

# Predicting Love at First Sight

**Lisa VanderVoort**

# Pop culture is saturated with the idea of love at first sight.

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*The* **BACHELOR**

*The* **BACHELORETTE**

# Love at First 4 Minutes

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**Data**: Speed Dating Experiment dataset from Kaggle

**Participant Information**: 551 Heterosexual men and women who attended 21 different speed dating events from 2002-2004

**Targets**:

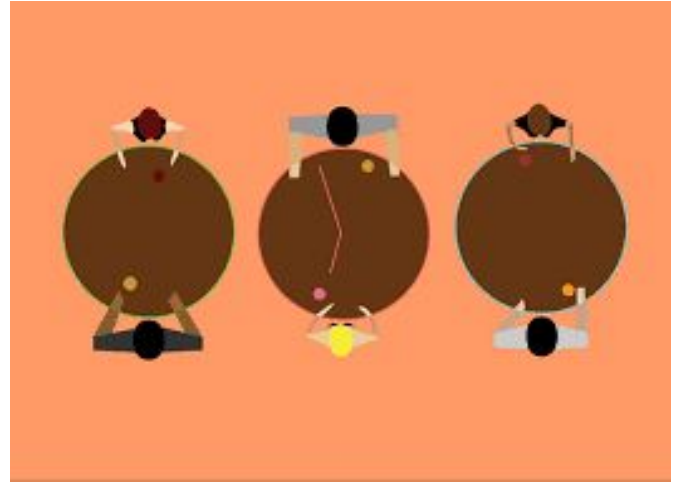


Match in a round  
of speed dating



Attend a date with a  
match after event

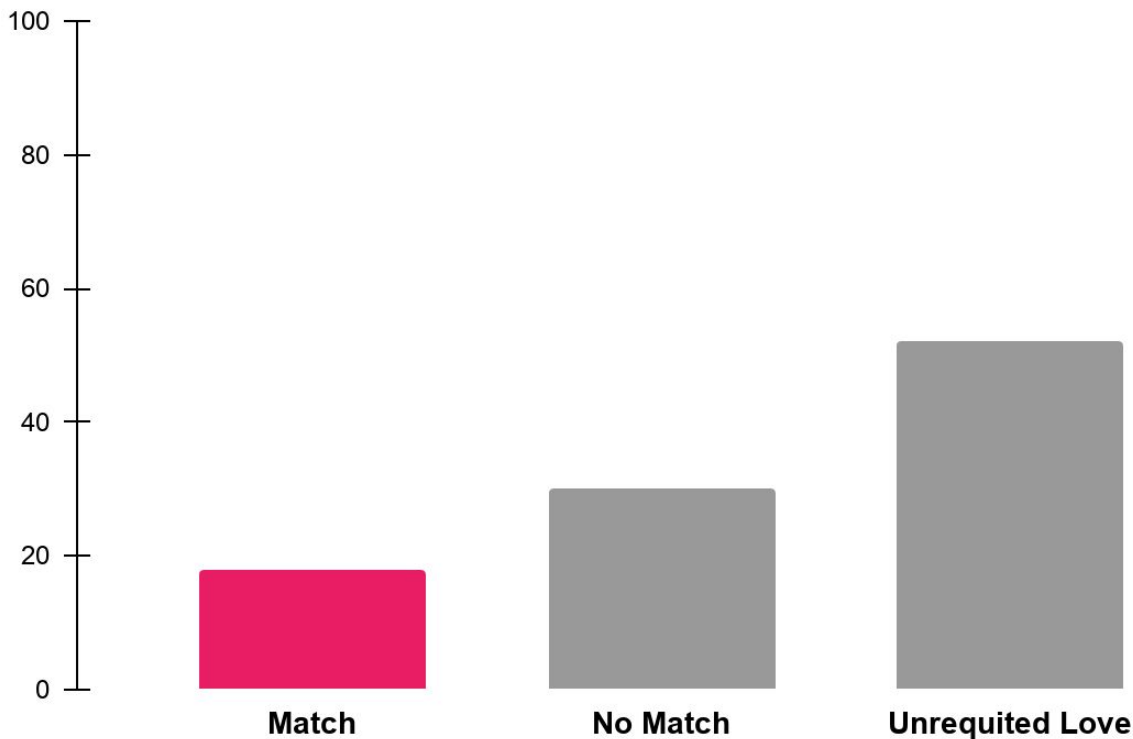
# Match in a Round of Speed Dating



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**Of the 5,456 four-minute rounds, only 18% ended in a match.**

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# Optimized Logistic Regression for ROC AUC (0.79)

	1	2	3	4
Decision	yes no	yes no	yes no	yes no
Attributes				
Attractive				
Sincere				
Intelligent				
Fun				
Ambitious				
Shared Interests/Hobbies				
Overall, how much do you like this person? (1=don't like at all, 10=like a lot)				
How probable do you think it is that this person will say 'yes' for you? (1=not probable, 10=extremely probable)				

**Feature Engineering:**  
Sum of absolute value of ratings differences between you and your partner in a round

# Impact of the Features on a Match

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Feature	Increase in score by...	Change in Odds of Matching
Attractive	1.95 points	35% Increase
Fun	1.95 points	25% Increase
Shared Interests/Hobbies	2.15 points	28% Increase
Like	1.84 points	91% Increase
Sum of absolute values of ratings differences	7.52 points	47% Decrease

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# Predicting a Date After Speed Dating

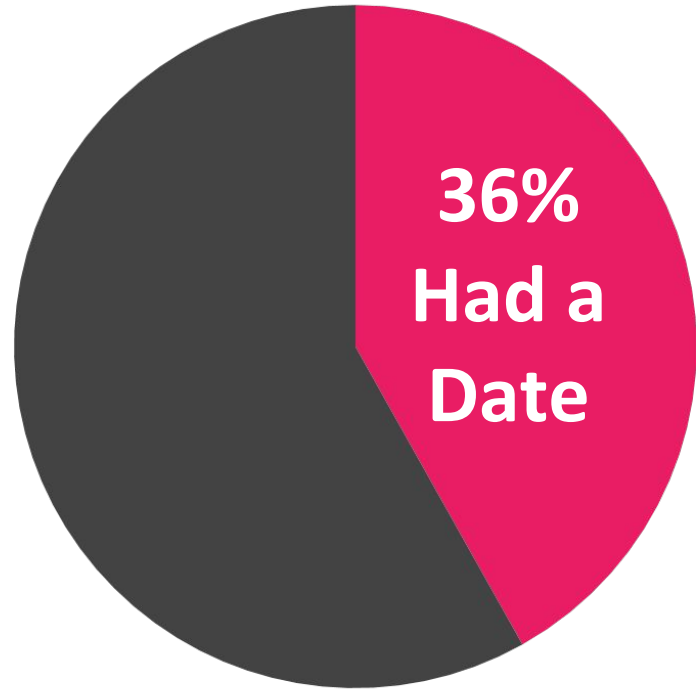


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# Much Smaller Sample Size

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223 out of the original  
551 participants  
completed a follow-up  
survey about the speed  
dating event.



# Participants were asked questions about their...

## Interests

- ☐ Sports
- ☐ Watching sports
- ☐ Exercise
- ☐ Dining out
- ☐ Museums/galleries
- ☐ Art
- ☐ Hiking/camping
- ☐ Gaming
- ☐ Dancing/clubbing
- ☐ Reading
- ☐ Watching TV
- ☐ Theater
- ☐ Movies
- ☐ Going to concerts
- ☐ Music
- ☐ Shopping
- ☐ Yoga/meditation

# Participants were asked questions about their...

Interests	Beliefs
<ul style="list-style-type: none"><li><input type="checkbox"/> Sports</li><li><input type="checkbox"/> Watching sports</li><li><input type="checkbox"/> Exercise</li><li><input type="checkbox"/> Dining out</li><li><input type="checkbox"/> Museums/galleries</li><li><input type="checkbox"/> Art</li><li><input type="checkbox"/> Hiking/camping</li><li><input type="checkbox"/> Gaming</li><li><input type="checkbox"/> Dancing/clubbing</li><li><input type="checkbox"/> Reading</li><li><input type="checkbox"/> Watching TV</li><li><input type="checkbox"/> Theater</li><li><input type="checkbox"/> Movies</li><li><input type="checkbox"/> Going to concerts</li><li><input type="checkbox"/> Music</li><li><input type="checkbox"/> Shopping</li><li><input type="checkbox"/> Yoga/meditation</li></ul>	<ul style="list-style-type: none"><li><input type="checkbox"/> How important is it to you that a person you date be of the same racial/ethnic background?</li><li><input type="checkbox"/> How important is it to you that a person you date be of the same religious background?</li></ul>

# Participants were asked questions about their...

Interests	Beliefs	Lifestyle
<ul style="list-style-type: none"><li><input type="checkbox"/> Sports</li><li><input type="checkbox"/> Watching sports</li><li><input type="checkbox"/> Exercise</li><li><input type="checkbox"/> Dining out</li><li><input type="checkbox"/> Museums/galleries</li><li><input type="checkbox"/> Art</li><li><input type="checkbox"/> Hiking/camping</li><li><input type="checkbox"/> Gaming</li><li><input type="checkbox"/> Dancing/clubbing</li><li><input type="checkbox"/> Reading</li><li><input type="checkbox"/> Watching TV</li><li><input type="checkbox"/> Theater</li><li><input type="checkbox"/> Movies</li><li><input type="checkbox"/> Going to concerts</li><li><input type="checkbox"/> Music</li><li><input type="checkbox"/> Shopping</li><li><input type="checkbox"/> Yoga/meditation</li></ul>	<ul style="list-style-type: none"><li><input type="checkbox"/> How important is it to you that a person you date be of the same racial/ethnic background?</li><li><input type="checkbox"/> How important is it to you that a person you date be of the same religious background?</li></ul>	<ul style="list-style-type: none"><li><input type="checkbox"/> How frequently do you go on dates?</li><li><input type="checkbox"/> How often do you go out (not necessarily on dates)?</li></ul>

# Participants were asked questions about their...

Interests	Beliefs	Lifestyle	Self Perception
<ul style="list-style-type: none"><li><input type="checkbox"/> Sports</li><li><input type="checkbox"/> Watching sports</li><li><input type="checkbox"/> Exercise</li><li><input type="checkbox"/> Dining out</li><li><input type="checkbox"/> Museums/galleries</li><li><input type="checkbox"/> Art</li><li><input type="checkbox"/> Hiking/camping</li><li><input type="checkbox"/> Gaming</li><li><input type="checkbox"/> Dancing/clubbing</li><li><input type="checkbox"/> Reading</li><li><input type="checkbox"/> Watching TV</li><li><input type="checkbox"/> Theater</li><li><input type="checkbox"/> Movies</li><li><input type="checkbox"/> Going to concerts</li><li><input type="checkbox"/> Music</li><li><input type="checkbox"/> Shopping</li><li><input type="checkbox"/> Yoga/meditation</li></ul>	<ul style="list-style-type: none"><li><input type="checkbox"/> How important is it to you that a person you date be of the same racial/ethnic background?</li><li><input type="checkbox"/> How important is it to you that a person you date be of the same religious background?</li></ul>	<ul style="list-style-type: none"><li><input type="checkbox"/> How frequently do you go on dates?</li><li><input type="checkbox"/> How often do you go out (not necessarily on dates)?</li></ul>	<ul style="list-style-type: none"><li><input type="checkbox"/> Sincere</li><li><input type="checkbox"/> Intelligent</li><li><input type="checkbox"/> Fun</li><li><input type="checkbox"/> Attractive</li><li><input type="checkbox"/> Ambitious</li><li><input type="checkbox"/> # of matches expected to receive</li></ul>

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# Feature engineering provided improved optimization of ROC AUC (0.65) for Random Forest Model.

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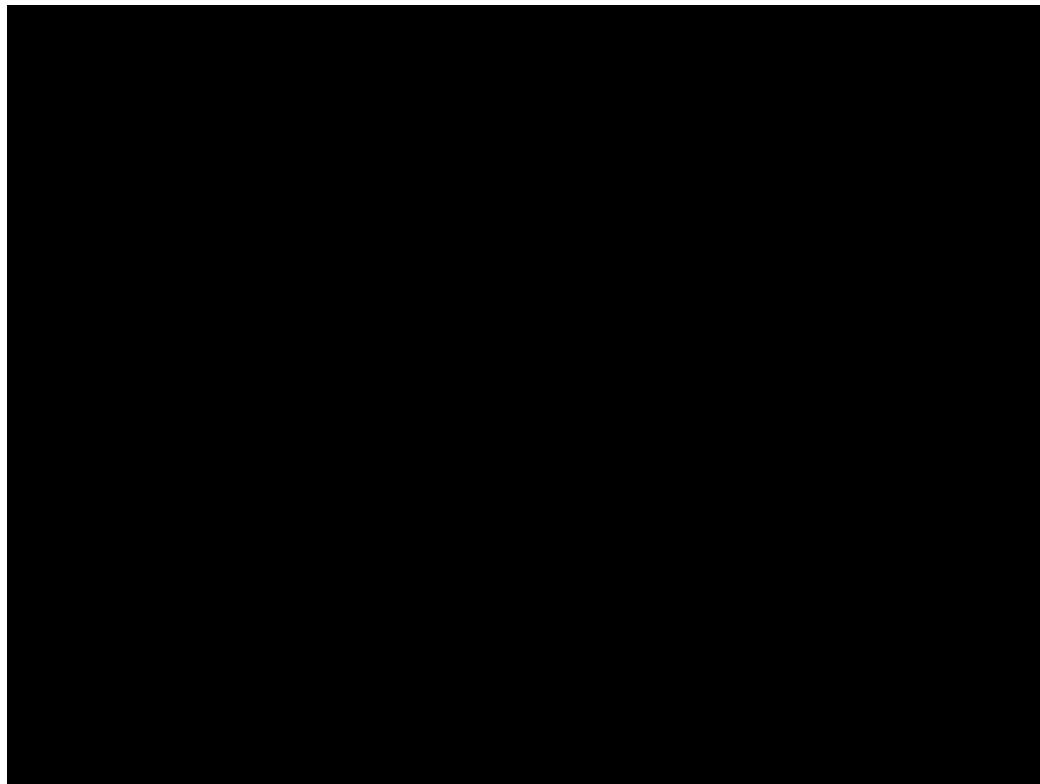
# Most Impactful Features

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Rated Lower	Rated Higher
TV Oriented Activities Culture Activities <b>Race Importance</b>	Active Activities Confidence

**Let's see if Ruth will have a date!**

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# Conclusions

- ❑ Predicting human behavior around love and attraction is complex
- ❑ First impressions make a difference!
  - ❑ The more similar yours and a date's perception of each other, the greater the odds of matching
  - ❑ The more you initially like a person, the greater the odds of matching are
- ❑ Confidence and physical activity can have a positive impact on getting a follow-up date after a speed dating event

Questions?

# Appendix

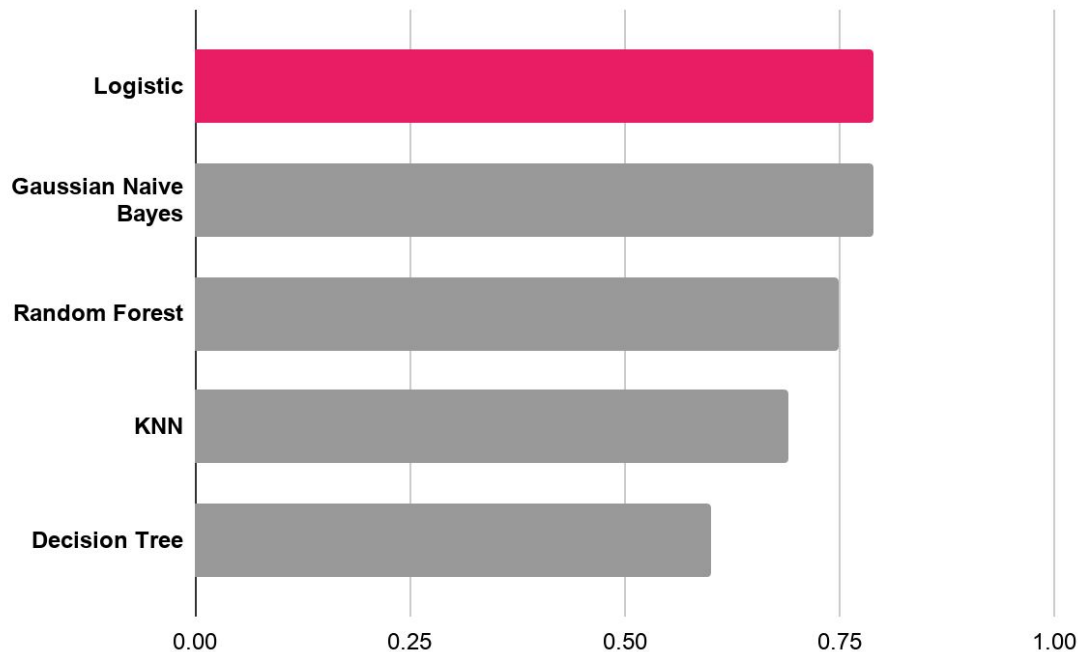
# Participant Scorecard

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	1	2	3	4
Decision	yes no	yes no	yes no	yes no
Attributes				
Attractive				
Sincere				
Intelligent				
Fun				
Ambitious				
Shared Interests/Hobbies				
Overall, how much do you like this person? (1=don't like at all, 10=like a lot)				
How probable do you think it is that this person will say 'yes' for you? (1=not probable, 10=extremely probable)				

Participants rated each date on the following attributes on a scale of 1 (awful) to 10 (great).

# Match in a Round of Speed Dating

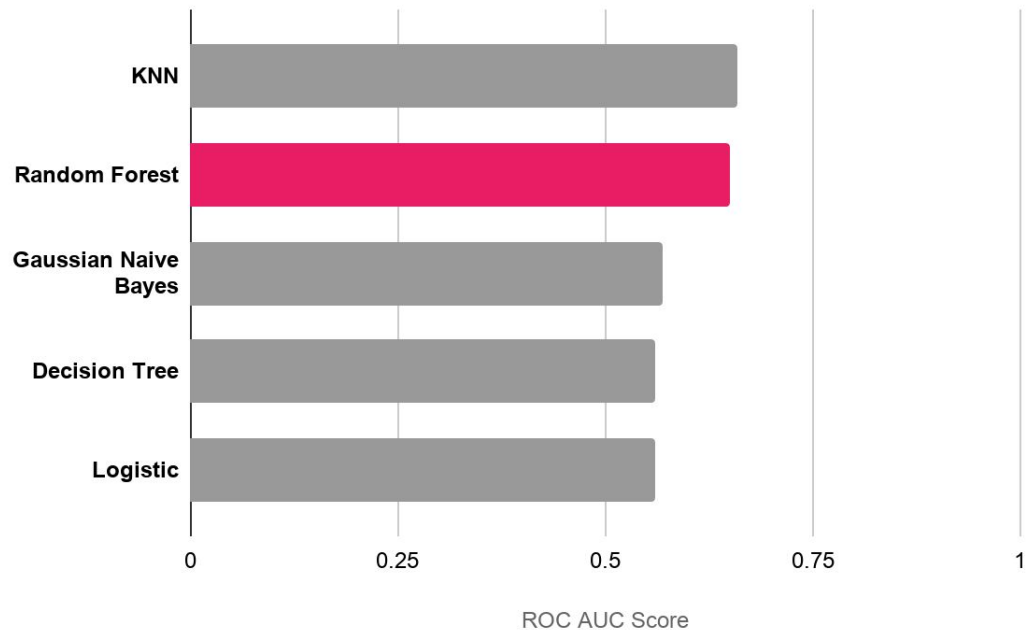


Logistic Regression was chosen for optimizing ROC AUC score (pictured) and still maintaining accuracy (84%) compared to Gaussian Naive Bayes.



# Attend a Date with a Match After Event

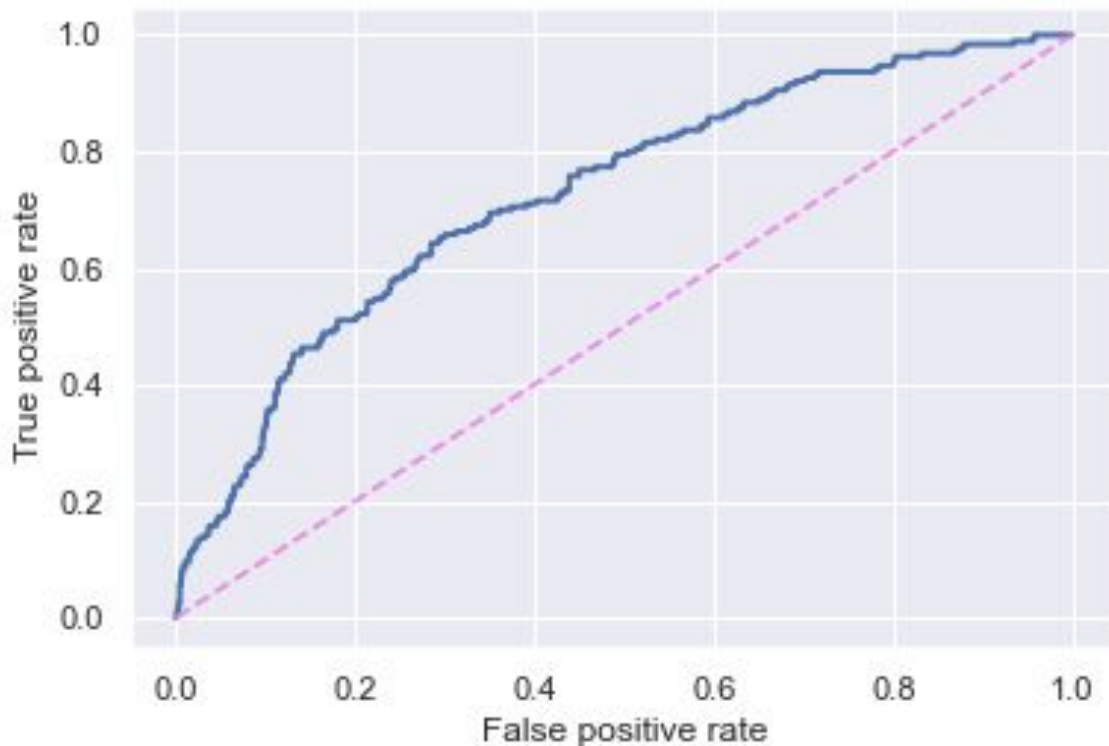
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Random Forest was chosen for nearly optimizing ROC AUC score (0.01 less than KNN), maintained higher accuracy (56%) as compared to KNN.

# Optimized Logistic Regression for ROC AUC (0.79)

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# Higher interest/importance/frequency mean...

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Less likely to match	More likely to match
TV Oriented Activities Culture Activities Social Activities Religious Importance Race Importance Race Importance <sup>2</sup>	Active Activities Match Estimate Confidence Self Sincere Self Intelligent Sociableness**

*\*\*The scale for Date Frequency and Going Out Frequency was out of 7 and a higher score indicated less frequency.*

# Most Impactful Features

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*\*\*Not drawn to scale*

# Most Impactful Features

— — —



*\*\*Not drawn to scale*

# Confusion Matrix Shows Limitations of Small Sample Size

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	Predicted No Date	Predicted Date
Actual No Date	21	8
Actual Date	12	4

# Most Impactful Features

— — —

Less likely to match	More likely to match
TV Oriented Activities Culture Activities	Active Activities Confidence