Project Thor

Team Members:

Name	**Email**
Adonay Pichardo	apichardo2019@my.fit.edu
Jared Blanco	jblanco2018@my.fit.eud
Josh Temel	jtemel2018@my.fit.edu
Luke Bonenberger	lbonenberger2018@my.fit.edu

Faculty Advisor:

Name	**Email**
Sid Bhattacharyya	sbhattacharyya@fit.edu

Client:

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

Current Progress of Milestone 3

Task	Progress	Adonay	Jared	Josh	Luke
1. Update demos	100%	25%	25%	25%	25%
2. Update Documentation	100%	Read & Review	Read & Review	100%	Read & Review
3. Add Content to the Web App (About, Generate Key, Learn more)	0%	Read & Review	Read & Review	0%	0%
4. Full functionality to Generate Key button (Strike info, md5)	100%	50%	Offer help / troubleshoot	Offer help / troubleshoot	50%
5. Fix Webhook bug	50%	Offer help / troubleshoot	Offer help / troubleshoot	50%	Offer help / troubleshoot
6. Create website domain name	100%	Offer help / troubleshoot	Offer help / troubleshoot	Offer help / troubleshoot	100%
7. Create LinkedIn Profiles and link to Web App Team page	100%	25%	25%	25%	25%
8. Automation that stores all generated numbers in database	100%	50%	50%	Offer help / troubleshoot	Offer help / troubleshoot
9. Create documentation	0%	Offer help / troubleshoot	0%	0%	Offer help / troubleshoot

explaining the generation of key					
10. Generate key from database, insert key into database, MD5 hash, display MD5 hash on website	100%	50%	Offer help / troubleshoot	Offer help / troubleshoot	50%

5. Discussion - Accomplishments

1. Update Demos:
    a. The demos have been updated to reflect our most recent results as of the writing of this document. Most have not changed in appearance as the changes made have been on the backend. With that said, we have dramatically changed the way we are presenting our test results by showing graphs of the distribution of the random numbers by using both a distribution curve and histogram graphs.
2. Update Documentation:
    a. No changes in documentation.
3. Add Content:
    a. The generate key page has updated dynamic content. This content includes additional attributes of lighting that correlate to the key generated.
4. Full functionality:
    a. The integrated functionality between the website, database, and scripts has been fully implemented. Specifically, the ‘Generate Key’ button calls a script to be executed and a real key is outputted to the website.
5. Fix webhook:
    a. The purpose of the webhook is to enable our web server to automatically update its local files when changes are made to the cloud github repository. This issue remains unresolved at this time.
6. Create website domain:
    a. Luke acquired a free domain name for our website, projectthor.tk.
7. Create LinkedIn and github profiles:
    a. All members with LinkedIn and github profiles will be advertised on our website for contact information.
8. Automate storing generated numbers:
    a. Adonay created a python backend script to automate the process of storing generated keys into the database.
9. Documentation on key generation:

    a. This documentation has yet to be written as the team has backtracked and moved onto a new approach. Therefore, we have delayed it until the next milestone.
10. Generate key, save key, create hash, display hash:
    a. Adonay created a python backend script, that when called by the website, pulls data from the database, uses such data to generate a key (dummy algorithm, Jared can provide his own once finished), saves the generated key, uses the generated key to create an MD5 hash, and saves the MD5 hash and key as a pair in the database. Currently only ONE can be generated, then the entries in the database must be deleted before running the script again.

6. Discussion - Contributions

Luke Bonenberger:

Added content and features to Generate Key page to display more features with more interactivity than before. This includes displaying more information about each lightning strike when a new key is generated. Additionally, the webserver was connected to a Python script which executes with lightning data as input, and a key as output.

Jared Blanco:

Developed and implemented a new method of displaying the distribution of numbers for comparison, added new testing methods for number distribution utilizing entropy, implemented random number generator that is seeded by number generated by lightning data.

Josh Temel:

Found and installed Dieharder Test Suite for randomness testing. Working with Jared to run tests and the data set to get a baseline of where we are at. Also, researching the tests to help better understand their meaning and how we can change our method of combining the data fields to improve the results.

Adonay Pichardo:

Created 2 backend tools for storing generated keys in the database, and another for generating a key from data, saving that key, using the key for a hash, saving that hash and key.

7. Milestone 4 Plan

Task	Adonay	Jared	Josh	Luke
Update Demos				
Update documentation				
Create and add detailed explanation page to the problem section of the web app				
Create draft of solution explanation for the solution section of the web app				
Find and implement better ways of combining the data fields				
Begin outlining a more detailed test plan / system for testing the functionality of the web application so that we can test ourselves and allow the class to find and report bugs.				

8. Discussion & Lessons Learned

Update Demos: n/a

Update Documentation: n/a

Add Content:
This has been delayed until the next milestone as our approach to measuring randomness has changed and is still being learned by members of the team.

Full functionality:

Fix webhook:
We have yet to resolve this issue. Suspect problem lies in the TCP port protocols and not in the commands being used to try to bind the listening service to just one port.

Create website domain:
We learned that there are free web domains available, but that they're response time is fairly slow. For now this will work, but in the future we may want to find a faster domain.

Create LinkedIn and github profiles:
This was relatively straightforward to do. However, it has made us want to research methods of somehow linking the link settings together so that we don't have to change all of the formatting four times over, but instead just do it once and have the other links update automatically.

Automate storing generated numbers:

Documentation on key generation:
While researching key generation while utilizing multiple fields used in conjunction is a less developed field. As there are multiple other universities that have researched utilizing phenomenons as random number generators, they are not directly using multiple fields in order to generate a unique key.

Generate key, save key, create hash, display hash:
The generation of keys and MD5 hashes has raised questions like, "Do we delete Lightning Data once used, or do we continue to store the data, though it should not be reused for generating a key?" We must decide for both the maintenance of the database, and to avoid redundant and needless data.

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

Date	Topic
N/a	● n/a

10. Client feedback of current milestone

1. No meeting with client.

11. Dates of Meeting with Faculty Advisor

Date	Topic
November 22, 2021	● Feedback for Milestone2

12. Faculty Advisor Feedback for Milestone 2

1. Dr. Sid indicated that we should include generating a report of collisions for the keys we created before using the MD5 encryption algorithm.

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: _____

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

Faculty Advisor Signature: _____ Date: _____