**

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# **11 Steps for any Significance Test**

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3. **[1]** determine which hypothesis test to use – thoroughly explain why,

4. **[1]** collect the data (address type of study and randomization),

5. **[2]** check all necessary assumptions – explain how you tested the validity,

6. **[1]** calculate the appropriate statistic(s),

7. **[2]** calculate the appropriate test statistic,

8. **[2]** calculate the p‑value,

9. **[1]** state rejection decision,

10. **[2]\*** summarize your findings in terms of the problem, and

11. **[2]\* If reject H0,** compute a **100(1-)%** *confidence region* for the parameter.

**Questions:**

1. **[3pts]** Identify what type of variable each of the following is: foot length, sex, and chest girth.

2. **[5pts]\*** Perform a thorough EDA for the foot length of possums.

3. **[2pts]\*** Perform a thorough EDA for the sex of possums.

4. **[5pts]\*** Perform a thorough EDA for the relationship between total length and belly girth of possums.

5. **[2pts]\*** Interpret the slope of the linear regression that you performed.

6. **[2pts]** Predict the chest girth of a possum whose total length equals the median total length.

7. **[2pts]** What proportion of the total variability in chest girth is explained by knowing the total length?

8. **[15pts]** Test, at the 5% level, that the proportion of female possums differs between the two populations.

9. **[15 or 17 pts]** Test, at the 5% level, that the mean chest diameter is different for possums captured from Victoria than for possums captured from “other” populations.

10. **[8 pts]\*** Describe the importance of statistics (as a field of study or a collection of methods). Among other things make sure you describe the two major goals of statistics, identify at least three major concepts or ideas of statistics, and identify how some of the “tools” you have learned this semester illustrate or are related to why you think statistics is important.

**Statistician: Grant Ebert Version: P**

**Directions**

The final exam will consist of several application-type questions related to the following topics we’ve covered this semester – univariate EDA (quantitative & categorical), bivariate EDA (quantitative & categorical), linear regression, one-sample t-test, two-sample t-test, and chi-square. On the final exam, you will be asked to answer each question from results that you have prepared prior to the exam using R.

The dataset that you will examine is introduced below including actual questions that will be on the exam. You should load these data into R (from the class website) and create output that can be used to answer each question. Your R input and output should be printed and brought to the exam to be used to answer the exam questions.

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**Data Set – Possum1**

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a. The mean tail length of possums is greater than 36 cm.

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d. The proportion of female possums differs between the two populations.

e. The mean age of female possums is greater than 3.

**Version: P Statistician: Grant Ebert**

**Directions:**

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# **11 Steps for any Significance Test**

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2. **[2]** state the null and alternative hypotheses to be tested – define the parameter,

3. **[1]** determine which hypothesis test to use – thoroughly explain why,

4. **[1]** collect the data (address type of study and randomization),

5. **[2]** check all necessary assumptions – explain how you tested the validity,

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**Questions:**

1. **[3pts]** Identify what type of variable each of the following is: foot length, sex, and chest girth.

2. **[5pts]\*** Perform a thorough EDA for the foot length of possums.

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5. **[2pts]\*** Interpret the slope of the linear regression that you performed.

6. **[2pts]** Predict the chest girth of a possum whose total length equals the median total length.

7. **[2pts]** What proportion of the total variability in chest girth is explained by knowing the total length?

8. **[15pts]** Test, at the 5% level, that the proportion of female possums differs between the two populations.

9. **[15 or 17 pts]** Test, at the 5% level, that the mean chest diameter is different for possums captured from Victoria than for possums captured from “other” populations.

10. **[8 pts]\*** Describe the importance of statistics (as a field of study or a collection of methods). Among other things make sure you describe the two major goals of statistics, identify at least three major concepts or ideas of statistics, and identify how some of the “tools” you have learned this semester illustrate or are related to why you think statistics is important.

**Statistician: Alex Elliott Version: P**

**Directions**

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**Data Set – Possum1**

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5. Results for testing the following research hypotheses (use 5% level for each)

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c. The mean belly girth is less for male than female possums.

d. The proportion of female possums differs between the two populations.

e. The mean age of female possums is greater than 3.

**Version: P Statistician: Alex Elliott**

**Directions:**

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# **11 Steps for any Significance Test**

1. **[1]** state the rejection criterion (),

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11. **[2]\* If reject H0,** compute a **100(1-)%** *confidence region* for the parameter.

**Questions:**

1. **[3pts]** Identify what type of variable each of the following is: foot length, sex, and chest girth.

2. **[5pts]\*** Perform a thorough EDA for the foot length of possums.

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10. **[8 pts]\*** Describe the importance of statistics (as a field of study or a collection of methods). Among other things make sure you describe the two major goals of statistics, identify at least three major concepts or ideas of statistics, and identify how some of the “tools” you have learned this semester illustrate or are related to why you think statistics is important.

**Statistician: Austin Hogan Version: P**

**Directions**

The final exam will consist of several application-type questions related to the following topics we’ve covered this semester – univariate EDA (quantitative & categorical), bivariate EDA (quantitative & categorical), linear regression, one-sample t-test, two-sample t-test, and chi-square. On the final exam, you will be asked to answer each question from results that you have prepared prior to the exam using R.

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**Data Set – Possum1**

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**Version: P Statistician: Austin Hogan**

**Directions:**

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**Questions:**

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**Statistician: Josephine Mattern Version: P**

**Directions**

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**Data Set – Possum1**

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**Version: P Statistician: Josephine Mattern**

**Directions:**

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**Questions:**

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5. **[2pts]\*** Interpret the slope of the linear regression that you performed.

6. **[2pts]** Predict the chest girth of a possum whose total length equals the median total length.

7. **[2pts]** What proportion of the total variability in chest girth is explained by knowing the total length?

8. **[15pts]** Test, at the 5% level, that the proportion of female possums differs between the two populations.

9. **[15 or 17 pts]** Test, at the 5% level, that the mean chest diameter is different for possums captured from Victoria than for possums captured from “other” populations.

10. **[8 pts]\*** Describe the importance of statistics (as a field of study or a collection of methods). Among other things make sure you describe the two major goals of statistics, identify at least three major concepts or ideas of statistics, and identify how some of the “tools” you have learned this semester illustrate or are related to why you think statistics is important.

**Statistician: Alexander Patterson Version: P**

**Directions**

The final exam will consist of several application-type questions related to the following topics we’ve covered this semester – univariate EDA (quantitative & categorical), bivariate EDA (quantitative & categorical), linear regression, one-sample t-test, two-sample t-test, and chi-square. On the final exam, you will be asked to answer each question from results that you have prepared prior to the exam using R.

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**Data Set – Possum1**

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1. Univariate EDA for all variables [*excluding the “age” variable*].

2. Bivariate EDA for all pairs of quantitative variables. [*This may be done with one graph and one table.]*

3. Bivariate EDA for all pairs of categorical variables.

4. Linear regression results (equation results and r2) for predicting chest girth from total length.

5. Results for testing the following research hypotheses (use 5% level for each)

a. The mean tail length of possums is greater than 36 cm.

b. The mean chest diameter is different for possums captured from Victoria than for possums captured from “other” populations.

c. The mean belly girth is less for male than female possums.

d. The proportion of female possums differs between the two populations.

e. The mean age of female possums is greater than 3.

**Version: P Statistician: Alexander Patterson**

**Directions:**

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# **11 Steps for any Significance Test**

1. **[1]** state the rejection criterion (),

2. **[2]** state the null and alternative hypotheses to be tested – define the parameter,

3. **[1]** determine which hypothesis test to use – thoroughly explain why,

4. **[1]** collect the data (address type of study and randomization),

5. **[2]** check all necessary assumptions – explain how you tested the validity,

6. **[1]** calculate the appropriate statistic(s),

7. **[2]** calculate the appropriate test statistic,

8. **[2]** calculate the p‑value,

9. **[1]** state rejection decision,

10. **[2]\*** summarize your findings in terms of the problem, and

11. **[2]\* If reject H0,** compute a **100(1-)%** *confidence region* for the parameter.

**Questions:**

1. **[3pts]** Identify what type of variable each of the following is: foot length, sex, and chest girth.

2. **[5pts]\*** Perform a thorough EDA for the foot length of possums.

3. **[2pts]\*** Perform a thorough EDA for the sex of possums.

4. **[5pts]\*** Perform a thorough EDA for the relationship between total length and belly girth of possums.

5. **[2pts]\*** Interpret the slope of the linear regression that you performed.

6. **[2pts]** Predict the chest girth of a possum whose total length equals the median total length.

7. **[2pts]** What proportion of the total variability in chest girth is explained by knowing the total length?

8. **[15pts]** Test, at the 5% level, that the proportion of female possums differs between the two populations.

9. **[15 or 17 pts]** Test, at the 5% level, that the mean chest diameter is different for possums captured from Victoria than for possums captured from “other” populations.

10. **[8 pts]\*** Describe the importance of statistics (as a field of study or a collection of methods). Among other things make sure you describe the two major goals of statistics, identify at least three major concepts or ideas of statistics, and identify how some of the “tools” you have learned this semester illustrate or are related to why you think statistics is important.

**Statistician: Alexandra Ritchie Version: P**

**Directions**

The final exam will consist of several application-type questions related to the following topics we’ve covered this semester – univariate EDA (quantitative & categorical), bivariate EDA (quantitative & categorical), linear regression, one-sample t-test, two-sample t-test, and chi-square. On the final exam, you will be asked to answer each question from results that you have prepared prior to the exam using R.

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**Data Set – Possum1**

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1. Univariate EDA for all variables [*excluding the “age” variable*].

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3. Bivariate EDA for all pairs of categorical variables.

4. Linear regression results (equation results and r2) for predicting chest girth from total length.

5. Results for testing the following research hypotheses (use 5% level for each)

a. The mean tail length of possums is greater than 36 cm.

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c. The mean belly girth is less for male than female possums.

d. The proportion of female possums differs between the two populations.

e. The mean age of female possums is greater than 3.

**Version: P Statistician: Alexandra Ritchie**

**Directions:**

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# **11 Steps for any Significance Test**

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9. **[1]** state rejection decision,

10. **[2]\*** summarize your findings in terms of the problem, and

11. **[2]\* If reject H0,** compute a **100(1-)%** *confidence region* for the parameter.

**Questions:**

1. **[3pts]** Identify what type of variable each of the following is: foot length, sex, and chest girth.

2. **[5pts]\*** Perform a thorough EDA for the foot length of possums.

3. **[2pts]\*** Perform a thorough EDA for the sex of possums.

4. **[5pts]\*** Perform a thorough EDA for the relationship between total length and belly girth of possums.

5. **[2pts]\*** Interpret the slope of the linear regression that you performed.

6. **[2pts]** Predict the chest girth of a possum whose total length equals the median total length.

7. **[2pts]** What proportion of the total variability in chest girth is explained by knowing the total length?

8. **[15pts]** Test, at the 5% level, that the proportion of female possums differs between the two populations.

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10. **[8 pts]\*** Describe the importance of statistics (as a field of study or a collection of methods). Among other things make sure you describe the two major goals of statistics, identify at least three major concepts or ideas of statistics, and identify how some of the “tools” you have learned this semester illustrate or are related to why you think statistics is important.

**Statistician: Travis Sherlin Version: P**

**Directions**

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**Data Set – Possum1**

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d. The proportion of female possums differs between the two populations.

e. The mean age of female possums is greater than 3.

**Version: P Statistician: Travis Sherlin**

**Directions:**

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# **11 Steps for any Significance Test**

1. **[1]** state the rejection criterion (),

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3. **[1]** determine which hypothesis test to use – thoroughly explain why,

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11. **[2]\* If reject H0,** compute a **100(1-)%** *confidence region* for the parameter.

**Questions:**

1. **[3pts]** Identify what type of variable each of the following is: foot length, sex, and chest girth.

2. **[5pts]\*** Perform a thorough EDA for the foot length of possums.

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10. **[8 pts]\*** Describe the importance of statistics (as a field of study or a collection of methods). Among other things make sure you describe the two major goals of statistics, identify at least three major concepts or ideas of statistics, and identify how some of the “tools” you have learned this semester illustrate or are related to why you think statistics is important.

**Statistician: Michael Sinclair Version: P**

**Directions**

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**Data Set – Possum1**

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e. The mean age of female possums is greater than 3.

**Version: P Statistician: Michael Sinclair**

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**Questions:**

1. **[3pts]** Identify what type of variable each of the following is: foot length, sex, and chest girth.

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**Statistician: Sarah Tocko Version: P**

**Directions**

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**Data Set – Possum1**

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**Version: P Statistician: Sarah Tocko**

**Directions:**

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**Questions:**

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