Machine Learning pa1

CAPP 30254

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**Problem A**

1.

Field Name: First\_name

Mode: Amy

Missing Value Count: 0

Field Name: Last\_name

Mode: Ross

Missing Value Count: 0

Field Name: State

Mode: Texas

Missing Value Count: 116

Field Name: Gender

Mode: Female

Missing Value Count: 226

Field Name: Age

Mean: 17.0

Standard Deviation: 1.46

Median: 17.0

Mode: 15

Missing Value Count: 229

Field Name: GPA

Mean: 2.99

Standard Deviation: 0.82

Median: 3.0

Mode: 2

Missing Value Count: 221

Field Name: Days\_missed

Mean: 18.01

Standard Deviation: 9.63

Median: 18.0

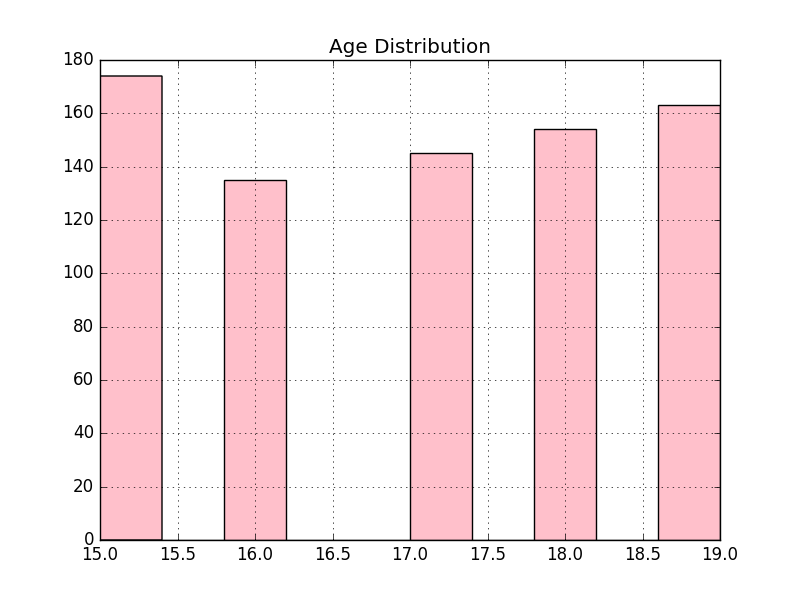
Mode: 6 14 31

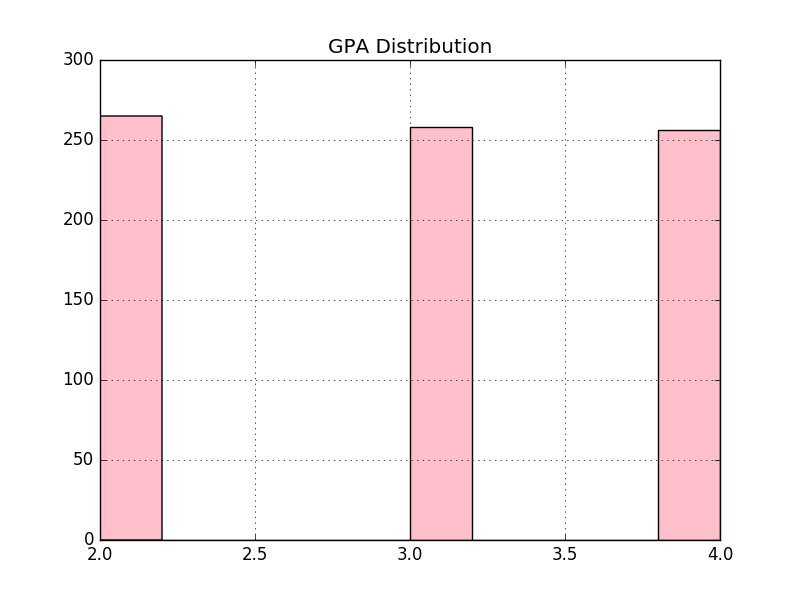
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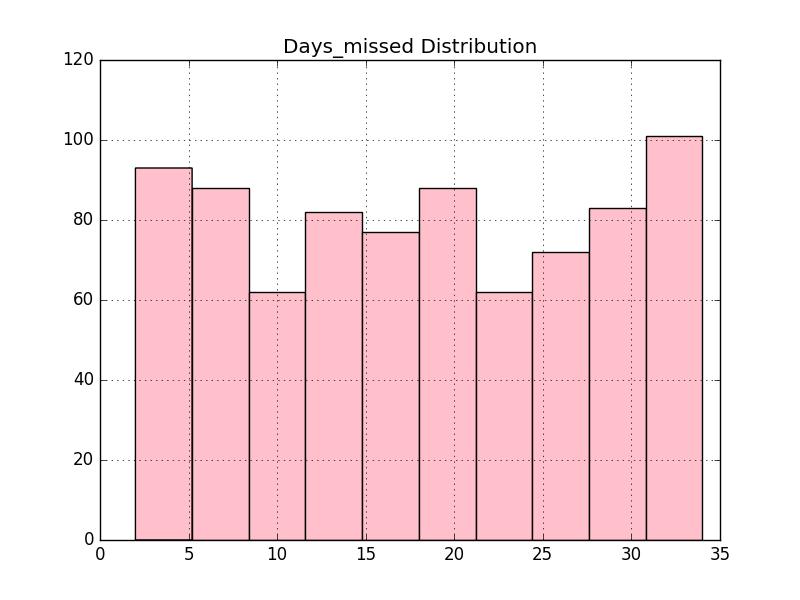
Field Name: Graduated

Mode: Yes

Missing Value Count: 0







**Problem B**

1. Cannot tell based on the information provided. In order to infer the comparison of Chris and David from a logistic regression model with polynomial explanatory variables, we need more information on their other characteristics.
2. African American male students are more likely to graduate compared to African American male students and non African American students (including all gender). This implies that African American males are less likely to not graduate compared to African American females and non-African American males.
3. The effect of age on the probability of graduation depends on one’s age. Specifically, in this model, the variables age and age squared allow age to have a quadratic effect on the likelihood of graduation – below a threshold, an increase of age is associated with a decrease in graduation probability; above that threshold, an increase of age is associated with an increase in graduation probability. However, our analysis output indicates that both coefficients are insignificant; thus, there is not much information we can draw from it. In fact, a joint hypothesis has to be employment
4. One might argue dropping male or female. However, because to show the gender effect, one of them should be left out as a base case. I would need more information about the categories of gender, i.e. whether there are more categories other than female and male, if yes, the model existing is appropriate; otherwise, I will drop one of the two variables: female or male. Moreover, since both age and age squared are insignificant, I will drop them and run the model.