

# MA103: Mathematical Modeling & Intro to Calculus

## Modeling with Descriptive Analytics 1

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**Lesson Objectives:** Cadets will

1. understand the types of questions that can be modeled with descriptive statistics.
  2. understand how to apply the modeling triangle using descriptive statistics.
  3. identify and justify assumptions.
  4. identify modeling decisions.
  5. apply the MA103 ethical framework to assess modeling decisions.
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## 1 Admin Notes

- Instructor Website
- Office location
- Bonus Point sign-up: the link is good
- More Bonus Points: MA103 3-ring binder and folder on computer

**Descriptive Statistics:**

**Assumptions and Modeling Decisions:**

- data dictionary
- data cleaning

**Exercise:** at boards with a partner, create a data dictionary for the following data. Identify records that need to be cleaned by the record ID. Note any assumptions you must make to clean each record.

1. **Types of Variables:**

a. **Numerical**

- i.
- ii.

b. **Categorical**

- i.

ID	SDC	MDL	Run	Age
2901	124	225	15:30	18
2902	110	275	14:45	20
2903	130	0	970	210
2904	118	250	14:30	21
2905	105	300	13:50	19
2906	140	185	17:00	19
2907	11	265	15:00	22

ii.

iii.

## 2. Data Dictionary:

### Dataset Data Dictionary

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Variable	Description (include type, units, range)
ID	
SDC	
MDL	
RUN	
Age	

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What are some questions we could ask about the "french fry" problem?

#### \*Helpful Excel Commands:

- Minimum: =min()
- Maximum: =max()
- Lock a Cell: \$A\$1