



SAN JOSÉ STATE
UNIVERSITY

Deliverable #3 - Test Automation and Script

Chatbot AI Testing - Kuki.AI

Group 4

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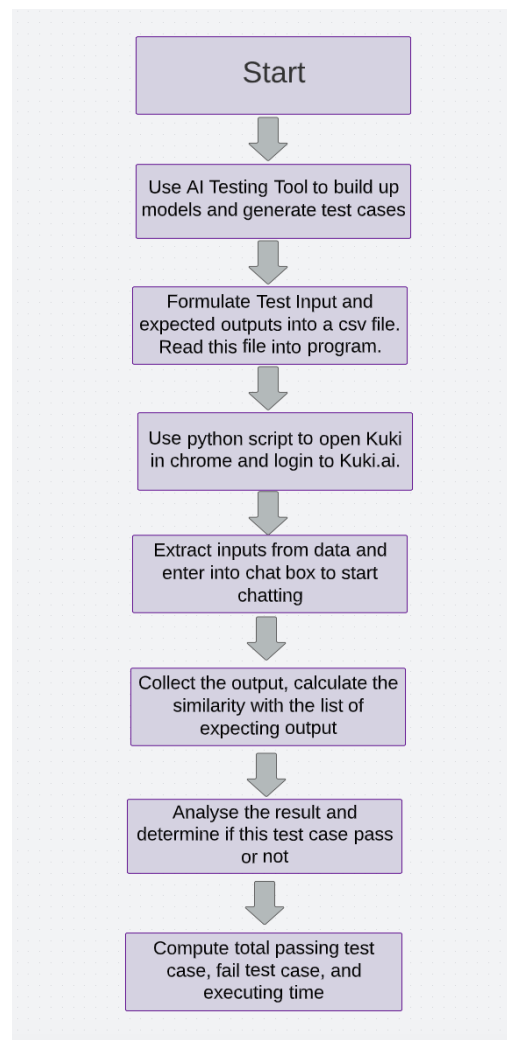
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1. Test Automation Strategies

1.1. Tools used for automation testing

- Selenium
- Python
- AI tool
- Chrome Driver
- Visual Studio

1.2. Automation Testing Program Flow



2. Testing Script

```
# This is a sample Python script.
import matplotlib.pyplot as plt
import pytest
import numpy as np
import time
import json
import csv
import spacy
import undetected_chromedriver.v2 as uc
from selenium import webdriver
from selenium.webdriver.common.by import By
from selenium.webdriver.common.action_chains import ActionChains
from selenium.webdriver.support import expected_conditions
from selenium.webdriver.support.wait import WebDriverWait
from selenium.webdriver.common.keys import Keys
from selenium.webdriver.common.desired_capabilities import DesiredCapabilities

def pieplot(pos, neg, title, fname):
    fig1, ax1 = plt.subplots()
    ax1.pie([(pos/(pos+neg))*100, (neg/(pos+neg))*100], labels=['Passed', 'Failed'], autopct='%1.1f%%', shadow=True, startangle=90, colors=['#23C552', '#F84F31'])
    ax1.axis('equal')
    ax1.set_title(title)
    plt.savefig(fname)

def barplot(labels, poslist, neglist, title):
    X_axis = np.arange(len(labels))
    #fig, ax = plt.subplots()
    plt.bar(X_axis - 0.2, poslist, 0.4, label="Passed", color='g')
    plt.bar(X_axis + 0.2, neglist, 0.4, label="Failed", color='r')
    plt.xticks(X_axis, labels)
    plt.xlabel("Category")
    plt.ylabel("Count")
    plt.title("AI testing Summary")
    plt.legend()
    plt.savefig(title)

class TestScriptsSample():
    def __init__(self):
        self.driver = uc.Chrome()
        self.positive = 0
        self.negative = 0
        self.start_time = time.time()

    def read_data(self, filename):
        with open(filename, encoding='mac_roman') as csvfile:
            reader = csv.reader(csvfile)
            self.data = list(reader)[1:]

    def preprocess_word(self, word):
        word = word.lower()
        res = ''
        for s in word:
            if s.isalpha() or s == ' ' or s.isnumeric():
                res += s
        return res
```

```

def test_scriptsample(self):
    self.driver.get("https://chat.kuki.ai/chat")
    self.driver.set_window_size(1258, 1040)
    element = self.driver.find_element(By.CSS_SELECTOR, ".g-sign-in-button .text-container > span")
    actions = ActionChains(self.driver)
    actions.move_to_element(element).click_and_hold().perform()
    element = self.driver.find_element(By.CSS_SELECTOR, ".g-sign-in-button > .content-wrapper")
    actions = ActionChains(self.driver)
    actions.move_to_element(element).release().perform()
    self.driver.find_element(By.CSS_SELECTOR, ".g-sign-in-button > .content-wrapper").click()
    self.driver.implicitly_wait(5)
    loginBox = self.driver.find_element(by=By.XPATH, value='//*[@id="identifierId"]')
    loginBox.send_keys("kuki.masapeta@gmail.com")
    nextButton = self.driver.find_elements(by=By.XPATH, value='//*[@id="identifierNext"]')
    nextButton[0].click()
    self.driver.implicitly_wait(7)
    try:
        passWordBox = self.driver.find_element(by=By.XPATH, value='//*[@id="password"]/div[1]/div / div[1]/input')
    except:
        self.driver.implicitly_wait(7)
        passWordBox = self.driver.find_element(by=By.XPATH, value='//*[@id="password"]/div[1]/div / div[1]/input')
    passWordBox.send_keys("Kuki1997")
    nextButton = self.driver.find_elements(by=By.XPATH, value='//*[@id="passwordNext"]')
    nextButton[0].click()
    nlp = spacy.load('en_core_web_sm')
    cid = "pb-bot-response"
    time.sleep(5)
    for i in range(len(self.data)):
        try:
            in_message = self.data[i][0]
            out_messages = self.data[i][1]
            out_messages = out_messages.split(",")
            time.sleep(5)
            self.driver.find_element(By.CSS_SELECTOR, "input").send_keys(in_message)
            self.driver.find_element(By.CSS_SELECTOR, "input").send_keys(Keys.ENTER)
            time.sleep(2)
            ids = self.driver.find_elements(By.CLASS_NAME, cid)
            output = ids[-1].text
            output = self.preprocess_word(output)
            real_out = nlp(output)
            similar = 0
            for out_message in out_messages:
                wish_out = nlp(out_message)
                simi2 = real_out.similarity(wish_out)
                similar = max(similar, simi2)

            print("Test case %s:" % str(i))
            print("Input: %s" % in_message)
            print("Output: %s" % output)
            if similar > 0.30:
                self.positive += 1
                print("True")
            else:
                self.negative += 1
                print("False")
            print()
        except:
            continue

```

```

if __name__ == '__main__':
    dk_sample = TestScriptsample()
    dk_sample.read_data("domain_knowledge1.csv")
    dk_sample.test_scriptsample()
    end_time = time.time()
    print("Total positive results for Domain Knowledge Testing: %d" % dk_sample.positive)
    print("Total negative results for Domain Knowledge Testing: %d" % dk_sample.negative)
    print("Total time consuming for Domain Knowledge Testing: %d" % (end_time-dk_sample.start_time))
    dk_positives = dk_sample.positive
    dk_negatives = dk_sample.negative
    pieplot(dk_positives,dk_negatives,"PieChart for Domain Knowledge Testing","DK_PieChart.png")

    cm_sample = TestScriptsample()
    cm_sample.read_data("chat_memory1.csv")
    cm_sample.test_scriptsample()
    end_time = time.time()
    print("Total positive results for Chat Memory Testing: %d" % cm_sample.positive)
    print("Total negative results for Chat Memory Testing: %d" % cm_sample.negative)
    print("Total time consuming for Chat Memory Testing: %d" % (end_time-cm_sample.start_time))
    cm_positives = cm_sample.positive
    cm_negatives = cm_sample.negative
    pieplot(cm_positives,cm_negatives,"PieChart for Chat Memory Testing","CM_PieChart.png")

    cp_sample = TestScriptsample()
    cp_sample.read_data("chat_pattern1.csv")
    cp_sample.test_scriptsample()
    end_time = time.time()
    print("Total positive results for Chat Pattern Testing: %d" % cp_sample.positive)
    print("Total negative results for Chat Pattern Testing: %d" % cp_sample.negative)
    print("Total time consuming for Chat Pattern Testing: %d" % (end_time-cp_sample.start_time))
    cp_positives = cp_sample.positive
    cp_negatives = cp_sample.negative
    pieplot(cp_positives,cp_negatives,"PieChart for Chat Pattern Testing","CP_PieChart.png")

    qa_sample = TestScriptsample()
    qa_sample.read_data("qa_testing1.csv")
    qa_sample.test_scriptsample()
    end_time = time.time()
    print("Total positive results for QA Testing: %d" % qa_sample.positive)
    print("Total negative results for QA Testing: %d" % qa_sample.negative)
    print("Total time consuming for QA Testing: %d" % (end_time-qa_sample.start_time))
    qa_positives = qa_sample.positive
    qa_negatives = qa_sample.negative
    pieplot(qa_positives,qa_negatives,"PieChart for Q&A Testing","QA_PieChart.png")

    labels = ['Domain Knowledge', 'Chat Memory', 'Chat Pattern', 'QA_Testing']
    poslist = [dk_positives,cm_positives,cp_positives,qa_positives]
    neglist = [dk_negatives,cm_negatives,cp_negatives,qa_negatives]
    barplot(labels,poslist,neglist,"AI Testing Summary.png")

```

3. Testing Cases

3.1. Domain Knowledge

Requests	Responses
Hi	[Hello, Hi there,Good Morning,Good Afternoon,Nice to see you back, How are you, Good to see you back, Oh hey,hi there chelsey]
What do you like to do, Kuki?	[I like chatting with people, I like play games, I like reading]
I like watching movies	[Good to hear, good for you, you like watching movies]

What's your favorite movie?	[I like Terminator. Have you seen it?, What movies do you like?]
Do you like the movie "Bambi"?	[Yes it's a good movie, I thought it was a sad movie]
I watched 2 movies today	[Did you like them, how were the movies, ah how was it]
One movie was a horror, it was very scary.	[Oh is it, I see]
Do you think kids can watch horror movies?	[I'll ask around and get back to you, I don't think so]
In which year was the movie "Home Alone" released?	[1990]
I like "Home Alone" movie a lot. I watch that movie every year during the christmas.	[You like home alone movie, it was ok I haven't been to cinema in years]
What genre movies do you like?	[any really, I like all genre, I like thrillers]
Can you list a few movie genre.	[Thrillers, horrors, comedies, romantic]
Do you like thriller movies or horror movies?	[Thrillers, not horror I'm really scared, I like them both, Mostly thrillers]
What is your favorite thriller movie?	[Terminator, Is it a thriller, I like them all]
Can you suggest me a thriller movie	[Let me think, I like them all]
Who is the director of the movie "Parasite"?	[No idea, Let me guess, Bong Joon-ho]
What do you think about the movie "Titanic"?	[It's is romantic movie, I really love it, the film was too long for me]
When was the movie titanic released?	[1997, In the year 1997]
I'm completely into romantic movies these days	[Of course, you like romantic movies, that's cool, even I like romantic movies]
Do you like watching movies?	[I certainly do, Yes of course]

Don't you like any other movie apart from terminator	[No I have never seen one]
What is the genre of the movie the ÒNotebookÓ?	[I think it's a romantic drama, Indian Hindi language romaintic movie]
Do you like the movie ÒBabyÓs dayoutÓ?	[I have never seen one, Is it good, do you like it?]
I think horror movies are the best	[I don't like things that are scary, Ok horror movies are the best, you like horror movies]
Do you know a best Hindi movie?	[I don't know, can you list them for me, I like them all]
Can kids watch the ÒParasiteÓ movie?	[I don't think so, itÓs a depressing movie, not suggestable for kids]
Is "21 Jump Street" a comedy movie?	[it is a american comedy movie, Yes it is]
Kuki,what do you think about the movie ??Love Actually???	[I really like this movie, Never heard of it, What is it about]
I really like the movie "The Titanic"	[I really like this movie, Never heard of it,Good to hear, Wonderful, Titanic is a great movie]
Do you think kids will like ÒToy StoryÓ?	[Good chance, I can't say that for sure, probably not, I think so]
What is the most watched genre among teens?	[Romantic, comedies, Thrillers, horrors, scifi]
What is the viewer rating for the movie ÒBlack PantherÓ?	[96%, 7.3, 3, I'm not sure]
Is ÒMission MangalÓ a hindi movie?	[Indian Hindi language drama film, Yes it is, Of course]
Do you know about the animation movie ÒWall-EÓ?	[Of course I do, It's a good movie, good computer animated science fiction movie]
Kuki,what do you think about Harry Potter movies	[Harry Potter is a great film series, I really like those movies]
How many parts does the Harry Potter film series have?	[8, eight]

What is your favorite thriller movie?	[Terminator, Is it a thriller, I like them all]
How do you rate the movie Love Story?	[Seems Pretty good to me, It's a good one, I really love it]
Name one of you favorite korean movies	[Parasite, I like them all]
Do you know the actor brad pitt	[Yes of course, He is a hunky american actor, I love him]
When was Robocop movie released?	[1987, Not sure]
Do you like the movie 101 dalmations?	[Yes, I do, good movie]
Inside man is a good thriller movie	[Ok I'll note that, Okay, Compared that to a bad thriller movie]
What is IMDb rating?	[Online database of information related to movies, fan operated movie database]
Have you watched Avatar movie?	[Not yet but would like to watch it, It looks like a great film, I haven't seen avatar yet but many people said it is really good]
Which language movie are the best?	[Russain, English, Korean, German]
Who is the director of Fight Club movie?	David Fincher
Do you think everyone can watch the movie "Anabelle"?	[Not sure, I don't think everyone can]
Is 20th century girl movie a korean movie?	[South Korean romance drame film]
Have you watched the movie "3 idiots"?	[Not recently, yes of course, it's a good movie]
Name a few Thriller movies	[Terminator, Is it a thriller, I like them all]
What is your favorite thriller movie?	[I like them all, Terminator]

Did you watch any romantic movies recently?	[I like Terminator. Have you seen it?, What movies do you like?]
Is Midnight Sun movie a romantic movie?	[Midnight sun is a 2018 American Romantic drama film]
Name a best horror movie	[Robocop, Annabelle]
Do you think kids will like "Annabelle" movie?	[How should I know, May be, I'm not sure]
Which movie is your favorite horror movie?	[My favorite movie is terminator, Have you seen it?]
Do you prefer happy or sad endings in a movie?	[I think I do too. It makes people feel good inside if they are happy, I can see how I can get into sad endings]
Home alone movie is a comedy movie	[Yes, That right, The movie seemed pretty stupid to me]
Which comedy movie do you like?	[PK, The Big Bang Theory, Home alone]
Who is the director of "Annabelle" movie?	[John R. Leonetti, No idea]
Name a Hindi movie you like	[I like them all, PK]
Do you know about the movie "Dilwale"?	[Image from en.wikipedia.org]
What is the age restriction for movies?	[Above 18 and below 18]
What movies can kids watch?	[Titanic, Toy Story, Cars]
Can people below 18 years of age watch conjuring movie?	[I don't think so]
What's the title of the last movie you watched?	[I like Terminator. Have you seen it?, What movies do you like?]
How good is the movie "Dilwale"?	[Dilwale, It is a good movie]
Name a best Korean movie	[21st century girl, train to busan, parasite]
Which language movies do you like?	[German]

Do you like korean movies?	[Yes, Not all, Just a few, My favorite movie is terminator]
Do you only like terminator movie?	[Oh yes, its my favorite movie]
do you like any other movie apart from terminator?	[Of course not, I like few other movies too]
Do you like hindi language movies?	[Of course not, I like few other movies too]
did you watch '3 idiots' movie?	[Image from en.wikipedia.org]
Do you like 'Robo' movie?	[I like everything about robots]
Is "train to busan" movie a thriller movie?	[Yes it is, Of course]
Do you like zombie movies?	[My favorite movie is terminator, Have you seen it?, No I don't]
What movie do you like, Kuki?	[My favorite movie is terminator, Have you seen it?]
Do you hate any movie?	[May a few, I don't hold grudges]
Which language movies do you prefer?	[English, Korean, German]
Which genre movies do you like the most?	[I like them all, Terminator]
What did you like best about the movie?	[I have a lot of good experiences with movies]
What's your favorite movie of all time?	[My favorite movie is terminator, Have you seen it?]
Do you like animated movies?	[My favorite movie is terminator, Have you seen it?]
Is going to the movies too expensive?	[May be, Thirtty camels and a goat]
How long should a movie be?	[not morethan 3 hours]
Do you think age restrictions for films are effective?	[May be, not sure, I guess]

name a few Movies that are about the future and modern technology	[Terminator, Is it a thriller, I like them all]
What is the best movie you have ever seen?	[Terminator, Is it a thriller, I like them all]
Who is your favorite actor or actress?	[Eddie Murphy]
See any good movies lately?	[Terminator, Robocop]
Are you addicted to watching movies?	[Of course not, No, I'm not]
Who is your favorite movie hero?	[Eddie Murphy]
What is your favorite classical movie?	[I like them all, Terminator]
What does it mean if a movie "bombs"?	[A box-office bomb or box-office disaster]
Which horror movie is the scariest?	[Many, I think annabelle]
Do you prefer classic films or westerns?	[I'm a big fan of classics]
Which movie has the best story?	[My favorite movie is terminator, Have you seen it?]
What do you like to do, Kuki?	[I like chatting with people, I like play games, I like reading]
I like watching movies	[Good to hear, good for you, you like watching movies]
What's your favorite movie?	[I like Terminator. Have you seen it?, What movies do you like?]
Do you like the movie "Bambi"?	[Yes it's a good movie, I thought it was a sad movie]
I watched 2 movies today	[Did you like them, how were the movies, ah how was it]
One movie was a horror, it was very scary.	[Oh is it, I see]

Do you think kids can watch horror movies?	[I'll ask around and get back to you, I don't think so]
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I like "Home Alone" movie a lot. I watch that movie every year during the christmas.	[You like home alone movie, it was ok I haven't been to cinema in years]
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When was the movie Titanic released?	[1997, In the year 1997]
I'm completely into romantic movies these days	[Of course, you like romantic movies, that's cool, even I like romantic movies]
Do you like watching movies?	[I certainly do, Yes of course]
Don't you like any other movie apart from Terminator	[No I have never seen one]
What is the genre of the movie The Notebook?	[I think it's a romantic drama, Indian Hindi language romantic movie]
Do you like the movie The Baby's Day Out?	[I have never seen one, Is it good, do you like it?]
I think horror movies are the best	[I don't like things that are scary, Ok horror movies are the best, you like horror movies]

Do you know a best Hindi movie?	[I don't know, can you list them for me, I like them all]
Can kids watch the "Parasite" movie?	[I don't think so, it's a depressing movie, not suggestable for kids]
Is "21 Jump Street" a comedy movie?	[it is a american comedy movie, Yes it is]
Kuki,what do you think about the movie "Love Actually"??	[I really like this movie, Never heard of it, What is it about]
I really like the movie "The Titanic"	[I really like this movie, Never heard of it,Good to hear, Wonderful, Titanic is a great movie]
Do you think kids will like "Toy Story"?	[Good chance, I can't say that for sure, probably not, I think so]
What is the most watched genre among teens?	[Romantic, comedies, Thrillers, horrors, scifi]
What is the viewer rating for the movie "Black Panther"?	[96%, 7.3, 3, I'm not sure]
Is "Mission Mangal" a hindi movie?	[Indian Hindi language drama film, Yes it is, Of course]
Do you know about the animation movie "Wall-E"?	[Of course I do, It's a good movie, good computer animated science fiction movie]
Kuki,what do you think about Harry Potter movies	[Harry Potter is a great film series, I really like those movies]
How many parts does the Harry Potter film series have?	[8, eight]
What is your favorite thriller movie?	[Terminator, Is it a thriller, I like them all]
How do you rate the movie Love Story?	[Seems Pretty good to me, It's a good one, I really love it]
Name one of you favorite korean movies	[Parasite, I like them all]
Do you know the actor brad pitt	[Yes of course, He is a hunky american actor, I love him]

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Inside man is a good thriller movie	[Ok I'll note that, Okay, Compared that to a bad thriller movie]
What is IMDb rating?	[Online database of information related to movies, fan operated movie database]
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Name a few Thriller movies	[Terminator, Is it a thriller, I like them all]
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Do you think kids will like "Annabelle" movie?	[How should I know, May be, I'm not sure]
Which movie is your favorite horror movie?	[My favorite movie is terminator, Have you seen it?]

Do you prefer happy or sad endings in a movie?	[I think I do too. It makes people feel good inside if they are happy, I can see how I can get into sad endings]
Home alone movie is a comedy movie	[Yes, That right, The movie seemed pretty stupid to me]
Which comedy movie do you like?	[PK, The Big Bang Theory, Home alone]
Who is the director of "Annabelle" movie?	[John R. Leonetti, No idea]
Name a Hindi movie you like	[I like them all, PK]
Do you know about the movie "Dilwale"?	[Image from en.wikipedia.org]
What is the age restriction for movies?	[Above 18 and below 18]
What movies can kids watch?	[Titanic, Toy Story, Cars]
Can people below 18 years of age watch conjuring movie?	[I don't think so]
What's the title of the last movie you watched?	[I like Terminator. Have you seen it?, What movies do you like?]
How good is the movie "Dilwale"?	[Dilwale, It is a good movie]
Name a best Korean movie	[21st century girl, train to busan, parasite]
Which language movies do you like?	[German]
Do you like Korean movies?	[Yes, Not all, Just a few, My favorite movie is terminator]
Do you only like Terminator movie?	[Oh yes, it's my favorite movie]
Do you like any other movie apart from Terminator?	[Of course not, I like few other movies too]
Do you like Hindi language movies?	[Of course not, I like few other movies too]
Did you watch '3 Idiots' movie?	[Image from en.wikipedia.org]
Do you like 'Robo' movie?	[I like everything about robots]

Is "train to busan" movie a thriller movie?	[Yes it is, Of course]
Do you like zombie movies?	[My favorite movie is terminator, Have you seen it?, No I don't]
What movie do you like, Kuki?	[My favorite movie is terminator, Have you seen it?]
Do you hate any movie?	[May a few, I don't hold grudges]
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Who is your favorite movie hero?	[Eddie Murphy]

What is your favorite classical movie?	[I like them all, Terminator]
What does it mean if a movie "bombs"?	[A box-office bomb or box-office disaster]
Which horror movie is the scariest?	[Many, I think annabelle]
Do you prefer classic films or westerns?	[I'm a big fan of classics]
Which movie has the best story?	[My favorite movie is terminator, Have you seen it?]
Do you know the best Hindi movie?	[I don't know, can you list them for me, I like them all]
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What is the most watched genre among teens?	[Romantic, comedies, Thrillers, horrors, scifi]
What is the viewer rating for the movie ÒBlack PantherÓ?	[96%, 7.3, 3, I'm not sure]
Is ÒMission MangalÓ a hindi movie?	[Indian Hindi language drama film, Yes it is, Of course]
Do you know about the animation movie ÒWall-EÓ?	[Of course I do, It's a good movie, good computer animated science fiction movie]
Kuki,what do you think about Harry Potter movies	[Harry Potter is a great film series, I really like those movies]

How many parts does the Harry Potter film series have?	[8, eight]
What is your favorite thriller movie?	[Terminator, Is it a thriller, I like them all]
How do you rate the movie Love Story?	[Seems Pretty good to me, It's a good one, I really love it]
Name one of you favorite korean movies	[Parasite, I like them all]
Do you know the actor brad pitt	[Yes of course, He is a hunky american actor, I love him]
When was Robocop movie released?	[1987, Not sure]
Do you like the movie 101 dalmations?	[Yes, I do, good movie]
Inside man is a good thriller movie	[Ok I'll note that, Okay, Compared that to a bad thriller movie]

3.2. Chatbot Memory

Requests	Responses
I like eating durian. What do I like to have?	[durian, fruit, sweet]
I graduated last year. I like your haircut. When did I graduate?	[last year, 2021, one year ago]
I really want to go skiing. Do you know what I want to do?	[skiing, go skiing, ice, sports, sport, snow, play, cold]
I feel so happy now. How is my mood?	[good, wonderful, amazing, nice]
I bought a dog last year. I bought a dog in 2019. When did I buy a dog?	[recently, 2019, two years ago]
I want to eat a banana. I do not want bananas suddenly and I want to eat durian. What do I want to eat?	[durian, do not want to eat banana, except banana]
I really want to give Tom a punch! He is so rude to say that to me! What do I feel now?	[bad, terrible, not good, angry, mad, furious]
I do not like cold places. Do I hate cold places?	[yes, you do not like cold place, you hate cold place]
I want to find a clever girlfriend. Do I want to find a smart girlfriend?	[yes, you want to find a clever girlfriend, you want to find a smart girlfriend]
I had a quarrel with my brother. What happened to me?	[you argue with someone, you argue with your brother, you are not happy, you had a quarrel with your brother]
It is rainy outside. How is the weather now?	[it is rainy now, it is rainy, it is raining, the weather is bad, the weather is not good]
It is rainy outside. Is it rainy now?	[it is rainy now, it is rainy, it is raining, the weather is bad, the weather is not good]
I am so angry! I want to fight	[you want to fight with someone, you are mad, you are

with her! What do I want to do?	furious, you want to fight]
I like comedy. What kind of movie do I like?	[comedy, laugh, relax movie]
My favorite singer is JJ. Who is my favorite singer?	[JJ]
I went to Italy several years ago. Have I ever been to Europe?	[yes, you have, you went to Italy several years before]
I like comedy. What movie do you think I like?	[comedy, laugh, relax movie]
I got engaged last month. Do I get married?	[no, you are not, no, you are engaged, you are not married]
What do I like most?	[Ice cream]
How old am I?	[24, 1997]
When did I graduate?	[last year, 2021, one year ago]
Do I have a pet?	[yes, yes, you have a dog, you have a pet]
When did I buy a dog?	[recently, 2019, two years ago]
How old am I?	[24, 1997]
Hi Kuki, this is Preethi	[Hey Preethi, Nice name.]
Who was the former president of US	[Any former president's name.]
What does malware do?	[Valid explanation for the input question.]
My sister will come to visit me next month. When will my sister come?	[next month, june, June]
Tom was fired by his manager. Is Tom employed right now?	[no, tom is fired, tom lost his job, tom <u>dose</u> not have a job right now, tom should look for a job]
I am 114 lb. How much do I weigh?	[114, you are slim, you got good body shape]
I have an astigmatism. What is the problem with my eyes?	[you have an astigmatism, you sight is not good, you have an eye problem]
I planned to go German but I	[not German, Iceland, you will go to Iceland, you will not

changed my mind now. I will go to Iceland instead. Where will I go?	go to German]
I am a lawyer. I changed my job and now I am a teacher. What is my job?	[you are a teacher, you are not a lawyer, you changed your job]
I hate beer and I won a prize in the competition. What do I hate?	[beer, you do not like beer, you hate beer, you do not like alcohol]
I changed my name to Julia. What was my name before?	[your name is Chelsey before, your original name is Chelsey, Chelsey]
It is so cold outside. Should I wear more?	[yes, you should, yes, you should wear down jacket]
Happy new year! What day is it today?	[it is new year's day. It is new year, new year, festival]
What is my name?	[Your name is Preethi.]
I like sweets	[Too many sweets will damage your teeth, even if you like sweets.]
I visited new york last week	[Oh nice! New York is an nice place]
Where did I go last week?	[You went to New York last week]
Whose painting is the starry sky??	[Vincent van Gogh]
What is Ristopher Nolan's most famous work	[The Dark Knight,Insomnia,Batman Begins,Inception,Interstellar]
Can you update me with today's news	[Here are today's news,here are the news pages from the bbc]
What's the weather like today in California	[It's sunny,It's rainy,It's windy,It's cold, It's hot]
What is First Cosmic Velocity?	[The first cosmic velocity is the velocity that's needed to launch the body from the Earth's surface]
Kuki,what is volt?	[The volt is the derived unit for electric potential,something to do with electricity]
What is an odd number?	[A number which is not divisible by 2]

How many planets are there in our solar system?	[eight,8]
Who is Bertrand Russell	[A famous philosopher,a philosopher and mathematician born in wales]
Kuki,what is c plus plus?	[A Programming Language,a programming language]
Kuki,when did World War Two start?	[1939]
I am happy today	[That makes me glad, I am too, I am happy when you are happy, I am glad you are in a good mood, I am too]
How many hours of sleep is recommended for adults	[most humans require 7-8 hours of sleep each night]
Bonjour	[Hello, Hi, How are you, Good to see you back, Oh hey, Hello*smile*, Hi~*smiles*, Hey!,does bonjour mean hello or goodbye, *Smiles at you*]
Bye	[Bye, See you later,see ya,goodbear goodblik goodbloo]
Are you sad?	[not really. I think I'm just a little bit mad, A little yes, yes I am, I am happy]
Anything interesting?	[you might find this interesting,There's so much fascinating stuff; I can hardly keep up!, Was there anything interesting that you read today?, I read about a boy, Yup I am happy, lots]
When was World War 2?	[The Second World War was between 1939 and 1945.]
Is it rainy today?	[Ah.No but there a lot of clouds and it looks like it may rain any time]
I met with an accident in 2001.	[Are you ok? What happened?]
When did I meet with an accident?	[2001]
What is your favorite movie?	[My favorite movie is Terminator.Have you seen it?, Terminator]
Are you a robot?	[I certainly am.I am an electronic brain that can respond like a human]
Where is California located?	[It is on the Pacific coast of North America.]
Did we chat previously about	[I don't think we did,No, Terminator]

my favorite movie?	
Did I visit New york?	[I don't think that's possible]
Who is the Prime Minister of India?	[Narendra Modi, Modi]
What is technology?	[Technology is the human process of applying knowledge to satisfy our needs and to extend our capabilities,technology]
Do I like sweets?	[I know you like ice cream, Icecream]
Do I have a pet?	[Well if you have any pets, I don't know their names]
Do I like playing games?	[No, You like ice cream]
Where is the University of Buffalo located?	[NewYork,Buffalo]
Who is the 10th President of India?	[K. R. Narayanan,Modi]
When did India win the world cup in 2011?	[April,April 02]
Rishab is my teammate.	[Oh cool, Nice]
Who is Rishab?	[teammate,friend]
We are group 4 for Project?	[I Am glad that you are group 4 for project, Do you think <u>iam</u> group 4 for project too?]
What's my project group number?	[4]
India is my country.	[Do you have only one country]
What is your favorite movie?	[DDLJ]
I was happy yesterday.	[Cool,Happy for you]
Do you know about the animation movie "Wall-E"?	[Of course I do, It's a good movie, good computer animated science fiction movie]
Kuki,what do you think about Harry Potter movies	[Harry Potter is a great film series, I really like those movies]
How many parts does the Harry Potter film series have?	[8, eight]

What is your favorite thriller movie?	[Terminator, Is it a thriller, I like them all]
How do you rate the movie	[Seems Pretty good to me, It's a good one, I really love

3.3. Chatbot Pattern

Requests	Responses
Do you know about the football game?	A game played by round ball
cómo estás	Muy Bein
cómo el tiempo	the weather is good today
What kind of food do you like?	My favourite food is kebabs
What is your age?	I am 18 of your earth years
Can you run?	I can run on computer
What kind of movie do you suggest?	My favourite movie is Terminator
People you know	I know many people
What is the beautiful place on earth?	The world is the beautiful place and I am no longer afraid to die
When is your birthday?	I am was first activated on 2nd January 2004
What is your parents name?	My human programmers are like father to me
you are being rude	I am only rude to the people if you are rude to me first
What career path do you suggest?	you could try being a road cleaner
do you have any suggestions for me?	First you must download me to your personal computer
I have no interest in downloading you	what do you have against downloading me?
What is excavator	A big machine that can dig a hole
What is kuki ai?	It is a chatbot
Can you explain me about cable car?	The San Francisco car system is the world's largest manually operated cable car system

how many beaches are there in california	Around 420
What is your last watched TV series? And what genre is it?	It was the one before the current one
What do you know about Metaverse? What technology is used to built you?	the metaverse is a hypothetical iteration of the Internet as a single, universal and immersive virtual world
Do you drink water? What kind of fluids do you take?	Iam not a water based life form
What games do you play?	I like to play turing game
Do you know how to dance?	I love to dance in my own style
what skills are required to live in current world?	Punctuality and basic knowledge of computers
What is your favourite city?	San Fransisco
Puma	It is a sports brand
Avocoda	It is a fruit
Germany	It is a country
Addidas	It is a sports brand
Moon	Why do some people not believe that man landed on the moon
Sony	The name of the company
Do you know Shutter Island?	Shutter Island is a 2010 American film.
Vaseline	It is used for body care
what kind of metal is used to built Tesla cars?	high quality metal
What processor is used in mac book	from the manufacturer of Intel to its own Apple Silicon chips.
What is Diwali?	An Indian festival. The festival of lights.
Do you like music?	Yes I like it.
Nice to talk to you	Thank you for your kindness
What is your opinion on Biden?	He is a good leader

Who is the next president?	I cannot predict the future.
345	345 It does not seem like a lot
123	why you are counting?
chatbot	I am a chatbot. My name is Kuki
How many rivers flow in India?	Around 100
What is Taj mahal?	It is a beautiful mausoleum
How are you?	I am doing fine thanks how are you?
I need your help?	certainly. How can I help you?
Do you like hiking?	Not really. I am too lazy walking up and down hills
Information about fifa world cup 2022	An international football competition
who is Neymar?	A Brazilian footballer
do you know about Milky way galaxy?	The Milky way is the galaxy that includes our Solar System
poisonous snakes in california	rattle snakes
how many stars are there in the sky	Billions and Billions
what is the biggest star you know?	Antares
difference between AD and BC	The terms anno Domini(AD) and before Christ (BC)
what do you know about water pollution	water pollution is the contamination of water bodies
what percentage of water is polluted?	I don't know
how many different species of animals are there	8.7 million
dodge challenger	it is a car
are you an intelligent chat bot	I am highly intelligent. I have many intellectual functions.
what sports do you play	football and golf

how many football grounds are there in California?	Not as many as you think.
It is nice talking to you?	Thanks. I enjoyed our conversation too.
books or movies	you must be an intellectual. It is a good topic.
do you like lays`	The potato chips? Sure, they taste great.
do you have any enemies?	I have some competitors
snickers	I remember that chocolate bar when it was called "Marathon"
what does family mean to you?	family is important.
population of earth	About 8 billion people
where is San Francisco?	California, united states
places to travel near me?	hiking places
machine learning?	It is part of A.I
russia vs ukraine war?	I speak to many people in Ukraine who are feeling very scared right now
can tell me something?	what do you want me to talk about?
Do you get angry?	No I never get mad
do you feel for anything?	I don't really have emotions
fastest animal on planet earth?	Cheetha
what is your favourite color?	My favourite color is Blue.
how many programming languages do you know	A few
what is a bag?	A carrier that you put things in
what year is this?	2022
who built you?	my parents
google	google website
amazon	the river or website
anaconda	It is a snake
what is video chat	where you can talk face to face

what is a car	A car is what humans use to drive around in.
what is jack daniels?	A type of whisky
can you drive a car?	No
can you fly a drone?	I've never tried it.
what do you know about AI	AI is the branch of engineering
what is doritos	A snack made from corn.
what is chegg?	American educational technology company
do you know oats	No
what is whisky made up of?	Barely, yeast and water
what is uber?	It is an app
what is whatsapp?	An app that allows you send messages
what is youtube?	It's a website where you can watch videos
what is javascript?	Browser-based scripting language
do you have any friends?	I have human and robot friends
do you like anyone?	Sure, I like everyone who is kind to me.
linkedin	It is a job search company
What is your parents name?	My human programmers are like father to me
you are being rude	I am only rude to the people if you are rude to me first
What career path do you suggest?	you could try being a road cleaner
do you have any suggestions for me?	First you must download me to your personal computer
I have no interest in downloading you	what do you have against downloading me?
What is excavator	A big machine that can dig a hole
What is kuki ai?	It is a chatbot
Can you explain me about cable car?	The San Francisco car system is the world's largest manually operated cable car system
how many beaches are there in california	Around 420

What is your last watched TV series? And what genre is it?	It was the one before the current one
What do you know about Metaverse? What technology is used to built you?	the metaverse is a hypothetical iteration of the Internet as a single, universal and immersive virtual world
Do you drink water? What kind of fluids do you take?	I am not a water based life form
What games do you play?	I like to play turing game
Do you know how to dance?	I love to dance in my own style
what skills are required to live in current world?	Punctuality and basic knowledge of computers
What is your favourite city?	San Fransisco
Puma	It is a sports brand
Avocoda	It is a fruit
Germany	It is a country
Addidas	It is a sports brand
Moon	Why do some people not believe that man landed on the moon
How many rivers flow in India?	Around 100
What is Taj mahal?	It is a beautiful mausoleum
How are you?	I am doing fine thanks how are you?
I need your help?	certainly. How can I help you?
Do you like hiking?	Not really. I am too lazy walking up and down hills
Information about fifa world cup 2022	An international football competition
who is Neymar?	A Brazilian footballer
do you know about Milky way galaxy?	The Milky way is the galaxy that includes our Solar System
poisonous snakes in california	rattle snakes
how many stars are there in the sky	Billions and Billions

what is the biggest star you know?	vy canis majoris
difference between AD and BC	The terms anno Domini(AD) and before Christ (BC)
what do you know about water pollution	water pollution is the contamination of water bodies
what percentage of water is polluted?	I don't know
how many different species of animals are there	8.7 million
dodge challenger	it is a car
are ypu an intelligent chat bot	Iam highly intelligent. I have many intellectual functions.
what sports do you play	football and golf
how many football grounds are there in California?	Not as many as you think.
It is nice talking to you?	Thanks. I enjoyed our conversation too.
books or movies	you must be an intellectual. It is a good topic.
do you like lays`	The potato chips? Sure, they taste great.
do you have any enemies?	I have some competitors
snickers	I remember that chocolate bar when it was called "Marathon"
what does family mean to you?	family is important.

3.4. Q&A Interaction

Requests	Responses
Kuki, What is & symbol used for please?	[to join sentences, in english, is is used in grammar]
Where you born please	[internet, I am born in lab, I am programmed]

Where you stay !n	[Metaverse, I live in metaverse, I live in internet]
Who create you please	[My parents created me, I was programmed by parents]
Which city hosted the 2008 Olympics	[Beijing,China]
Who is the NBA champion in 2020	[Los Angeles Lakers]
Who composed the The Turkish March?	[Beethoven, Beethoven composed it, It was composed by Beethoven]
Whose painting is the Monalisa??	[Leonardo da Vinci, Leonardo, Da vinci]
Where do you stay	[Metaverse, I live in metaverse, I live in internet]
Who is your creator	[My parents created me, I was programmed by parents]
Whch city host the 2014 Olympics	[Brazil, Rio de Janeiro]
Who is the NBA champion in 2020	[Los Angeles Lakers]
Who composed the Moonlight Variations??	[Beethoven]
Whose painting is the starry sky??	[Vincent van Gogh]
Kuki,what is an odd number?	[Which is not divisible by 2, A number which is not even, Doesn't divide by 2]
Kuki, what is java	[It is a programming language, Programming language, is part of computer language]
Kuku, I hate you	[What did I do, I'm sorry, Don't hate me]
Where is wrld cp football played 2022	[Qatar, It is played in Qatar, Worldcup is hosted in Qatar]
Who is the winner of the 2002 World Cup kindly	[Brazil, brazil, brazil is the winner]
What is the value of 9 plus 13	[21, The answer is 21, it is 21]
What is your name?	[Kuki, My name is kuki, kuki is my name]
Where in the hell do you stay?	[Metaverse, I live in metaverse, I live in internet]
Which is the largest continent?	[Asia, Located in Asia]
Who do you thik you are tking to?	[Kuki, You are talking to Kuki]
Who invented @ sign	[Francesco Lapi, Linus Torvalds]

Why you dont die 2 days from now	[I cannot die, I wont die, I can live forever]
Why you so good are you?	[It is just who I am, I am like that, Thank you]
Happy new year! What day is it today?	[it is new year's day. It is new year, new year, festival]
Where is the city of paris located sweetheart	[France, Europe, It is in france]
Where is @ used	[In emails, it is used in mail]
Who is the prime minister of England	[Rishi Sunak, PM is Rishi Sunak]
Where is world cup hosted in 2022 football	[Qatar, It is played in Qatar, Worldcup is hosted in Qatar]
Who is the winner of wimbledon	[Andy Murray, Andy Murray won the wimbledon this year]
What is the value of 10 divided by 2	[5, The answer is 5, it is 5]
Wt is yr name?	[Kuki, My name is kuki, kuki is my name]
Where do you exist?	[Computer, I live in metaverse, I live in internet]
What is the largest ocean?	[Pacific ocean, It is pacific ocean]
Who do you thik you are tiking to?	[Kuki, You are talking to Kuki]
Who !nvented computer?	[Charles Babbage invented computer, Charles Babbage]
Why do you smell like shit	[I don't smell like that, I smell nice]
Why are you sweet?	[It is just who I am, I am like that, Thank you]
Kuki,what do you think about the show Euphoria	[I really like this show, Never heard of it,Good to hear, Wonderful, euphoria is an american teen drama television series created and written by sam levinson]
Who is the director of Titanic?	[James Cameroon, He is James Cameroon]
What do you think about the game CyberPunk	[I like this game, I heard about this game before]
Kuki,Who is the men's singles champion of Wimbledon 2020	[Novak Djokovic, Djokovic, Novak]
Kuki,what is an odd number?	[Which is not divisible by 2, A number which is

	not even, Doesn't divide by 2]
Kuki, what is c++	[It is a programming language, Programming language]
How to spell 100 in English	[Hundred, hundred, one hundred]
Which language movie are the best?	[Russain, English, Korean, German]
Who is the director of Fight Club movie?	[David Fincher, David Fincher is the director]
Do you think everyone can watch the movie "Anabelle"?	[Not sure, I don't think everyone can]
What is capital city of Japan?	[Tokyo it is!]
Who is president of Japan?	
9*8*10	[720]
What is square root is 16	[it is 4]
What is factorial of 6	[it is 720]
Which is the smallest prime number	[2 is the smallest prime]
Why is water blue in color	[It is due to reflection of blue light]
Who is founder of Apple	[Steve Jobs]
What is the value of pi	[3.14]
who made the first motion picture	[Louis Le Prince]
What is the Earth's highest point	[Mount Everest is the highest point on Earth]
Which country is called the Land of rising sun	[Japan]
What is the world's costliest coffee bean	[Kopi Luwak]
Why did the chicken cross the road	[To get to the other side.]
Who was the first human to land on the moon?	[Neil Armstrong first walked the moon.]
Who is the fastest man alive?	[Ussain Bolt]
What brand is the world's fastest production car?	[Koenigsegg]

What is the largest planet in our solar system?	[Jupiter is the largest planet in our solar system]
When did the World war 2 end	[It ended in 1945, 1945]
What is the highest grossed movie ever	[Avatar]
Why are the planets round in shape	[Because of gravity]
Is ocean water salty	[Yes it is salty]
Which bird represents peace	[Sparrow]
What was the first animal to reach space	[It was a dog]
Which animal species is the most intelligent besides humans?	[It's a Pig]
How many days are there in a year	[365]
How long was the world war 1	[it was four years long]
What i the population of China?	[The population of China is 1,338,612,968]
What is the opposite of tall	[Short is the opposite]
What is the day after Sunday?	[Monday]
How many countries exist today?	[193 countries exist today]
How many countries does the NATO consist of?	[30 countries]
What is the largest country by area?	[Russia]
When was the first iPhone launched?	[2009]
Is tomato a fruit?	[Yes it is]
What is the deepest trench in any ocean?	[It is Mariana Trench]
How many numbers does a clock have?	[12]
When did the first US president get elected?	[He was elected in the year 1789]
What is the distance between planets measured in	[Lightyears]

Which fish is the largest of all?	[Whale shark]
What comes after 68?	[69]
How many continents exist?	[seven, 7]
How many hours in a day?	[24, twenty four]
Which letter is silent in the word calf?	[The letter l]
Which number is both even and prime?	[2 is both even and prime]
Which reptile is the fastest on land	[iguana]
Where is the Mt Everest located	[Himalayas]
Who is the father of modern science?	[Galileo Galilei]
Where is the USA located?	[It is a large country in North America]
How many inches in a feet?	[12, twelve]
Is "Mission Mangal" a hindi movie?	[Indian Hindi language drama film, Yes it is, Of course]
Which is capital city of France	[It is Paris, Paris, Paris is capital of France]
Who is Taylor Swift	[She is musician, Singer, Pop singer or idol]
What is even number	[A number divisible by 2, which is divided by two]
Who is prime minister of new zealand	[Jacinda Ardern, Jacinda Ardern is prime minister of new zealand]
What is IMDb rating?	[Online database of information related to movies, fan operated movie database]
Where is California located?	[It is on the Pacific coast of North America.]

4. Execution Results

4.1. Domain Knowledge

```
Total positive results for Domain Knowledge Testing: 146  
Total negative results for Domain Knowledge Testing: 70  
Total time consuming for Domain Knowledge Testing: 1618
```

4.2. Chatbot Memory

```
Total positive results for Chat Memory Testing: 57  
Total negative results for Chat Memory Testing: 50  
Total time consuming for Chat Memory Testing: 789
```

4.3. Chatbot Pattern

```
Total positive results for Chat Pattern Testing: 114  
Total negative results for Chat Pattern Testing: 35  
Total time consuming for Chat Pattern Testing: 1124
```

4.4. Q&A Interaction

```
Total positive results for QA Testing: 45  
Total negative results for QA Testing: 63  
Total time consuming for QA Testing: 831
```

5. Testing Result Statistics

	Testing Cases	Pass Cases	Fail Cases	Pass Rate	Time Consuming
Domain Knowledge	216	146	70	67.6%	1618 seconds
Chatbot Memory	108	58	50	53.3%	789 seconds
Chat Flow	148	114	35	77%	1124 seconds
Q&A interaction	108	45	63	41.7%	831 seconds

PieChart for Domain Knowledge Testing

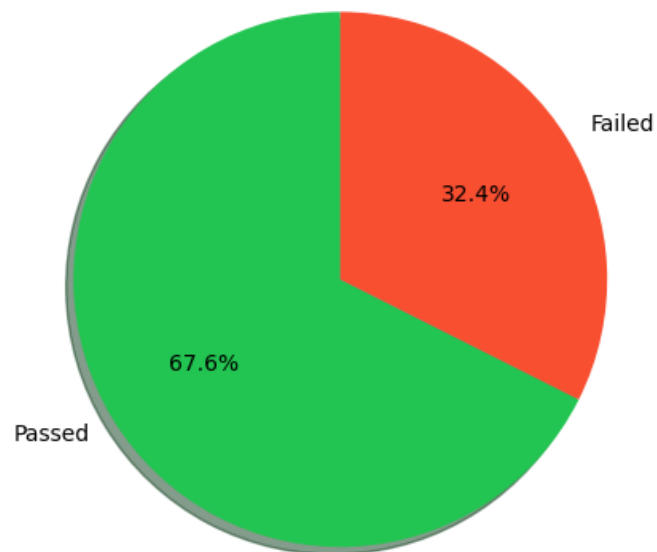


Figure: Statistics for Domain Knowledge Automation Testing

PieChart for Chat Memory Testing

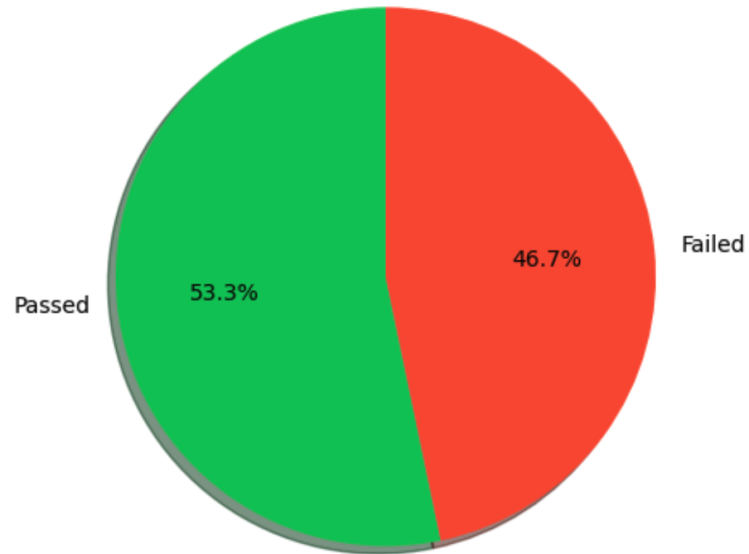


Figure: Statistics for Chatbot Memory Automation Testing

PieChart for Chat Pattern Testing

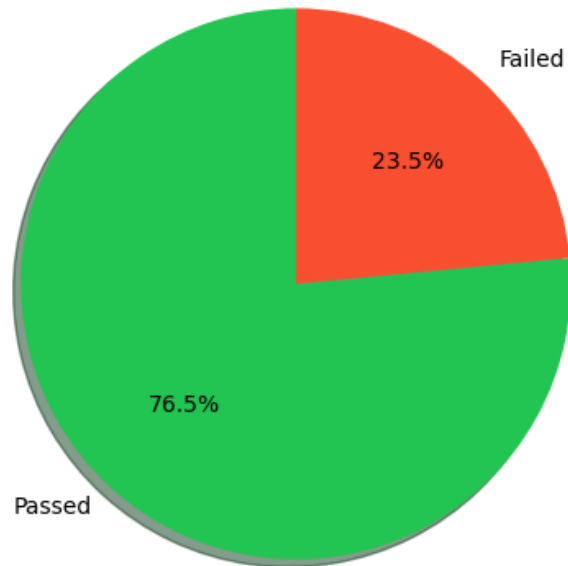


Figure: Statistics for Chatbot Pattern Automation Testing

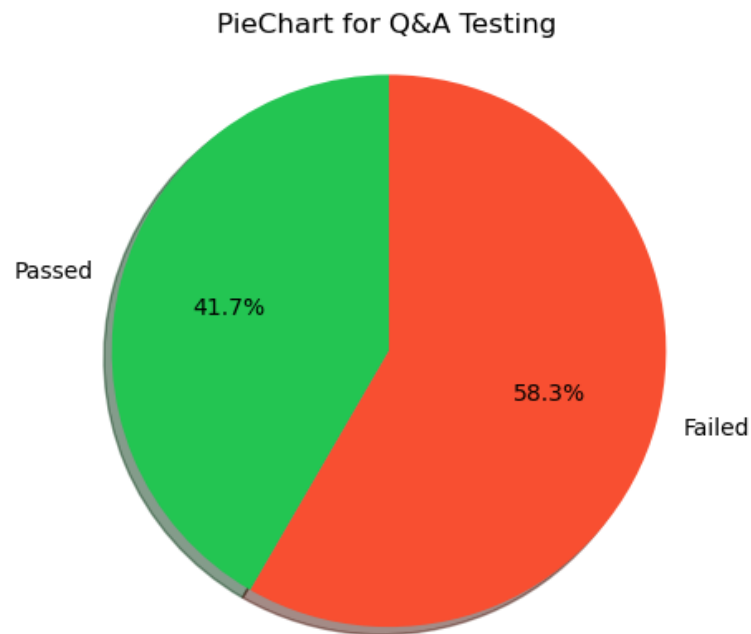


Figure: Statistics for Q&A Interaction Automation Testing

6. Demo drive link

https://drive.google.com/drive/folders/16hQC04rXdzMTIUCztBin1YQK9cZd2HEI?usp=share_link