2023 Learning Analytics Hackathon

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- JAPN 100 (1H) Lesson 1_D1.pdf
- JAPN 100 (1H) Lesson 1_D2.pdf
- JAPN 100 (1H) Lesson 1_D3.pdf
- JAPN 100 (1H) Lesson 1_D4.pdf
- JAPN 100 (1H) Lesson 1_D5.pdf
- JAPN 100 (1H) Lesson 1_D6.pdf
- JAPN 100 (1H) Lesson 2_D1.pdf
- JAPN 100 (1H) Lesson 2_D2.pdf
- JAPN 100 (1H) Lesson 2_D3.pdf

Midterm 1 (includes terms for which there wa

- 2005W1: blank and answers
- 2006W2: blank and answers
- 2009W2: blank and ans
- 2011S: blank and an
- 2011W2: blank and ar
- 2013W1: blank
- 2021W1: blank
- 2022W1: Sectior
- 2022W1: Sectio
- 2023W1: blank

Midterm 2

- 2007W1: blank a
- 2007W2: blank and
- 2009W2: blank and a
- 2011S: blank and answers
- 2011W2: blank and answers
- 2013W1: blank and answers
- 2018W2: blank and answers
- 2019W2:
  - Version A: blank and answers
  - Version B: blank and answers
- 2021W1: blank and answers (sample tuples for SQL questions)

Reading Resources

- Data-store--bigtable-osdi06.pdf
- Data-store-Cassandra.pdf
- Data-store-dynamo.pdf
- ...fs.pdf
- ...\Computer.pdf
- ...lake_SIGMOD.pdf
- ...QL.pdf
- graphx.pdf

	READINGS IN 4TH EDITION
...r equations	1.1-2.1
...ces	2.2-2.3
...inverses	2.4-2.5
...tion	2.6
...utations	2.7
...bspaces	3.1
...g Ax = 0	3.2
...and Ax = b	3.3-3.4
...form	3.3-3.4
	3.5
...subspaces	3.6
...) 3.4	
	8.2

Thought Prompts

Do you use all the resources given to you in a course?

Are there certain resource types (like summaries or images) that you learn better with?

Do your professors make good, quality material on these types?

What if Professors have an easier way to visualize resource type performance?

They can see which files are most helpful to students

They can provide alternative resources more effective for student learning

They acquire tools to improve their teaching and course material each term

What did we do with our data?

- Student —clicked on—> page / img / pdf —correlates?—> assignment grade (grouped by module)
- So first, we needed to figure out how to measure how well the students understand the module's material
- We did this by getting their score based on the corresponding assignment for a given module
- Then we find all the resources (like canvas pages, pdf, images) that they clicked on

Task 1: Joining Tables

- Calculate grade means for each student
- Create multiple tables to reflect students' engagement based on click frequencies on different pages of a module or attachment files (image and pdf)

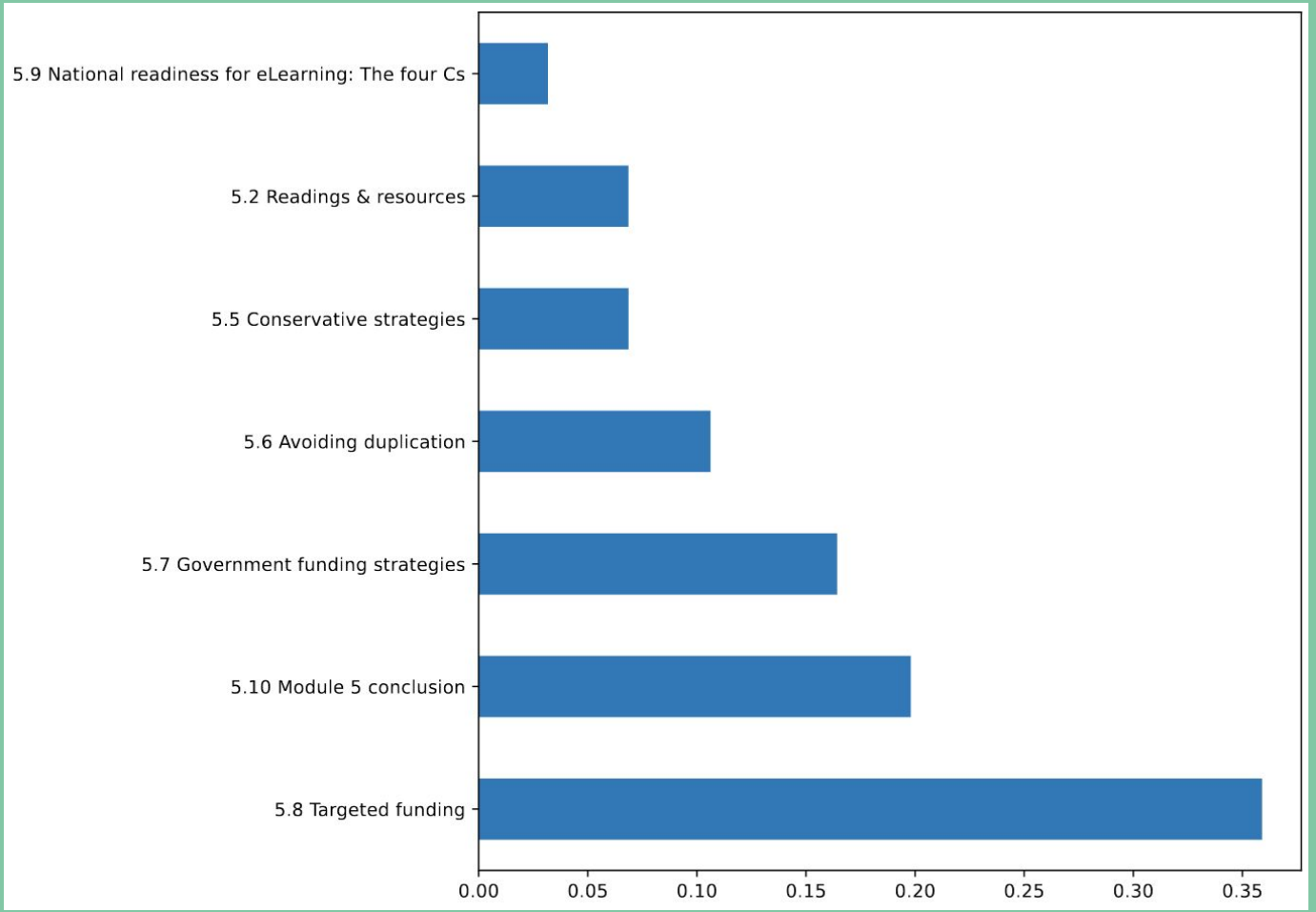
ation & engagement Current Score	Assignment Average	Total Average
90	83.66667	85.25
80	82.00000	81.50
80	87.00000	85.25
60	91.00000	83.25
60	81.33333	76.00
100	78.66667	84.00
40	73.00000	64.75
55	73.33333	68.75
90	84.66667	86.00

image024.png	image004.png	image026.png	image022.png
3	NA	4	4
2	4	4	3
7	7	10	6
1	13	3	1
5	3	20	3
2	4	4	1
1	1	1	1
8	NA	9	7
1	1	6	1

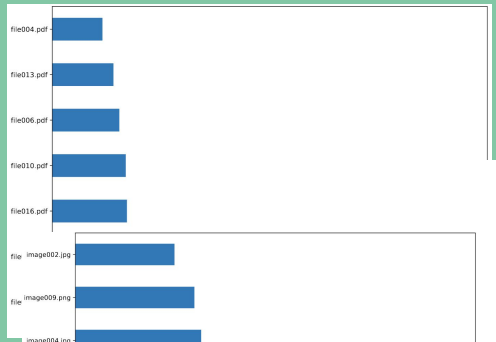
Task 2: Fitting Models

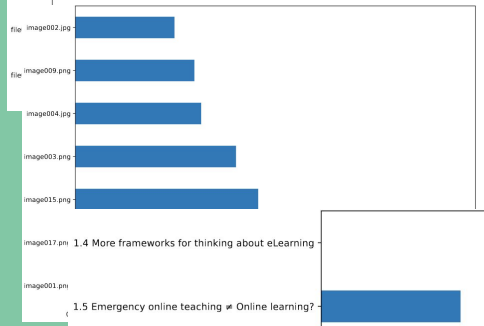
- Tested 3 different model types for which resource was clicked the most by successful students
- Multiple linear regression, Random forest regression, Multilayer Perceptron (Neural Network) with PCA to lower dimensionality
- Most accurate model: Neural Network

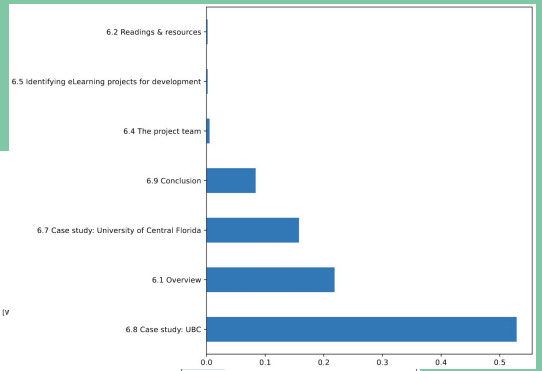
Random Forest Regression Model Example

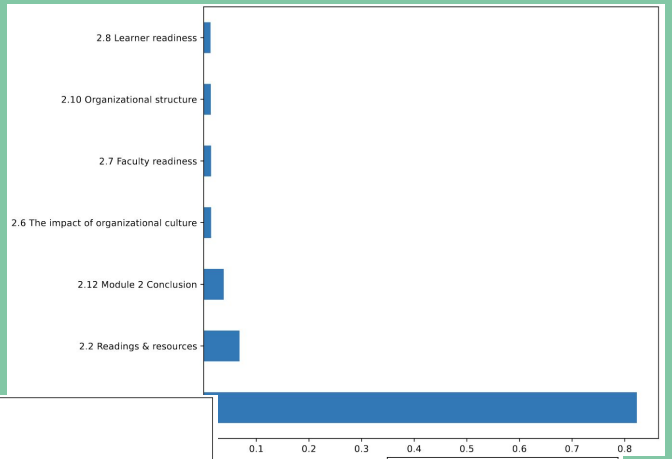


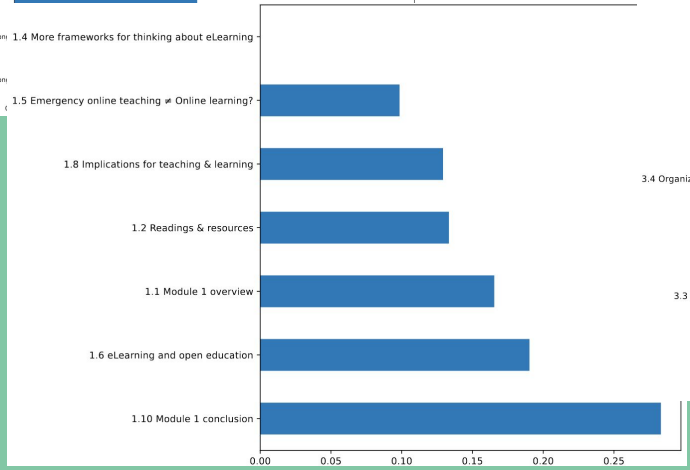
Random Forest Regression Model (Other Modules)

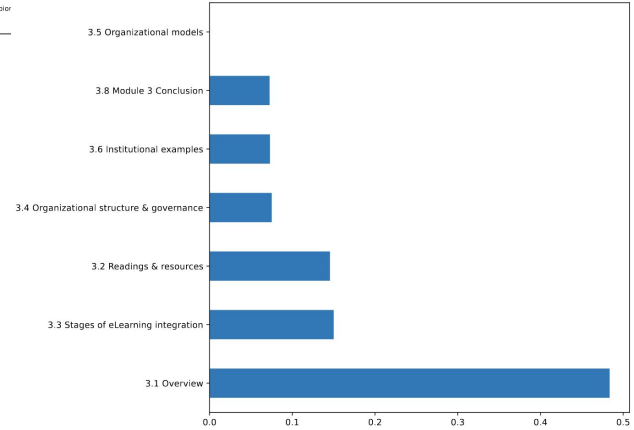


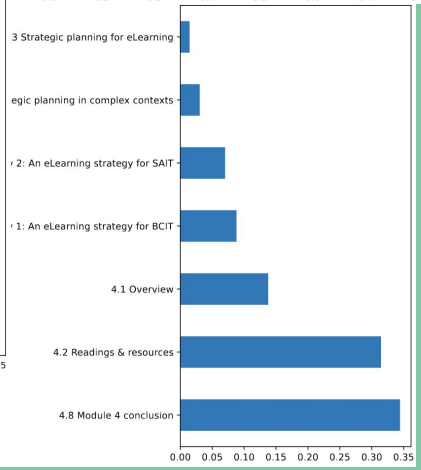




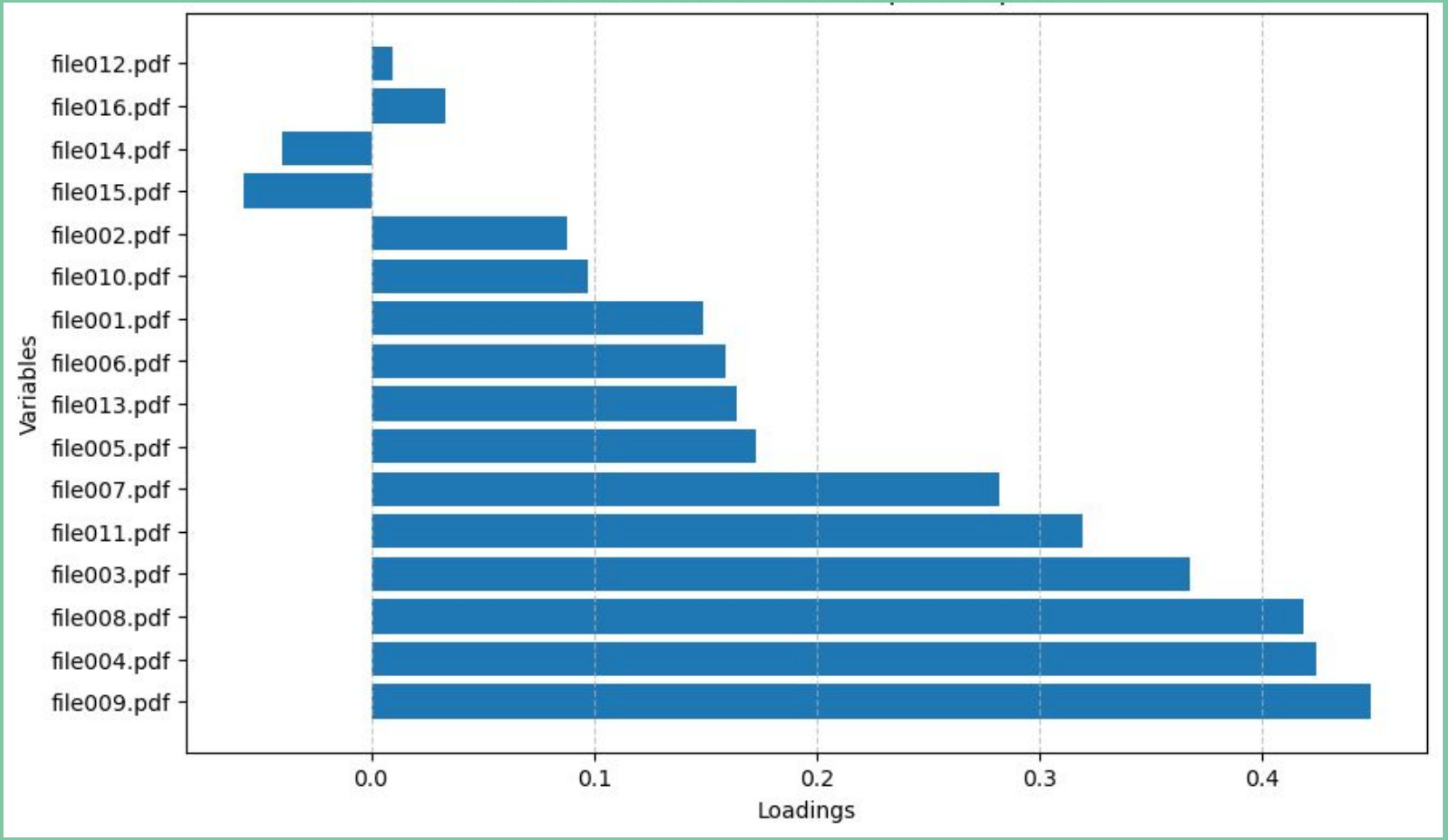




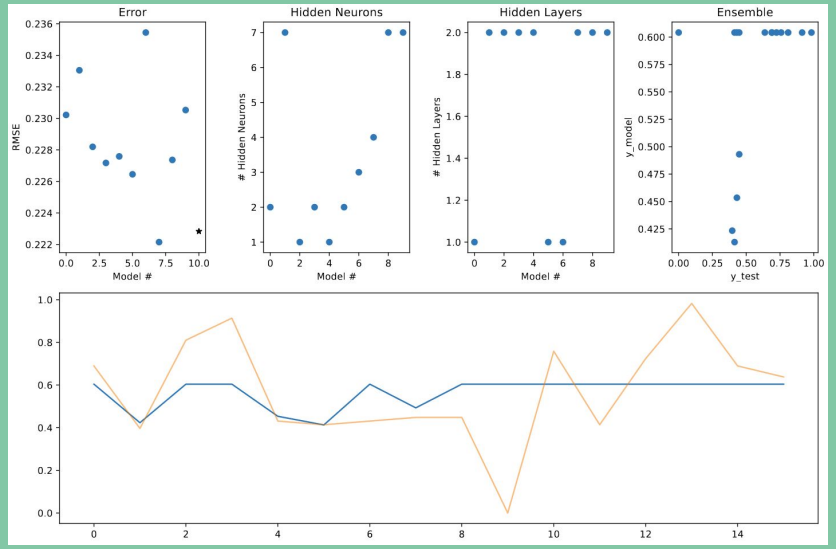


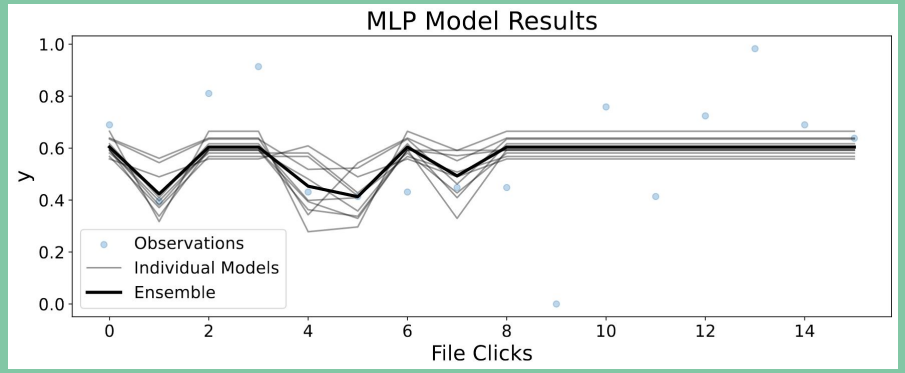


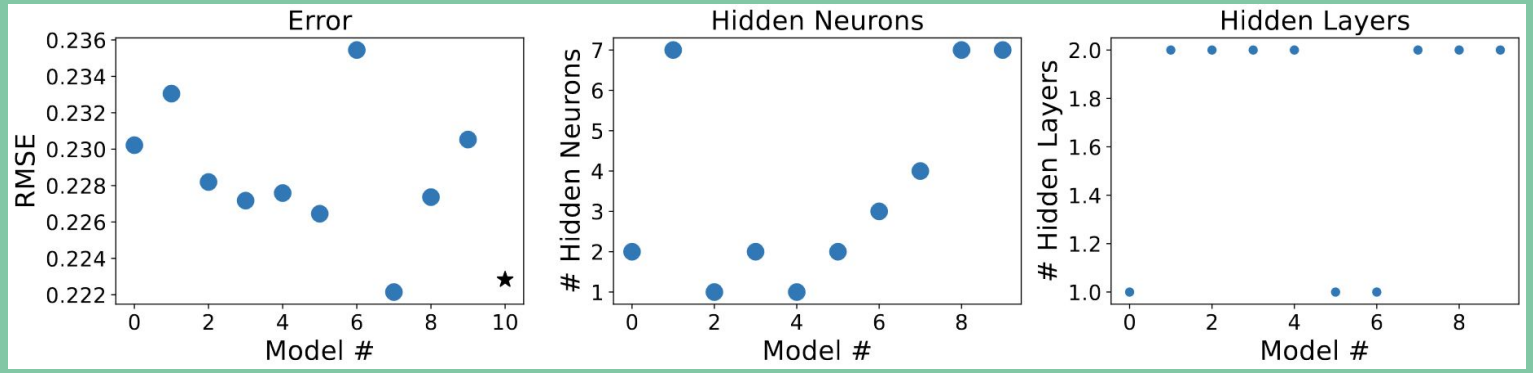
Multi Linear Perceptron Model



Principal Component Analysis and Neural Network Model







Curious about the models?

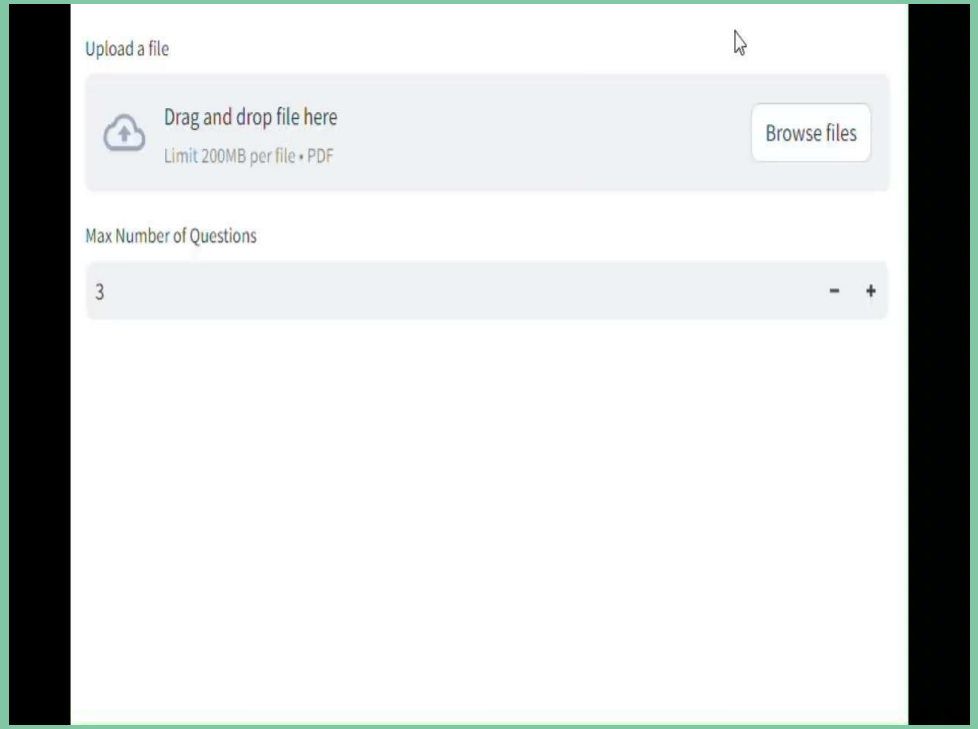
Feel free to look at our github page!

We know the most influential resource ...Now what?

- Example
  - Let's say formative assessments are how you learn best.
  - What if we give instructors a tool to make it easier to create different types of resources based on one?

Demo: PDF to Multiple Choice questions

Tech stack: Python, OpenAI API, Streamlit



Next Steps

- Optimizing the model using more data
- Providing more visualizations for resource type performance to instructors
- Deploying conversion of resource types for image, pdf, formative assessment, and Canvas page

THANK YOU