

# Predicting Rock Climbing Performance

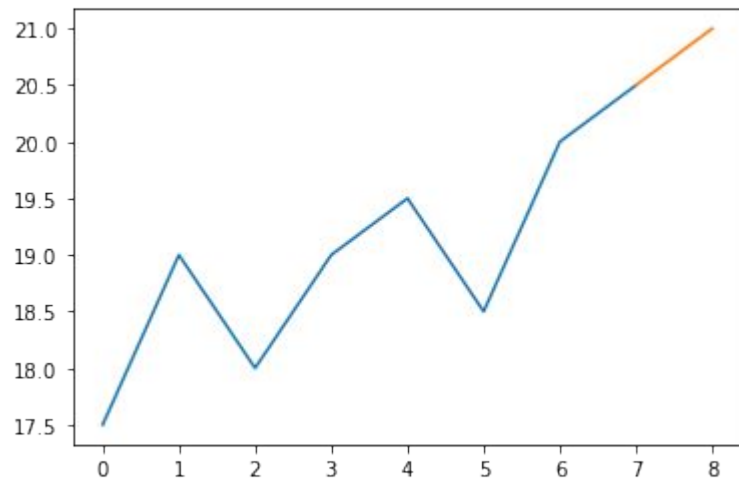
by Kaitlyn Zeichick



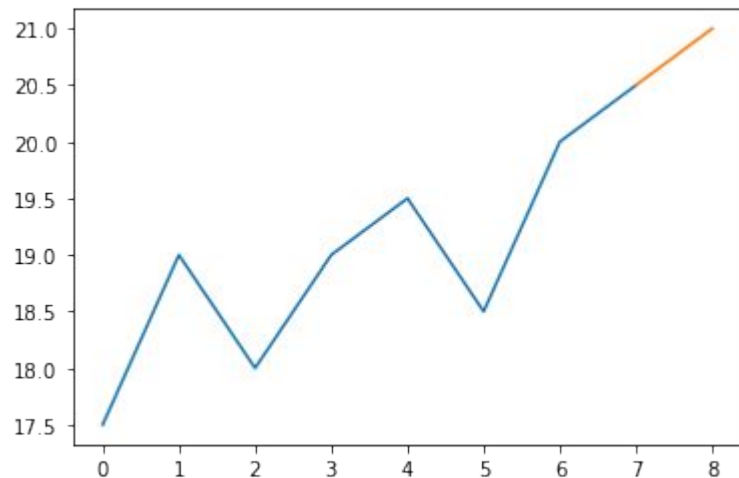
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# Context

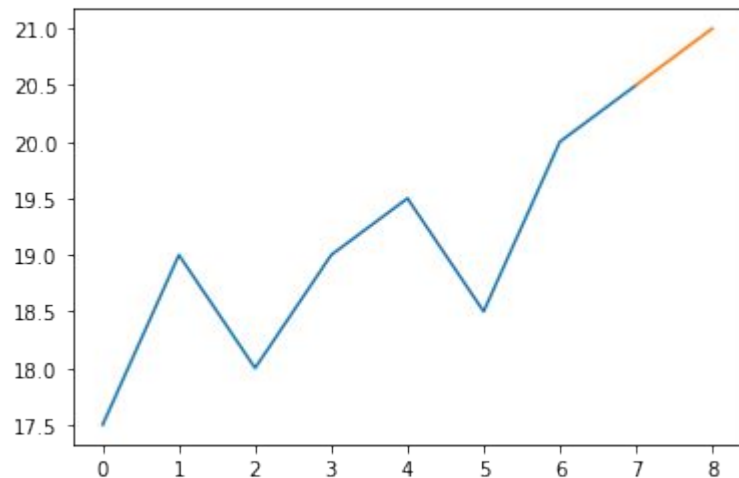


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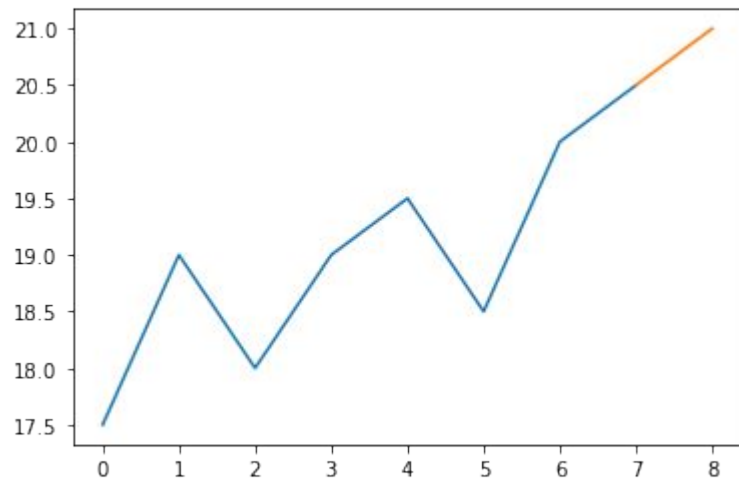




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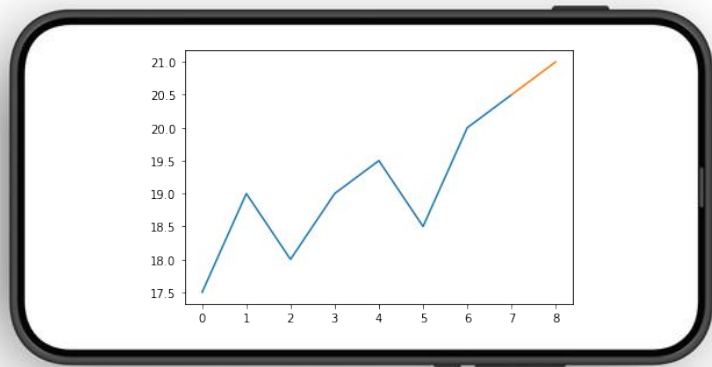


# Context








# Context





# Data

- 3,960 users
- 514,921 rows of data

 **MOUNTAIN PROJECT**

Route GuideGymsWhat's NewPartnersForum

Search routes, forums, etc 








## Partner Finder

Found 500 possible partners who:

- live within 25 miles of 80302

[« Change search](#)

Name	Vitals	Climbs	Best Times	Other Interests	More
 <b>Dane B</b> Last visit: moments ago	Boulder, CO Male, 36 Trad, Sport, Gym	Trad: leads 5.11a, follows 5.12a Sport: leads 5.12d, follows 4th Boulders: V6			<b>To-Dos in Common:</b> Tribal Boundaries 5.10a/b   The Scepter 5.10a   South Face 5.8   Jupiter Crack 5.11   Joy of Heresy 5.11d   Cocaine Rodeo 5.12a
 <b>Nathan Sandidge</b> Last visit: moments ago	Denver, CO Male, 29 Trad, Sport, TR, Gym	Trad: leads 5.9, follows 5.10c Sport: leads 5.11d, follows 5.12b Ice: leads WI2, follows WI5 Mixed: leads M2, follows M4 Boulders: V5	Any		<b>To-Dos in Common:</b> Southeast Face 5.10c   Thunderbolt to Sill Traverse 5.9 Easy Snow   Cocaine Rodeo 5.12a   Dream of Wild Turkeys 5.10a   Black Dagger 5.8 PG13   Unimpeachable Groping 5.10b
 <b>mtoensing</b> Last visit: 3 mins ago	Boulder Male, 32 Trad	Trad: leads 5.11b, follows 5.11d		Music	
 <b>Saaraa</b> Last visit: 5 mins ago	Boulder CO Female, 37 Trad, Sport, Gym	Trad: leads 5.8, follows 5.11a Sport: leads 5.11c, follows 5.12a			
 <b>Giles Eperon</b> Last visit: 8 mins ago	Golden, CO Male, 33 Trad, Sport, TR, Gym	Trad: leads 5.11a, follows 5.11b Sport: leads 5.11c, follows 5.11d Ice: leads WI4, follows WI5	after work, weekends or sneaky days off	Skiing, backpacking, camping... board games and post adventure beverages	<b>To-Dos in Common:</b> West Ridge 5.6   Exum Ridge 5.5   CMC Route 5.5   Wham Ridge 5.4 R   South Face 5.8   North East Ridge 5.8-   Matthes Crest Traverse - South to North 5.7   Southeast Face 5.10c   Joy 5.6   Playin' Hooky 5.8   Dream of Wild Turkeys 5.10a   Sour Mash 5.10a   Kor-Ingalls Route 5.9+   Unimpeachable Groping 5.10b   Crimson Chrysalis 5.8+

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# Methods

- **Target:** Maximum grade next month
- **Features:** Three lags and demographic information
- **Models:**
  - Linear Regression
  - Random Forest Regressor
  - Neural Network



# Methods

- **Target:** Maximum grade next month
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# Results

RMSE

2.4

$R^2$

.52





# Results

Final model:

RMSE  
**2.4**

$R^2$   
**.52**

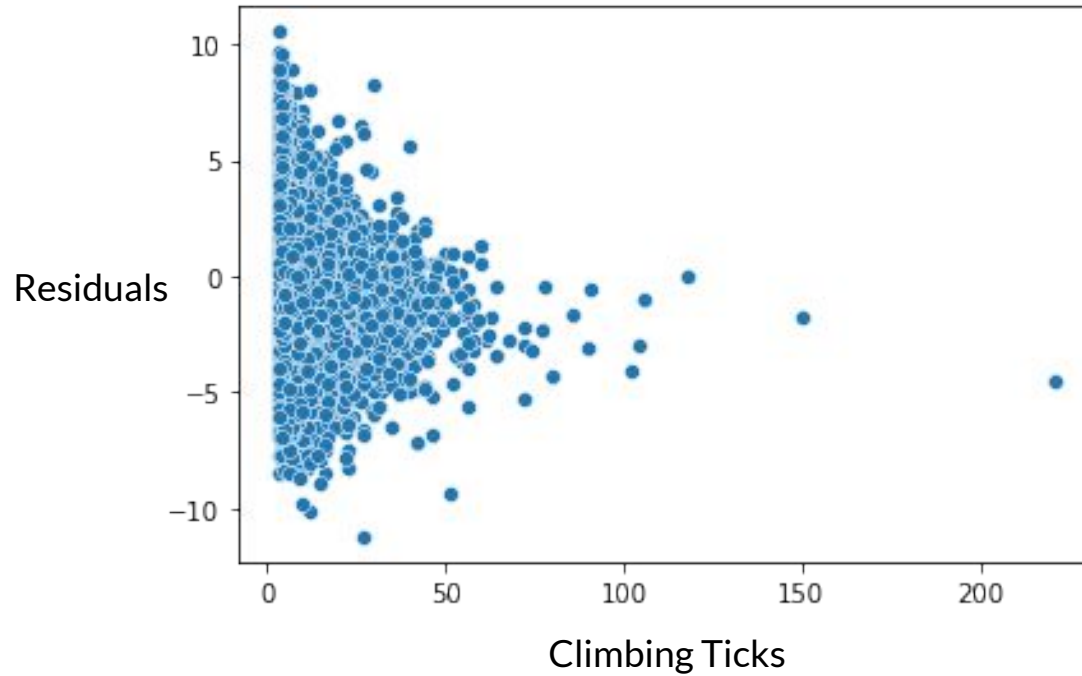
Picking a grade  
at random:

RMSE  
**10.5**

$R^2$   
**.001**



# Results



# Voila

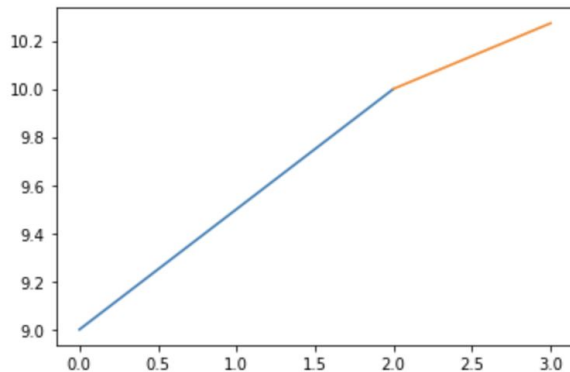
## Predicting Rock Climbing Performance

Input the maximum difficulty you climbed this month, last month, and two months ago to get a prediction for what you'll be climbing next month.

This Month

Last Month

Two Months Ago



Predicted grade next month: **10.272662345104283**





# Exploring Claimed Climbing Grades

What does it mean when someone says that they climb a particular grade?

“I’m a 5.11a climber.”

“I lead 5.9.”



# Exploring Claimed Climbing Grades

## My Process

User: "I lead 5.10a."

Calculate how many 5.10as and above this user has lead climbed.



# Results

Average Count

6.3





# Results

Average Count

6.3

Male  
Average Count

5.9

Female  
Average Count

7.7



# Conclusions and Applicability

- Web Scraping
  - Finding potential customers
  - Social media
- Regression Models
  - Forecasting product demand
  - Predicting customer behaviors



Thank you!



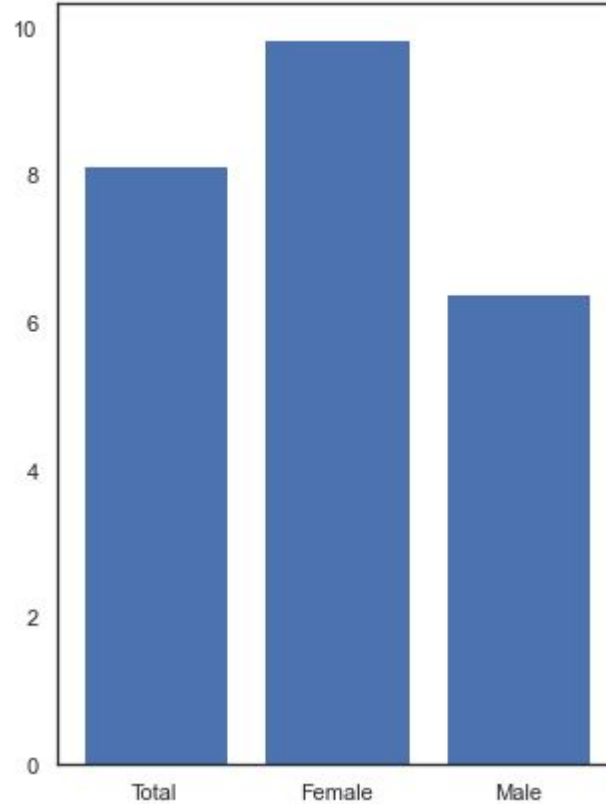
# Next Steps

- Add more layers to Neural Network
- Defining what people climb: Age differences





# Appendix



# Results



# Results

