**Quiz 3 - Linear Regression**

Consider the dataset “crab.csv”, where we are interested in the variable 'satell' (the number of male crabs grouped around a female horseshoe crab during the mating season, also known as satellites). Various linear models were built using the following regressors:

1. **weight: the weight of the female crab**(kg)
2. **width: the width of the crab** (cm)
3. **color**(where 2 = light, 3 = medium, 4 = dark, 5 = darker)

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| **Question 1**  How many coefficients are required to represent variable color in a linear model when it is a categorical variable? | |
| A | 1 |
| B | 2 |
| C | 3 |
| D | 4 |

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| **Question 2**  Note: attach(df) is a command that tells R to create new vectors by duplicating each column of "df". In other words, when this command is run, R will create as many vectors as the number of columns in "df". Each vector created is exactly the same as each column in "df" with the same name and same property (quantitative/categorical). However, those vectors created are OUTSIDE of the data frame "df".  The code snippet provided is run in sequence. Which of the following models treat color as a categorical variable?  A screenshot of a computer program  Description automatically generated | |
| A | M1 and M4 |
| B | M1, M3 and M4 |
| C | M2 and M3 |
| D | All of them |

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| **Question 3**  The coefficient for weight was found to be 1.69. Select the correct interpretation. | |
| A | For every 1kg increase in weight, satell increases by 1.69 |
| B | For every 1.69 increase in weight, satell increases by 1 |
| C | For every 1kg increase in weight, satell increases by a factor of 1.69 |
| D | The correlation coefficient of weight and satell is 1.69 |

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| **Question 4**  Select all the correct statements that apply when this code is executed.  **A computer code with text  Description automatically generated with medium confidence** | |
| A | Line 4 will not create a linear model |
| B | Line 7 will output a single prediction |
| C | Line 8 will produce an error |
| D | Line 8 will output multiple predictions |

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| **Question 5**  True or False? This code predicts the number of satellites for a dark crab weighing 2.6kg.A close-up of a math equation  Description automatically generated | |
| A | True |
| B | False |