LTTS DAILY REPORT

WI-HEADPHONES

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1. Product definition [1]

- Headphones are a pair of small loudspeaker drivers worn on or around the head over a user's ears. They are electroacoustic transducers, which convert an electrical signal to a corresponding sound.
- Headphones let a single user listen to an audio source privately, in contrast to a loudspeaker, which emits sound into the open air for anyone nearby to hear. Headphones are also known as ear speakers, earphones, or cans.

2. Aging of Headphones [2]

In the Beginning:

- 1881 – Way before MP3s, dubstep, and premium Spotify accounts, headphones had little to do with music at all. Back in the 1880s, the first headphones (or at least their early ancestors) were used by telephone operators. It was a single earpiece that rested on the user's shoulder and weighed over 10 pounds.

- 1895 – Thanks to the Electrophone system, in 1895 folks could start rocking out to the sick beats of the local opera house from the comfort of their own home. Subscribers to the pricey service would listen through headphones that looked more like stethoscopes than a modern offering as very large people produced very big sound on a stage miles away.
- 1910 – Nathaniel Baldwin began manufacturing the first modern headphones. He crafted them in his kitchen and sold them all to the U.S. Navy. This was the first time a pair of cans resembled something you'd see today.
- In the Beginning the sound quality of Headphones are not that great.

Mid:

- Slowly the Headphone Sectors started to grow further from the united states navy to the music industry and all other sectors of public life.

- In the mid many Headphones, manufacturer company comes into the market some of them are AKG, Philips, Samsung, Sony, Sennheiser, Skull candy, etc. so due to a lot of competition Headphones become cheap.
- In mid, there are a lot of features introduced to the headphones.

Some advance features are:

- Noise cancelling

Active noise-cancelling headphones contain a microphone that measures the noise around you and then creates an opposite sound wave to eliminate that noise. You just hear your music, podcast or audiobook. Not all noise cancellation is the same though. For a premium listening experience, some models utilize proprietary technology that continually adapts the level of noise cancellation to whatever you're doing.

- Water-resistant and waterproof

Great for working out, these headphones are designed with water-resistant materials to keep out sweat and water. You'll be able to keep working out at the gym or walking in the rain without having to stop and wipe off your headphones.

One standardized way products certify their claims of water-resistant or waterproof is the IP rating. The last number in an IP rating refers to liquid protection. It ranges from 0–9, with 9 being the highest level of defense against water. (This system is also used to define protection from dust and other solids, so you could see two numbers in a rating.) Headphones labeled waterproof offer a better degree of water protection, typically indicated by a higher IP rating. See the product information for complete details

- Voice assistants

These headphones let you manage your music playback, check messages and get answers on the go using your voice. There are two types: headphones with built-in voice assistants such as Apple Siri, Google Assistant or Amazon Alexa, or headphones designed to work with these services. Because headphones that work with a voice assistant must connect to a smart device or application for voice control, the experience isn't seamless and capabilities are sometimes limited.

If you anticipate using voice commands frequently, headphones with a built-in voice assistant make it quick and easy with minimal setup and a dedicated button to activate.

- Biometric

Biometric headphones monitor your heart rate by gathering information directly from your ears while you listen to music, and some models even feed you audio cues to aid in your workout. Fitness enthusiasts are able to keep tabs on their heart rate without needing an additional device. Plus, many biometric headphones are compatible with popular fitness apps like Run Keeper

- Volume limiting

The ability to keep the volume at safe levels is an excellent feature to have when your child wants to use headphones. Volume-limiting headphones do exactly that: They are typically designed to keep volume at 85dB or less. Plus, not all volume-limiting headphones are designed for children, so they can be a good alternative for adults concerned with protecting their own hearing as well.

- Sound amplification

Distracted by background sounds when you try to have a conversation in a noisy environment? Try a pair of headphones with sound amplification and control the sound around you. Built-in directional microphones zero in on the conversation while taking the edge off background noises.

Modern market:

As we slowly improve ourselves in the modern market These are various things about Modern headphones.

- 4G and WIFI connections no need for external devices.
- 3d tracking Headphones locate the listener's ear know where to steer the audio.
- Translation mode Headphones Can Translates up to 11 different languages.

3. Cost of product [3]

- In the Beginning, only the United States Navy has access to Headphones so it is very costly.
- In the mid many Headphones, manufacturer company comes into the market some of them are AKG, Philips, Samsung, Sony, Sennheiser, Skull candy, etc. so due to a lot of competition Headphones become cheap.
- In 2020 generally, we get Normal Wired Headphones in under 1.5k and Wireless Headphones under 4k (basic features) but if we include features like active noise cancellation, Voice assistants, Water-resistant, etc. Price of Headphones become high like 10-15k.
- But in 2020 Headphones are not only used to listening to music but also for gaming and video/audio conferencing. So, we required low latency Headphones for gaming and high-quality mic Headphones for video/audio conferencing.

4. Problem Statement

To design and develop a wireless Headphone that uses WIFI Technology for connectivity, also featured with Active noise cancelation (ANC) and inbuilt Voice Assistant.

5. SWOT Analysis

Strength:

- It uses WIFI technology for low latency mode which helps in effective data transfer between connected and connecting devices.
- WIFI technology also provides high-resolution sound.
- We have active voice cancelation and an inbuilt voice assistant.

Weakness:

- The battery needs to be recharged once a while.
- WIFI consumes a lot of energy which drains the battery.

Opportunities:

- It can be adopted in an area where Bluetooth limits.
- ANC helps in avoiding external noise and therefore used in video/audio conferences.
- Inbuilt voice assistant helps in the various task.

Threats:

- The radio frequencies generated by WIFI lead to environmental hazards.

6. Requirements [6]

High-level requirements

ID	DESCRIPTION
HL_01	The system shall provide less latency with active noise cancellation (ACN).
HL_02	The system shall be connected to wirelessly to connecting devices using Wi-Fi
HL_03	The system shall have a Wi-Fi module connected to it, and be able to get connected to the connecting device using WIFI technology

Low-level requirements

ID	DESCRIPTION
LL_01_HL01	The system shall cancel external noise using ANC algorithm that is presently available
LL_02_HL02	The connecting device shall be Wi-Fi enabled with internet access.

LL_03_HL03	The system shall get connected to the connecting device through Bluetooth in case of Wi-Fi Failure

7. Design [4],[5]

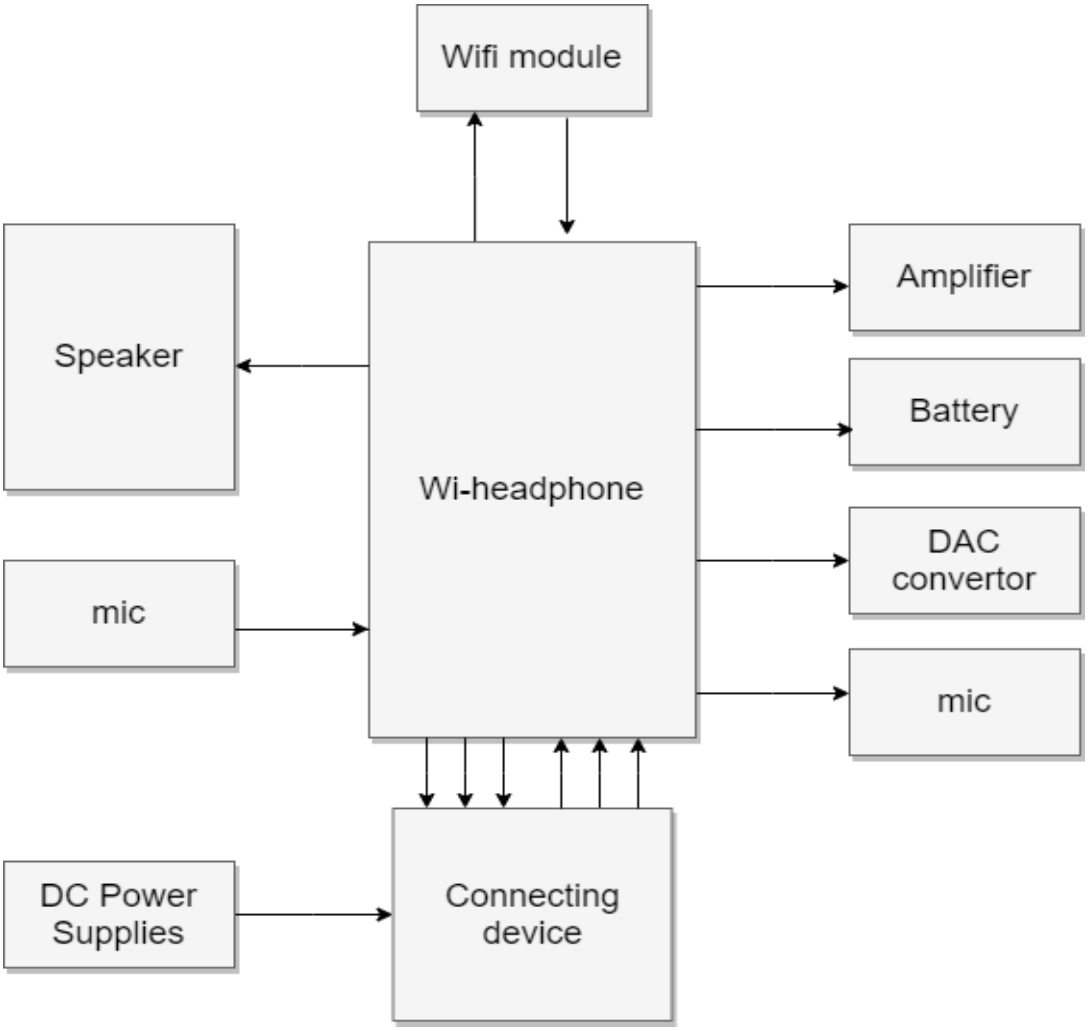


Figure 1: component diagram of proposed system

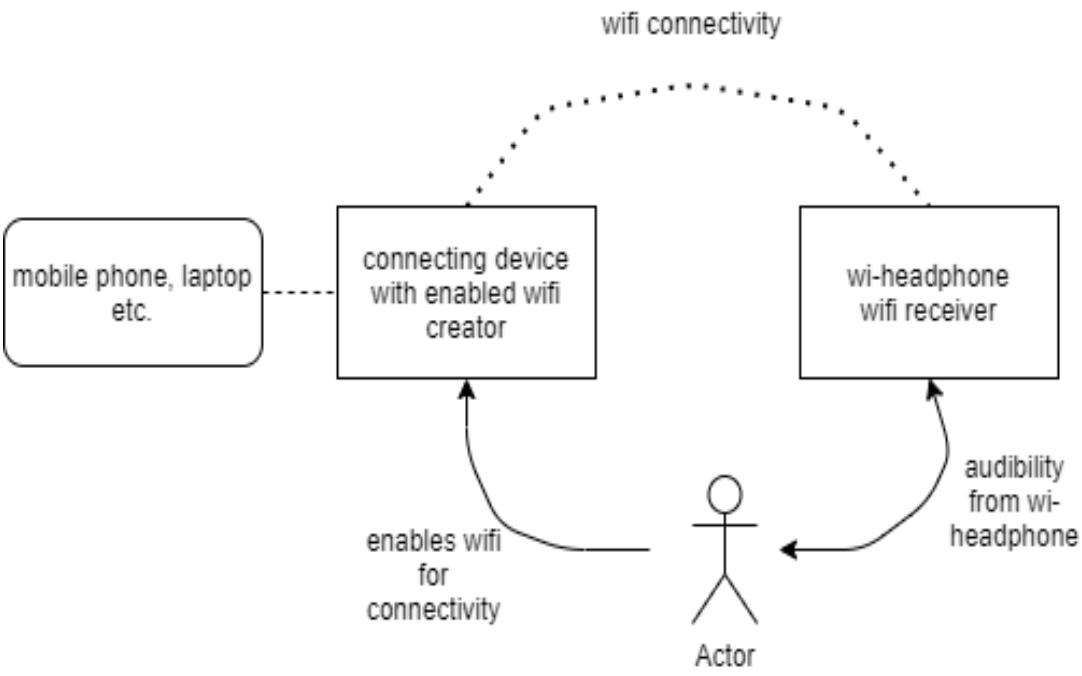


Figure 2: Deployment diagram of proposed system

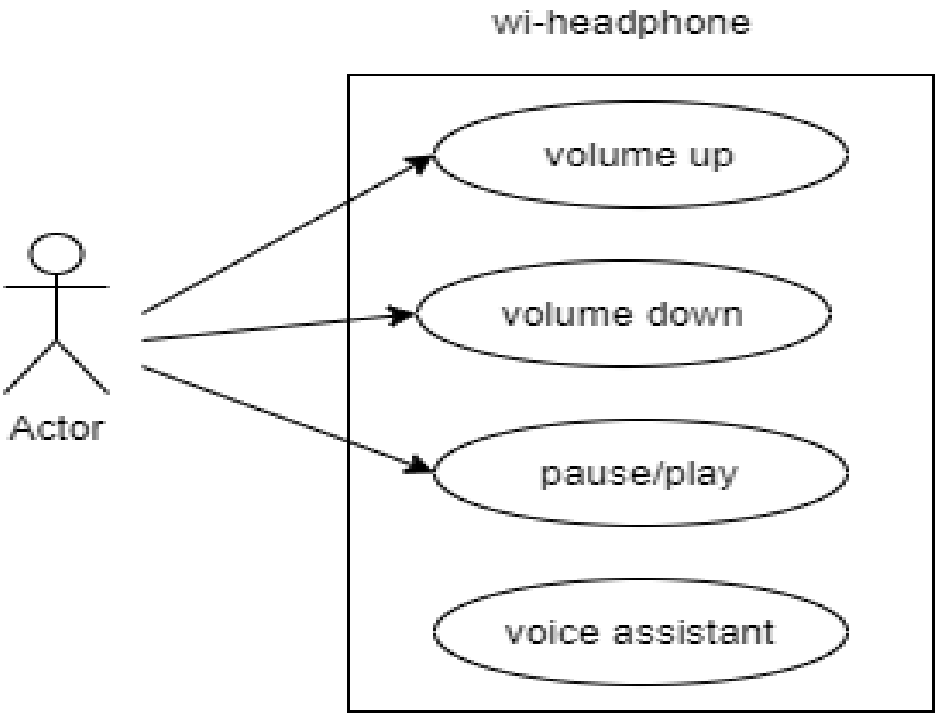


Figure 3: use case diagram of proposed system

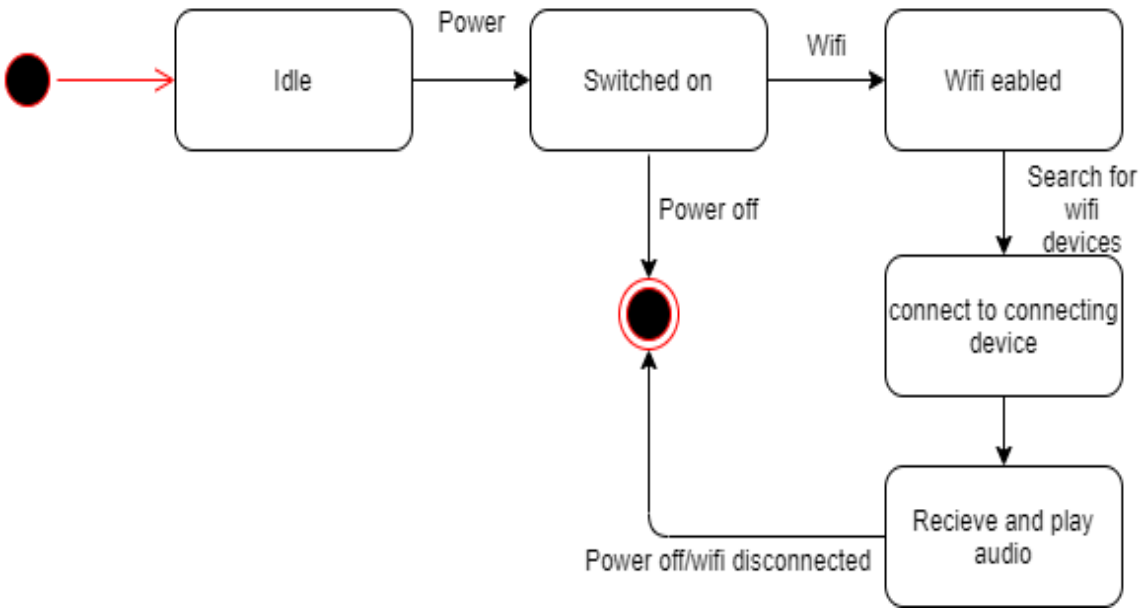


Figure 4: State diagram of proposed system

8. Test Plan [7]

High-level test plan

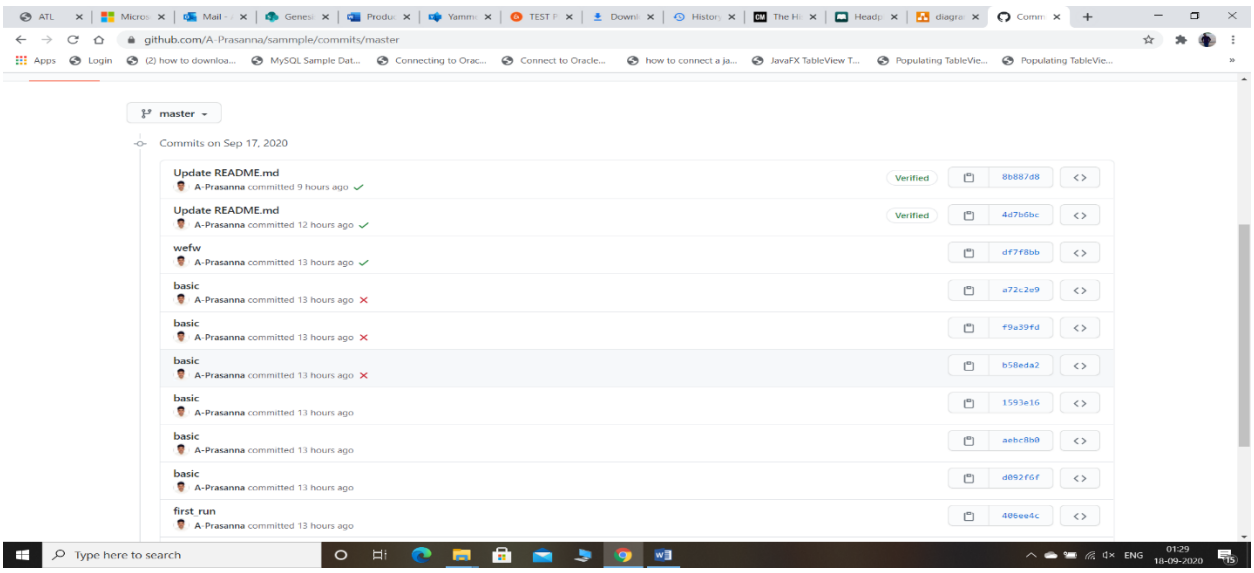
ID	DESCRIPTION	PRE-CONDITION	EXPECTED INPUT	EXPECTED OUTPUT	ACTUAL OUTPUT
HL_01	Active noise cancellation	Power supply	Different frequencies of noises	Required audio	
HL_02	Wi-Fi enabling	Wi-Fi should be turned on	Audio from connecting device	Audio to connected device	
HL_03	Voice assistant	Software should be enabled	User voice	Expected task to be completed	

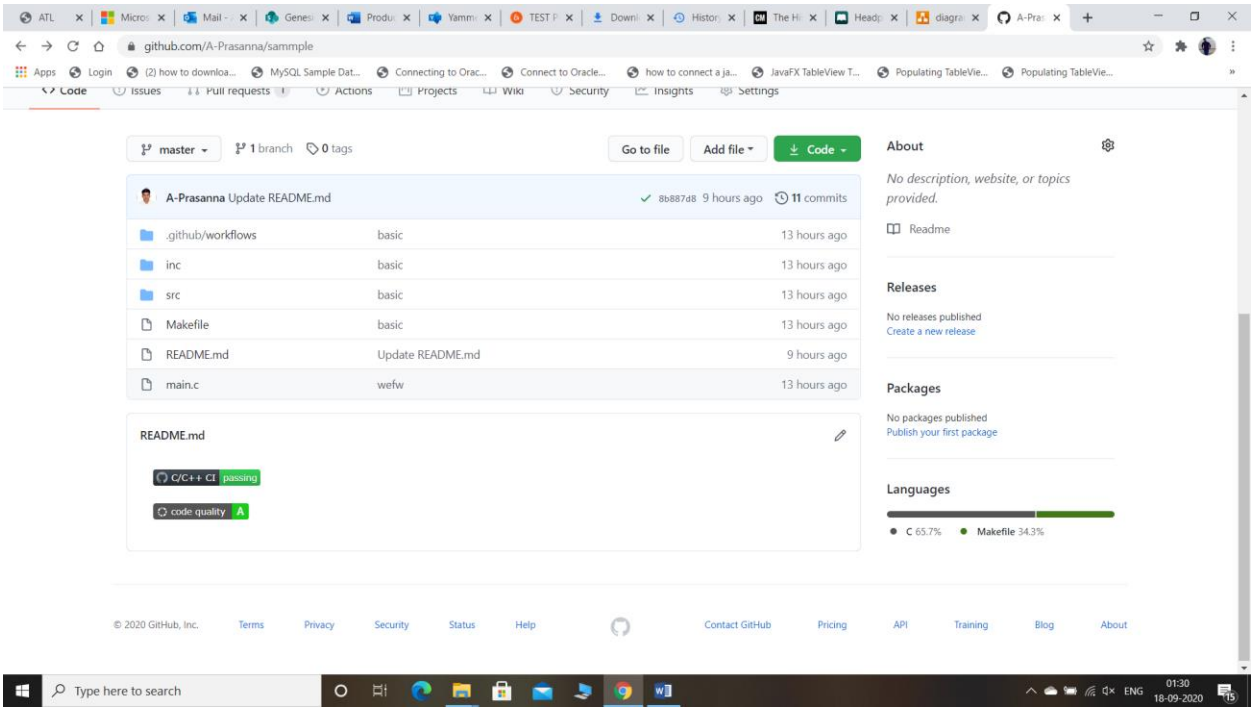
Low-level test plan

ID	DESCRIPTION	PRE-CONDITION	EXPECTED INPUT	EXPECTED OUTPUT	ACTUAL OUTPUT
LL_01_HL01	Active noise cancellation	ACN Algorithm should be installed	Different frequencies of noises	Required audio	
LL_02_HL02	Wi-Fi enabling	Wi-Fi should be installed on both devices.	Audio from connecting device	Audio to connected device	
LL_03_HL03	Bluetooth connectivity	Bluetooth should be installed and enabled	Bluetooth connectivity	Data transfer from Bluetooth	

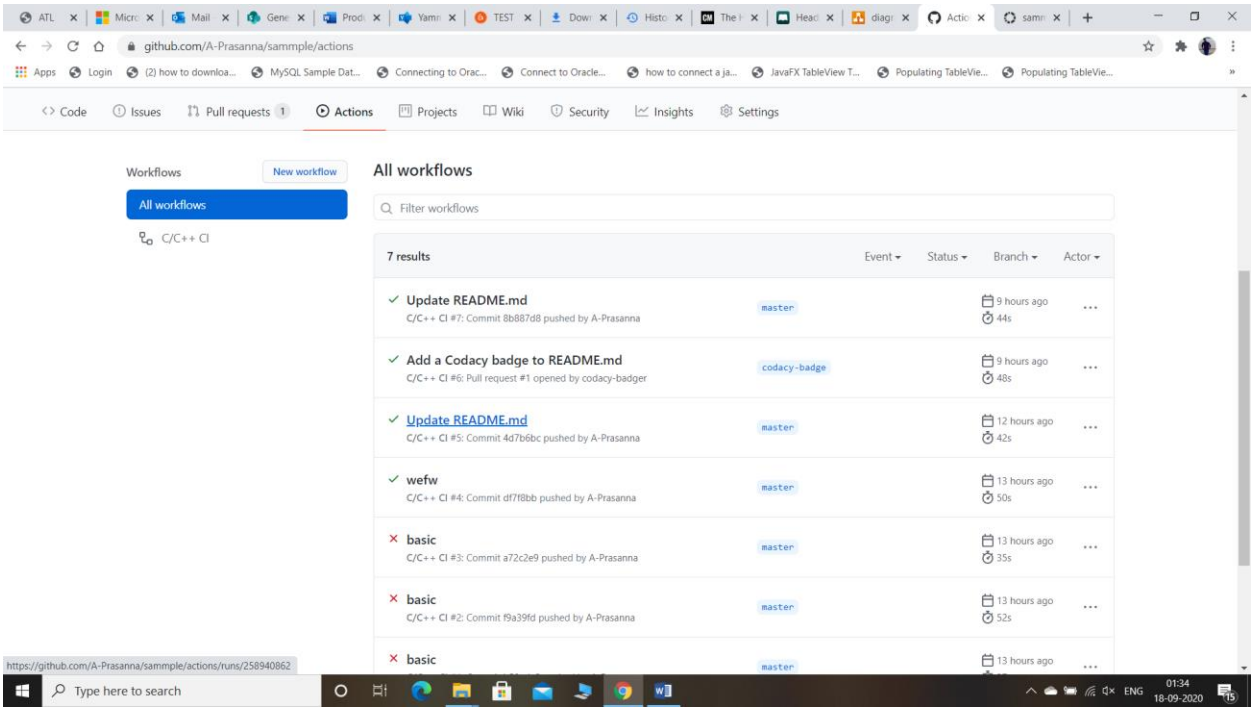
9. Continuous integration and continuous delivery [8]

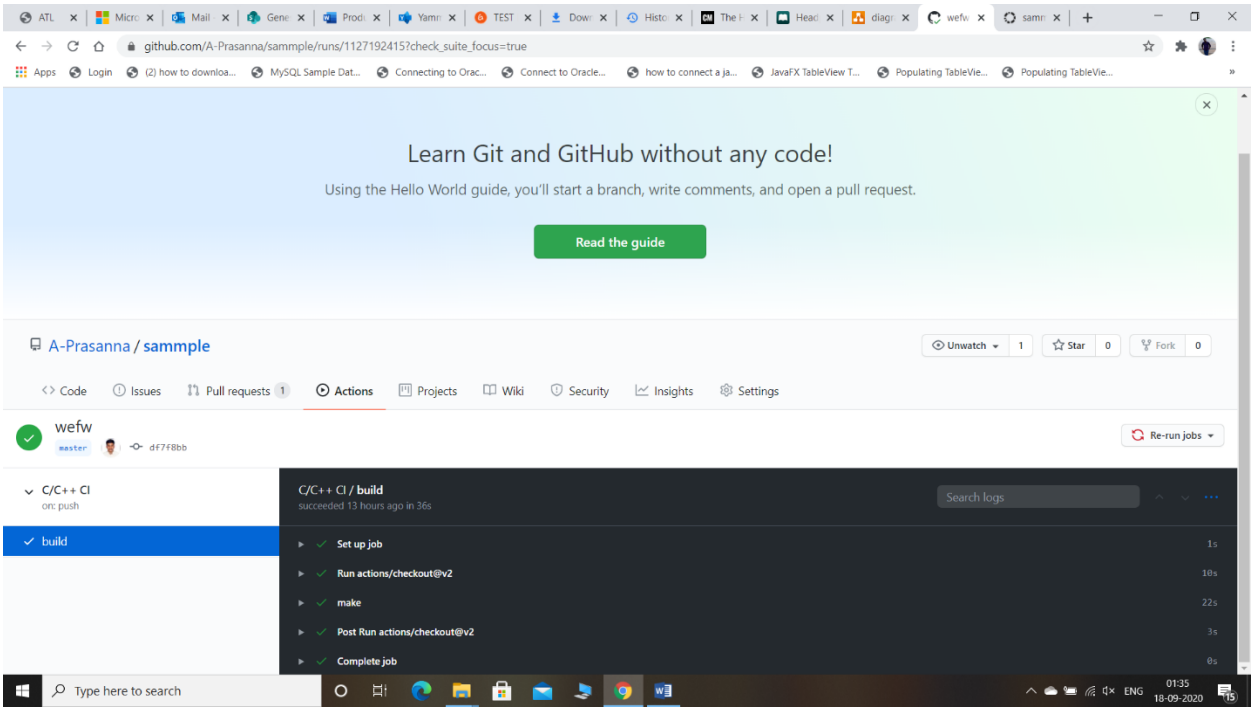
Git



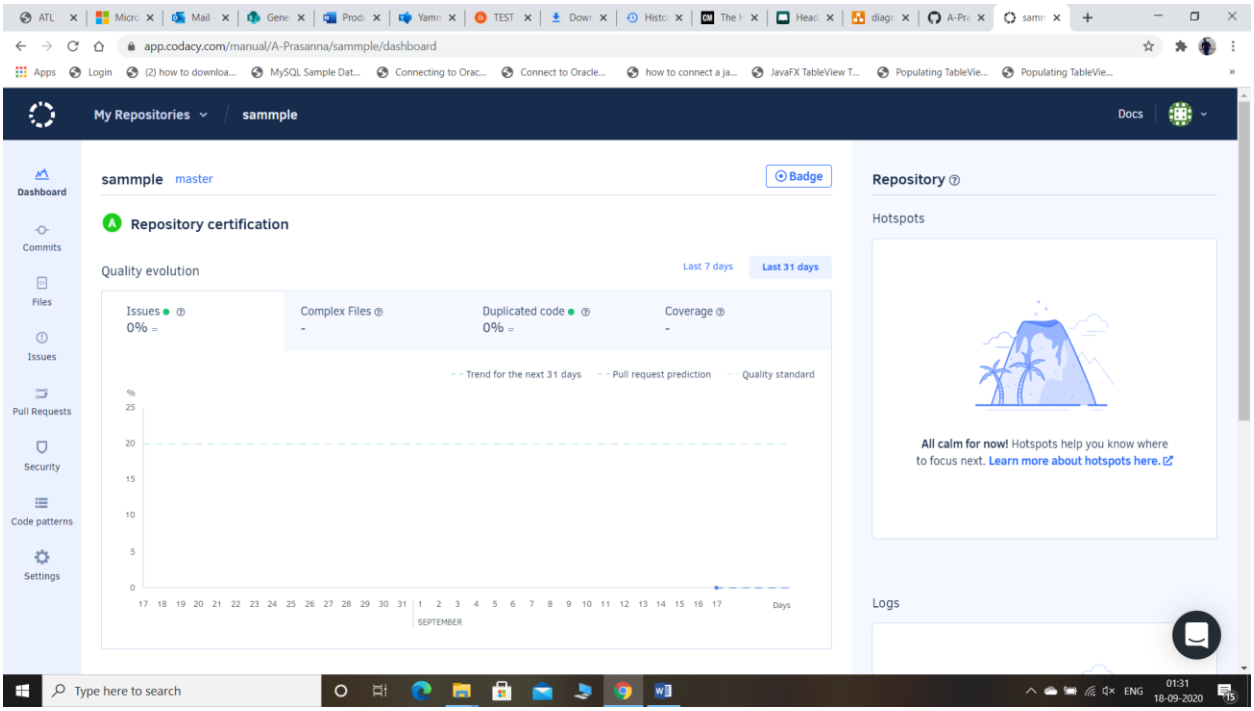


Make and build





Code quality



10. Agile model user stories

User story 1 - High-level description of headphones

The headphones must get connected to the connecting device using Wi-Fi technology. Where the connecting device like a mobile or laptop will contain a Wi-Fi sender or also termed as hotspot creator and headphones will have a Wi-Fi receiver or Wi-Fi connectivity. In the case of Wi-Fi failure, the headphone must enable Bluetooth connectivity to avoid system failure. The range must be high so that both the devices are far from each other and keeps working. The headphone will have a voice assistant the bits of help to recognize the voice and can do tasks based on user requirements.

User story 2 - Low-level description of headphones

The headphone will have four buttons mainly, the first button to raise the volume and long press of the high volume button the audio is forwarded with 10 seconds, similarly, the second button to lower the volume and long-press enables backward for 10 seconds. The third button is the pause/play button that helps to play and pause audio remotely. The fourth button is the voice assistant button that enables voice assistant from the headphone.

User story 3 – Components of headphones

The headphones should contain a battery for power supply for headphones to be active, DAC to convert digital to analog data. It should contain a mic to hear from the user and the second mic to get the external noise for noise cancellation. The main connecting device is Wi-Fi module the is attached to headphone to connect to the connecting device. Amplifier to amplify the signals.

References

[1] https://techterms.com/definition/headphones

[2] https://coolmaterial.com/roundup/history-of-headphones/

[3] https://www.flipkart.com/headphones-store

[4] https://www.tutorialspoint.com/uml/uml_standard_diagrams.htm

[5] https://app.diagrams.net/#:~:text=diagrams.net%20(formerly%20draw.,%E2%84%A2%20and%20Lucidchart%E2%84%A2%20files%20.

[6]https://www.researchgate.net/figure/Samples-of-high-and-low-level-requirements_fig1_283315841

[7] https://www.guru99.com/what-everybody-ought-to-know-about-test-planing.html

[8] https://github.com/A-Prasanna/sammple

APPENDIX

https://github.com/A-Prasanna/sammple/blob/master/inc/adder.h

```
#ifndef
__ADDER_H__
              #define __ADDER_H__


              int adder(int a, int b, int c);


              #endif
```

https://github.com/A-Prasanna/sammple/blob/master/src/adder.c

```
#include
"adder.h"
            #include <stdio.h>


            int adder(int a, int b, int c)
            {
                return (a+b+c);
            }
```

https://github.com/A-Prasanna/sammple/blob/master/Makefile

```
SRC =
src/adder.c\
               main.c


               INC = -Iinc


               PROJECT_NAME = adder.exe


               $(PROJECT_NAME): $(SRC)
```

```
                gcc $(SRC) $(INC) -o $(PROJECT_NAME)


            run:$(PROJECT_NAME)
                ./${PROJECT_NAME}
```

https://github.com/A-Prasanna/sammple/blob/master/main.c

```
#include
"adder.h"
            #include<stdio.h>


            int adder(int, int, int);


            int main()
            {
                int sum = adder(12,13,14);
                printf("%d", sum);
                return 0;
            }
```

LTTS PROJECT REPORT

RPM ALGORITHM(RSA,MONOALPHABETIC AND POLYALPHABETIC CIPHER)

Prepared by

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Chapter 1

INTRODUCTION

1. RSA Algorithm

RSA algorithm is asymmetric cryptography algorithm. Asymmetric actually means that it works on two different keys i.e. **Public Key** and **Private Key.** As the name describes that the Public Key is given to everyone and Private Key is kept private.

An example of asymmetric cryptography:

1. A client (for example browser) sends its public key to the server and requests for some data.
2. The server encrypts the data using client's public key and sends the encrypted data.
3. Client receives this data and decrypts it.

2. Monoalphabetic cipher

A Monoalphabetic cipher is any cipher in which the letters of the plain text are mapped to cipher text letters based on a single alphabetic key. Examples of Monoalphabetic ciphers would include the Caesar-shift cipher, where each letter is shifted based on a numeric key, and the atbash cipher, where each letter is mapped to the letter symmetric to it about the centre of the alphabet.

3. Polyalphabetic cipher

A polyalphabetic cipher is any cipher based on substitution, using multiple substitution alphabets. The Vigenère cipher is probably the best-known example of a polyalphabetic cipher, though it is a simplified special case.

1.1 Objectives

- To know the working of RSA, Monoalphabetic and Polyalphabetic algorithm.
- To implement a menu based program to implement RSA, Monoalphabetic and Polyalphabetic algorithm.
- To work with continue integration and continuous deployment with GitHub.

1.2 Problem Statement

To design and develop a menu based program which includes RSA, Monoalphabetic and Polyalphabetic algorithm and build it and check integrity using GitHub.

1.3 SWOT Analysis

Strength:

- The main aim is to implement RSA, Monoalphabetic and Polyalphabetic algorithm which helps to learn all three algorithms
- By this algorithm we can understand the fluency of work flow in all algorithm.

Weakness:

- The main drawback of these algorithms is as they are known algorithm cracking them will be easier

Opportunities:

- This algorithm is implemented in cryptography and network security
- It can used in end to end communication of data like WhatsApp and telegram.

Threats:

- The main threat of this algorithm is it is a menu based algorithm.

1.4 Requirements

1.4.1 High-level requirements

ID	DESCRIPTION
HL_01	The basic understanding of RSA, Monoalphabetic and polyalphabetic algorithm is must and need to know the implementation in c language
HL_02	The program shall work on different level of inputs.
HL_03	The program shall provide is implementation for different algorithm in based format

Table 1.1: High level requirements

1.4.2 Low-level requirements

ID	DESCRIPTION
LL_01_HL01	The algorithm shall do both encryption and decryption of given data.
LL_02_HL02	Different text, number and other special characters can be given as input
LL_03_HL03	Three algorithm can work based on user input on menu based process.

Table 1.2: High level requirements

Chapter 2

DESIGN

2.1 Class diagram

The below figure shows the class diagram of RPM Algorithm.

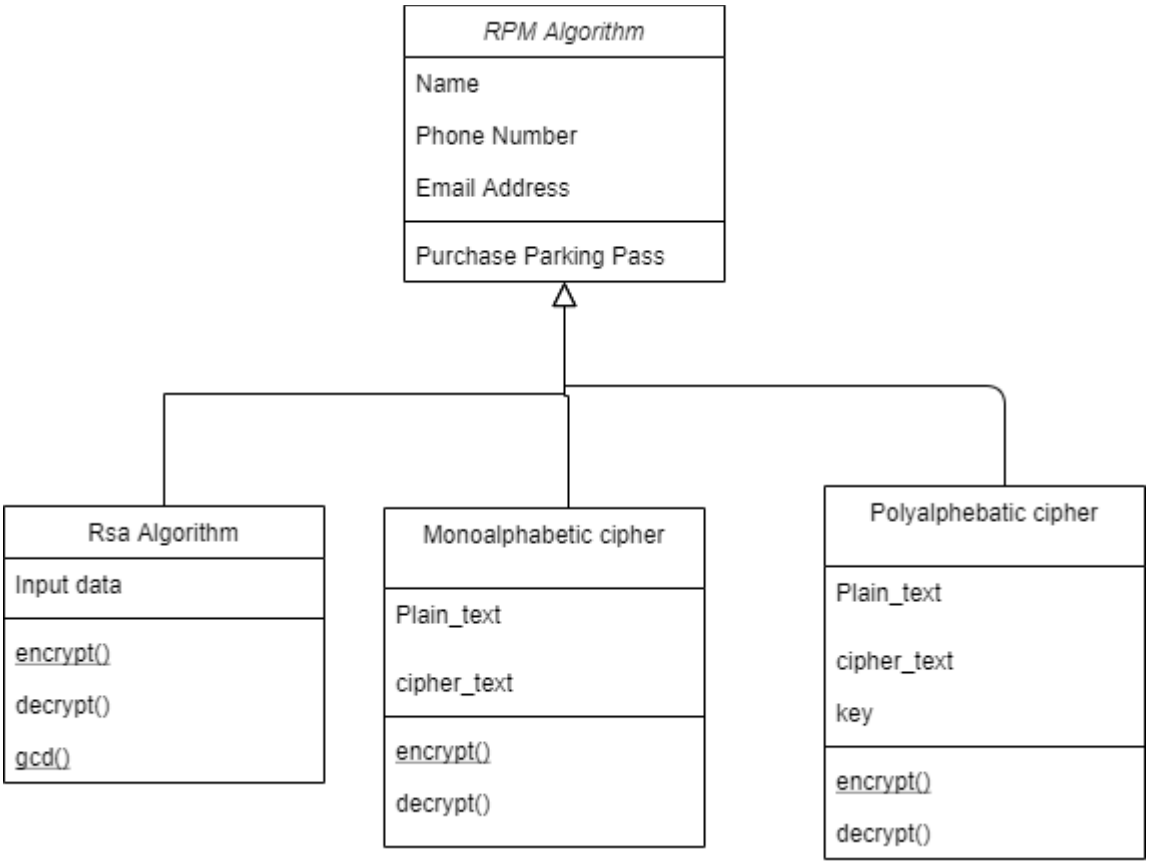

Figure 2.1: Class diagram of proposed system

2.2 Flow diagram

The below figure shows the flow diagram of RPM Algorithm.

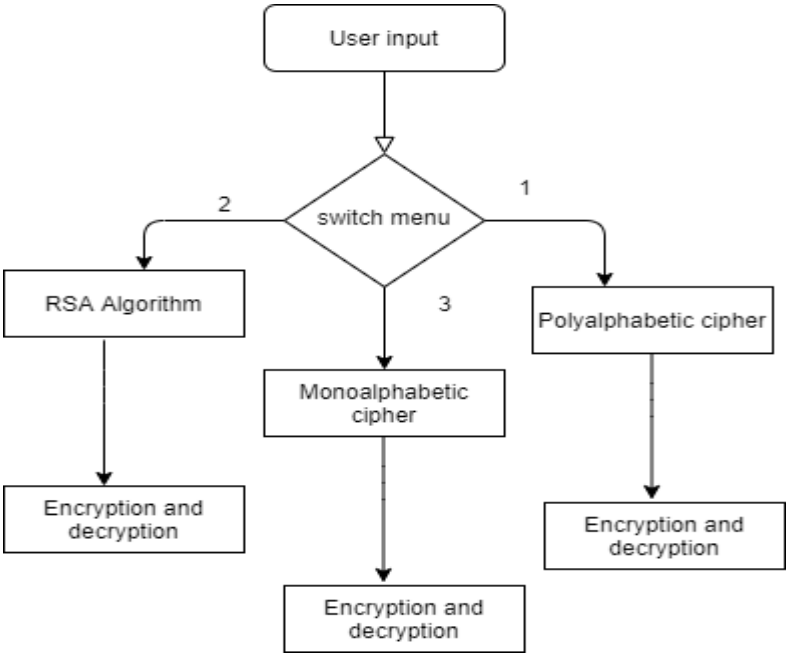

Figure 2.2: Flow diagram of proposed system

2.3 Use-case diagram

The below figure shows the use-case diagram of RPM Algorithm.

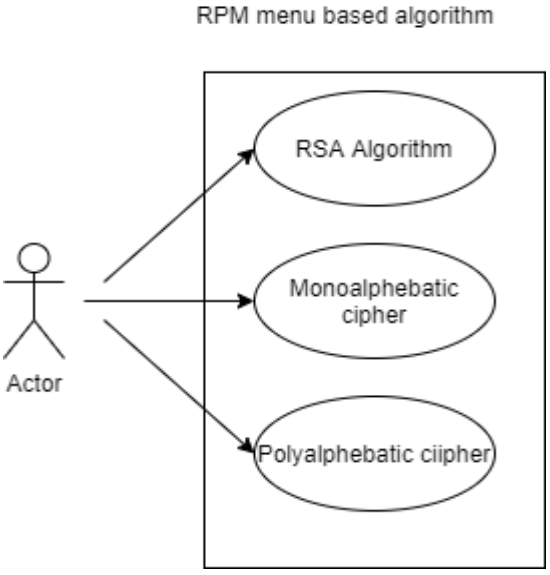

Figure 2.3: use case diagram of proposed system

2.4 State diagram

The below figure shows the state diagram of RPM Algorithm.

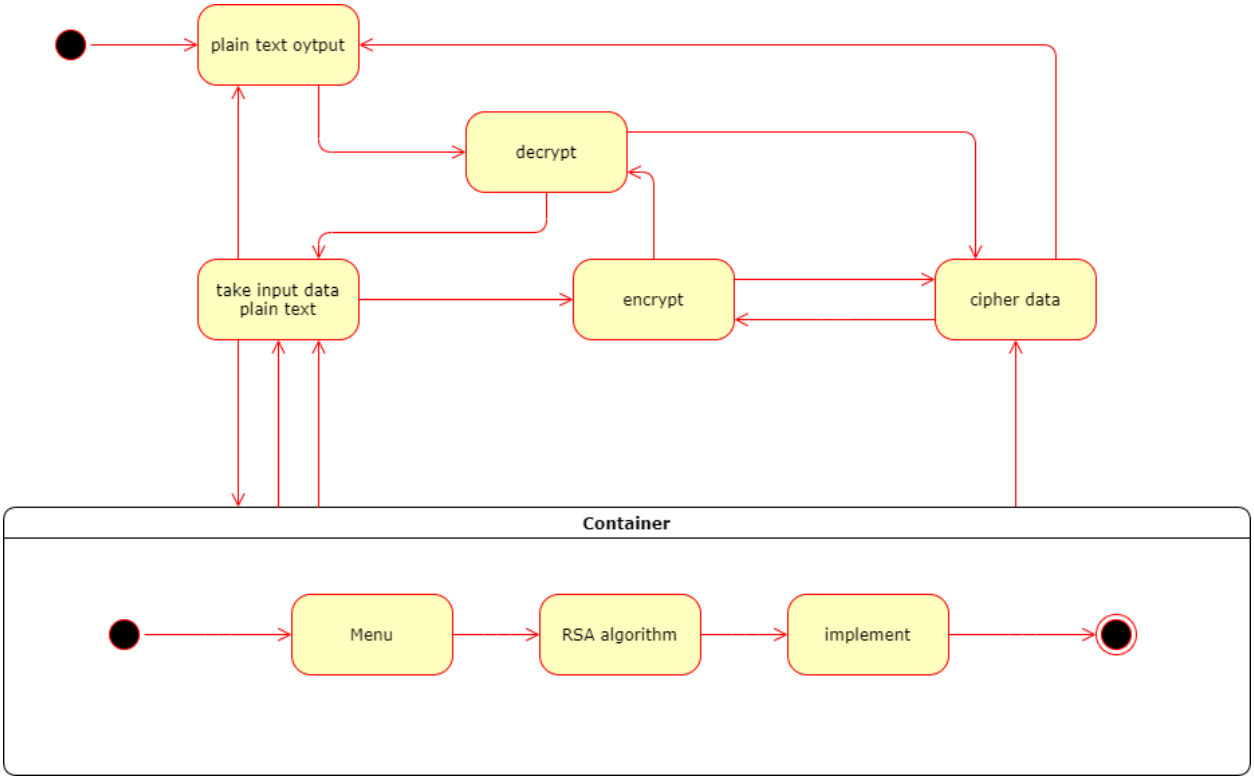

Figure 2.4: State diagram of proposed system

Chapter 3

TESTING

High-level test plan

ID	DESCRIPTION	PRE-CONDITION	EXPECTED INPUT	EXPECTED OUTPUT	ACTUAL OUTPUT
HL_01	Simple input	RSA Algorithm	P:13,14 Da:1234	Enc:142 Dec:1234	Enc:142 Dec:1234
HL_02	Complex input	RSA Algorithm	P:7919,7901 Da:15	Enc:45723337 Dec :15	Enc:4572337 Dec:15
HL_03	Varying input	RSA Algorithm	P:100003, 198733 Da:4543	Enc: 1082534029 Dec:4543	Enc: 1082534029 Dec:1140

Table 3.1: High level test plan for RSA algorithm

ID	DESCRIPTION	PRE-CONDITION	EXPECTED INPUT	EXPECTED OUTPUT	ACTUAL OUTPUT
HL_01	Simple input	Monoalphabetic cipher	Prasanna	Kizhzmmz	Kizhzmmz
HL_02	Complex input	Monoalphabetic cipher	12345	Cant work	Cant work
HL_03	Varying input	Monoalphabetic cipher	Larsen and tubro	Ozihvm ier uehre	Ozihvm

Table 3.2: High level test plan for Monoalphabetic algorithm

ID	DESCRIPTION	PRE-CONDITION	EXPECTED INPUT	EXPECTED OUTPUT	ACTUAL OUTPUT
HL_01	Simple input	Monoalphabetic cipher	Da: Larsen Key: Tubro	Ci: eusjsg Pl: larsen	Ci: eusjsg Pl: larsen
HL_02	Complex input	Monoalphabetic cipher	Da: Larsenandtubro Key: bitm	Ci: mikefvtzebnnsw Pl: larsenandtubro	Ci: mikefvtzebnnsw Pl: larsenandtubro
HL_03	Varying input	Monoalphabetic cipher	Da: 1234apr Key: 1234	Ci: OQSUK[^ Pl: 1234apr	Ci: OQSUK[^ Pl: efghapr

Table 3.3: High level test plan for polyalphabetic algorithm

Low-level test plan

ID	DESCRIPTION	PRE-CONDITION	EXPECTED INPUT	EXPECTED OUTPUT	ACTUAL OUTPUT
LL_01_HL01	Simple input	RSA Algorithm	P:100003, 198733 Da:4543	Enc: 1082534029 Dec:4543	Enc: 1082534029 Dec:1140
LL_02_HL02	Simple input	Monoalphabetic cipher	Larsen and tubro	Ozihvm ier uehre	Ozihvm
LL_03_HL03	Simple input	Polyalphabetic cipher	Da: 1234apr Key: 1234	Ci: OQSUK[^ Pl: 1234apr	Ci: OQSUK[^ Pl: efghapr

Table 3.4: low - level test plan for proposed algorithm

Chapter 4

SCREENSHOTS

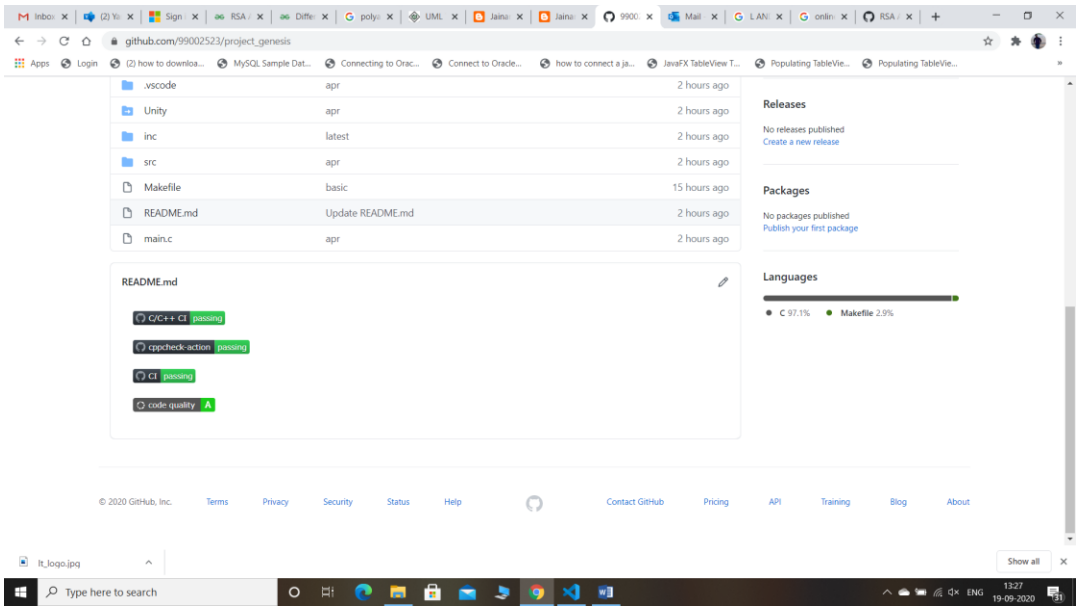

Image 10.1: Home page screen shot

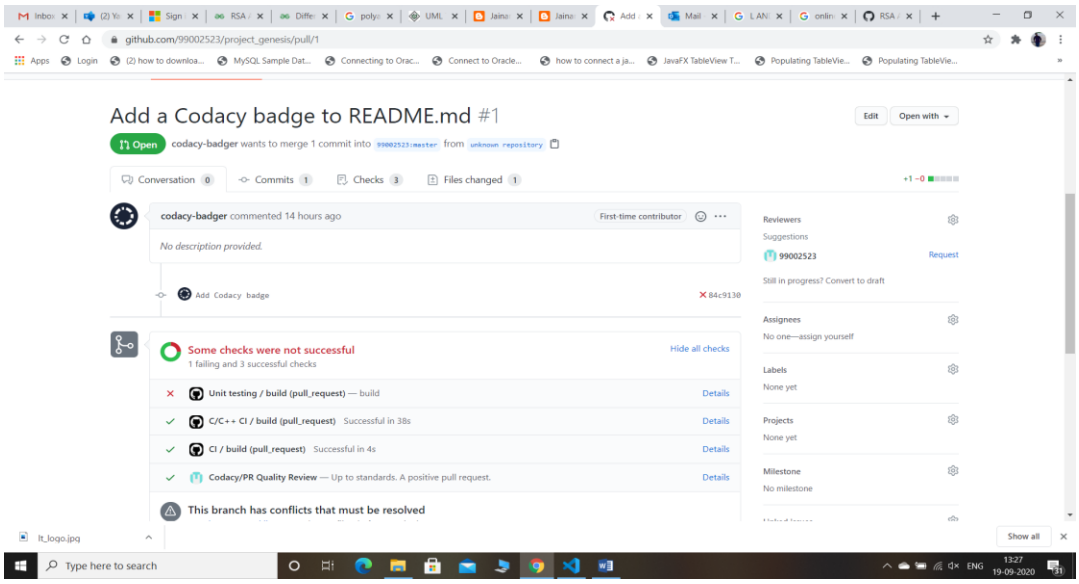

Image 10.2: compilation of code screen shot

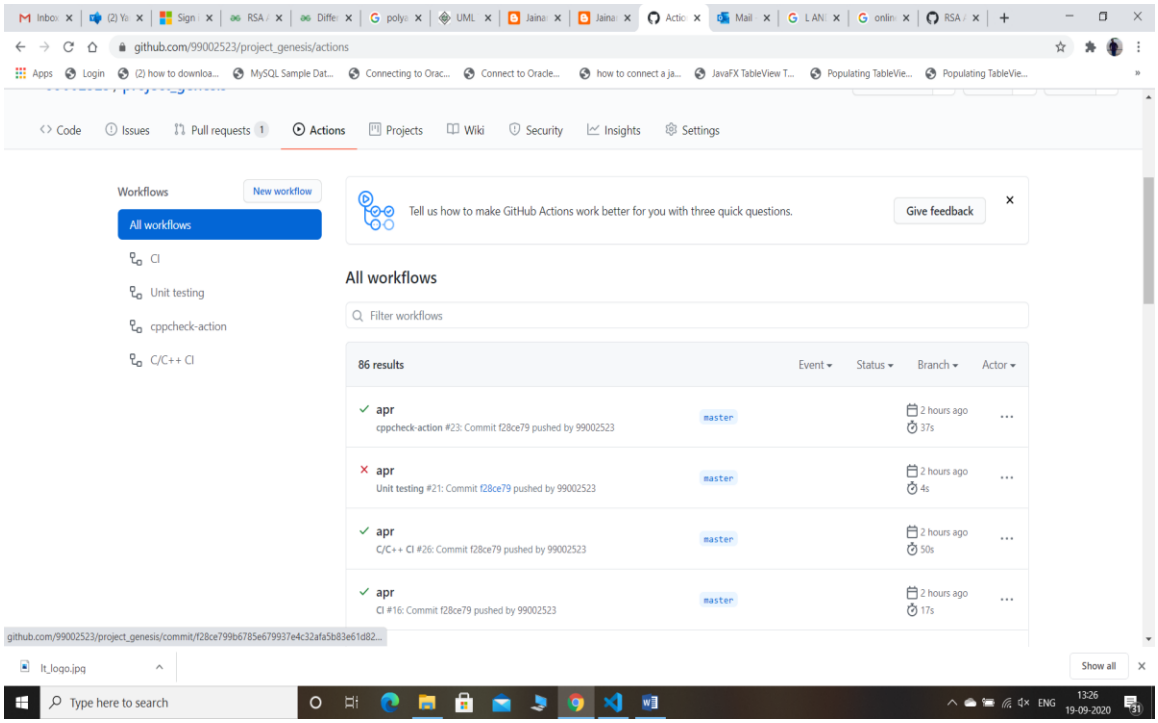

Image 10.3: workflow of code screen shot

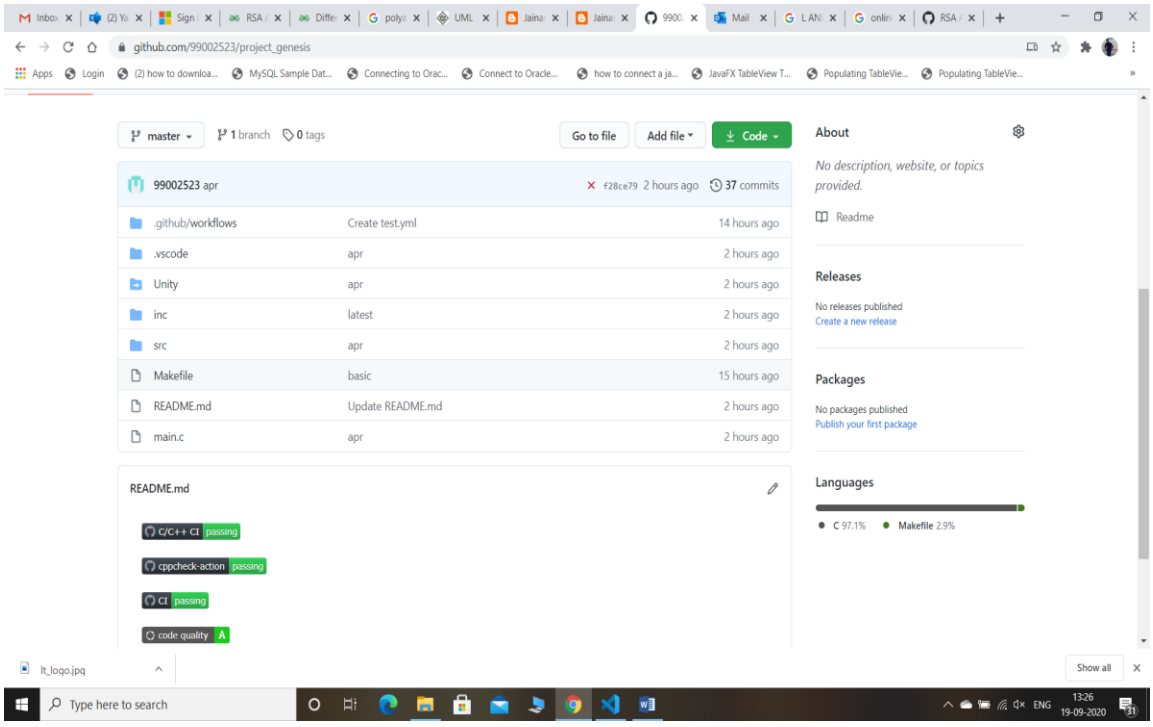

Image 10.4: Badges screen shot

References

[1] https://app.diagrams.net/?libs=general;flowchart

[2] https://www.tutorialspoint.com/uml/index.htm

[3]https://jainamtechno.blogspot.com/2018/08/implement-monoalphabetic-cipher_15.html#:~:text=Better%20than%20Caesar%20Cipher.&text=This%20is%2010%20orders%20of,however%2C%20another%20line%20of%20attack.

[4] https://jainamtechno.blogspot.com/2018/08/implement-polyalphabetic-cipher.html?m=0

[5] https://app.codacy.com/projects

[6] https://www.geeksforgeeks.org/rsa-algorithm-cryptography/

[7] https://www.geeksforgeeks.org/difference-between-monoalphabetic-cipher-and-polyalphabetic-cipher/

APPENDIX

Link for git hub account

https://github.com/99002523/project_genesis