Project Thor

Team Members:

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Faculty Advisor:

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Client:

Name	Email
Amitabh Nag - Aerospace, Physics and Space Sciences	anag@fit.edu

Current Progress of Milestone 2

Task	Progress	Adonay	Jared	Josh	Luke
1. Update "Hello World" demos to better reflect the projects current status	100%	Automated Data Entry demo	Entropy v2 Findings demo	n/a	Website demo
2. Update project documentation to reflect any new changes.	100%	Read and reviewed edits	Read and reviewed edits	100% Updated Design Documentation	Read and reviewed edits
3. Work on getting a school supplied raspberry pi and set up the local server on that	100%	50% Helped Obtain	None	50% Obtained from Student Design Center	None
4. Implement an automation script that transfers the data from the ASCII file.	100%	50% Offer help / troubleshoot	50% Create and implement	none	none
5. Complete at least 25% of the web application in terms of design layout. Content will come later	100%	Reviewed and offered design suggestions.	Reviewed and offered design suggestions.	Created page layouts, 75% of team page content, and Navigation bar functionality.	Added 25% functionality to generate key button
6. Show current entropy findings of the data and have an idea of how it will be measured and presented on the web application	100%	Offer help / troubleshoot	100% Created second revision to control clusters/grouping	Offer help / troubleshoot	Offer help / troubleshoot

7. Have a script in place that at the very least takes data from the lightning table of the database, performs a calculation, and inserts the result into the key table (implement md5 algorithm)	100%	Work on 50%	Work on 50%	Offer help / troubleshoot	Offer help / troubleshoot

5. Discussion - Accomplishments

1. Task 1: Updated Demos

   We again have three demos prepared for this milestone: the web application, the automated data transfer, and the current data entropy. For the web application, we now have a live application that we hope to pull up on the web browser and show to the class. Specifically, we want to show that we have the page layouts done similar to our wireframes, we have context on the team page with email links and tooltips, and we have link, active link, and hover link responses in our navigation bar. Also, we have also developed some bugs during certain use cases with the above mentioned that we'll demonstrate and be troubleshooting in the future.

2. Task 2: Update Project Documentation

   For this milestone, we have not made many changes to our project's documentation with just one exception. In the Design doc we have updated our systems architecture diagram to reflect our decision to primarily use html over php for our web application and to use webhooks to transfer our repo files from the online repo to the pi's internal storage so the web server always has the most up to data files for the web application.

3. Task 3: Get raspberry Pi from School

   We obtained a Raspberry Pi 4 model B from the Student Design Center and transferred our project off my Josh's personal device and onto this one. It is currently online and hosting the web application and database.

4. Task 4: Automation Script

getDatabase.py

This script returns all rows of every table in a database. Once the database is populated with pruned data, it can be retrieved to generate keys.

5. Task 5: Web Application Layout

The web application has been fully laid out with what we believe will be close to our final design. Additionally, we went beyond and added context was added to the team page (approx 75% done) and the About page (approx. 25%). Also, we have added active and hover functionality to the navigation bar so that it's more simplistic for the user to see what page they are on. Finally, we have made

6. Task 6: Entropy Findings

The automated numbers generator for this milestone is new and improved. While utilizing the same fields of information, those fields have since been 'zoomed in' upon to give increasingly high variance levels. For example, our random number generator is now utilizing a more zoomed in version of latitude that brings its level of variance from 6.77 to 29,183.63. From here, a function has been built but not yet fully utilized to generate hashes of the number generated.

7. Task 7: MD5 Alg.

MD5hash.py
This script reads from STDIN and writes to STDOUT an MD5 hash. This will be used in conjunction with getDatabase.py to select all keys from the database, then pipe the output into MD5hash.py to generate hashes for all keys. This script will eventually be called via PHP to display the MD5hash on the website. The MD5hash.py script will save a single hash in a temporary file at a time, for each key, overwriting the temporary file every time.

6. Discussion - Contributions

1. Luke Bonenberger:

Worked on the implementation of the backend PHP connected. This included some design of the generated key page of the website and research to learn how PHP works. Integrated 'Generate Key' button to retrieve, display, and format data from the database and server scripts. For example, when clicking the 'Generate Key' button, data appears on the website in a user-friendly format including a visual representation of the key in the form of a location pin in google maps.

2. Jared Blanco:

Worked primarily on two automation tasks, the first being the automated insertion of taking an ascii file full of the necessary lightning data, breaking down the data into the fields we intend to utilize, then connecting to the database and uploading those fields. Once that task was completed, I have been putting all efforts into generating a new random number

from those fields with higher variance as well as reducing the clumps in our utilized data. For example, our random number generator is now utilizing a more zoomed in version of latitude that brings its level of variance from 6.77 to 29,183.63.

    3. Josh Temel:

This month I worked with the Student Design Center to obtain a school's raspberry pi. I then transferred our project off of our personal one onto the school's. Additionally, I worked on the design for our web application. I layed out all of the pages following the wireframes in the design doc, began filling in the content for the team page, and added link, active link, and hover link functionalities to the navigation bar for all of the pages. Finally, I created a webhook so that the pi receives an updated copy of our online repo everytime there is a push so that the web application is always up to date. (Also worked on presentation, documentation, and demos with the rest of the group)

    4. Adonay Pichardo:
        Backend and tools support:

getDatabase.py
        This script returns all rows of every table in a database. Once the database is populated with pruned data, it can be retrieved to generate keys.

MD5hash.py
        This script reads from STDIN and writes to STDOUT an MD5 hash.

CreateDatabase.py
        This script can recreate the entire Thor database. With the ASCII file parsed into a CSV file, with a file containing the credentials required for the mySQL server, the entire Thor database can be regenerated on any machine supporting mySQL database servers and Python3. This makes the project portable and recreatable.

7. Milestone 3 Plan

Task	Adonay	Jared	Josh	Luke
1. Update demos	25%	25%	25%	25%
2. Update Documentation	Read & Review	Read & Review	100%	Read & Review
3. Add Content to the Web App (About, Generate Key, Learn more)	Read & Review	Read & Review	75%	25%
4. Full functionality to Generate Key	50%	Offer help / troubleshoot	Offer help / troubleshoot	50%

button (Strike info, md5)				
5. Fix Webhook bug	Offer help / troubleshoot	Offer help / troubleshoot	100%	Offer help / troubleshoot
6. Create website domain name	Offer help / troubleshoot	Offer help / troubleshoot	Offer help / troubleshoot	100%
7. Create LinkedIn Profiles and link to Web App Team page	25%	25%	25%	25%
8. Automation that stores all generated numbers in database	50%	50%	Offer help / troubleshoot	Offer help / troubleshoot
9. Create documentation explaining the generation of key	Offer help / troubleshoot	50%	50%	Offer help / troubleshoot
10. Generate key from database, insert key into database, MD5 hash, display MD5 hash on website	50%	Offer help / troubleshoot	Offer help / troubleshoot	50%

8. Discussion & Lessons Learned

Task 1: Updating Demos
        Recordings are needed as backup for when the live demonstration does not work as expected.

Task 2: Updating Documentation
        n/a

Task 3: Getting New Pi
        n/a

Task 4: Implement Transfer of Data from ASCII to Database

The transfer of data from ASCII to the database was performed using Python. The data from the ASCII file was formatted and we extracted the data which is proven to have higher variation. The python script takes the ASCII file, and uploads all of the cleaned data directly into the database. This implementation will be easily adaptable to process a real time data stream as a future capability.

Task 5: Complete 25% of Web Application Design

Learned how to modify css and add/delete rules regarding what css will be used for certain media. Additionally, I learned how to use css to change the color of a nav link for both the hover and active actions. Finally, I learned how to get the nav links to navigate to different pages as well as display different info in the browser tab for each page.

Task 6: Current Entropy Findings

In the process of demonstrating entropy within the data set, I learned that by utilizing already existing strategies demonstrated in other algorithms, we can amplify the entropy of our current data set. For example, with the longitude and latitude, 'zooming in' on those current locations in order to generate a higher level of entropy within those sets. Another primary lesson learned is that even natural phenomena have trends, such as lightning trends that bring them closer to the equator. This problem was mitigated by truncating the front of the data fields in order to prevent any trends being further demonstrated.

Task 7: MD5 Implementation

Coordination among the database, the python script, and the website. There needed to be an agreement of how to pass data along to the next process of pressing the generate key button. We agreed the database would be used to retrieve and save all data used by each step. This allows and central reference point AND prevents redundant data being generated, even temporarily, on the server's file system.

9. Date(s) of Meeting(s) with Client:

Date	Topic
n/a	● n/a

10. Client feedback of current milestone

1. Dr. Nag advised us to develop documentation that explains the processes we are using to generate our random numbers. In other words, offer a detailed explanation

along with citations of any outsider resources we have used to make decisions regarding

11. Dates of Meeting with Faculty Advisor

Date	Topic
October 29, 2021	Presented Milestone 2 and gathered feedback

12. Faculty Advisor Feedback for Milestone 2

1. Dr. Sid provided feedback regarding our calculation and data exclusion methods. We need to indicate how our process works and what research validates our progress. This includes the algorithms, equation names, and steps taken to generate the keys and how redundant data is excluded. We also need to properly cite all of the algorithms, equations, and googled articles in our project presentation.

Present the names of algorithms
Present text on the website explaining Jared's process

13. Approval from Faculty Advisor

"I have discussed with the team and approve this project plan. I will evaluate the progress and assign a grade for each of the three milestones."

Signature: _____ Date: _____11/01/2021_____

1. Evaluation by Faculty Advisor
    - Faculty Advisor: detach and return this page to Dr. Chan (HC 214) or email the scores to pkc@cs.fit.edu
    - Score (0-10) for each member: circle a score (or circle two adjacent scores for .25 or write down a real number between 0 and 10)

Adonay	0	1	2	3	4	5	5.5	6	6.5	7	7.5	8	8.5	9	9.5	10
Jared	0	1	2	3	4	5	5.5	6	6.5	7	7.5	8	8.5	9	9.5	10
Josh	0	1	2	3	4	5	5.5	6	6.5	7	7.5	8	8.5	9	9.5	10
Luke	0	1	2	3	4	5	5.5	6	6.5	7	7.5	8	8.5	9	9.5	10

Facutly Advisor Signature: _____ Date: _____