Automated Testing of Ticket Booking ApplicationUsing Selenium and ML

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ABSTRACT

Tests are conducted to locate or detect device failures and defects. What test cases are only evaluated in automated testing. It's not just to test new connections or stuff but it can be appreciated from previous experiences that we are doing something new here to try and use the experience to get new results. The layout of a web scraper, computer training (ML), and selenium are three strata to accomplish this approach. It will be checked on the web page and trained on a framework based on a human understanding to understand what test cases should be followed for every single feature of the webpage and system next time on station, based on that info on the website, to conduct health tests and smoke tests intelligently. The system learns what to do with a web feature such as a button. The outputs that can be obtained even by classifying the form of output are error pages or are not intended for the page. This strategy allows thewider business organization, instead of carrying out human activities, to comply with an innovative challenge inresearch.

Keywords: Automated Testing, Selenium Web Driver, Machine Learning, Web Applications, Test Case.

I. INTRODUCTION

Tests are carried out to see how well an application performs. Time usage and human factor reduction by manual assessments are automated to prevent repetitive activities. It saves time and enhances research consistency. Automated tests are a way in software tests to track the execution of tests using software tooling and then compare actual test findings with planned or anticipated results. Organizations need intelligent research methods to speed up decision-making and better meet constantly evolving test challenges. Selenium is an automated open-source testing suite for various browsers and frameworks for Web applications. Selenium Webdriver is the most important part, a friendly API that facilitates read and maintain testing.

Today, also for the execution of the same test cases, each stage in automated testing should be precisely defined. We may use ML to resolve this restriction. It allows machines capable of learning without being programmed directly. The algorithm extends to new data until the training is complete. The website will be educated to a framework and it knows the test cases to be carried out with each feature of the website. After a certain point, the time system knows and checks any web feature with its features. Like bugs, weak queries, etc., should be included in the testscore.

Related Work:

- Instead of manual testing, recent developments launch automated testing. The test cases can be developed using natural language processing from functional requirements(NLP).

- Here the test case table is created automatically by saving effort and time usingkeywordsfrom the practical criteria text. By semantic web content mining, you can reduce the difference between user knowledge and computer-readable information.

- If program specifications are semi-formal or formal, the testers find it difficult to test the framework, and experts arerequired.

- Different test case priority approaches (TCP) may be used to identify vulnerabilities at the early stages. In each iteration, the Risk Technique (Risk) chooses the riskiest test scenario. The technique of diversity (Div) is to make test cases a priority by maximizing the distances from test cases already inspected. The DivRisk strategy is a mixture of DivRisk and Risk. The risk approach is seen to be more successful by APFD (Average Percentage of FaultDetected).

- The similarity of the sentence fragments can be determined using the edit distance model, instead of the conventional vector spacemodel.

- The editing interval between the two fragments corresponds to the operations needed to translate one fragment into another. The expense of transactions such as repair, insertion, and elimination was the resemblance of the fragment. Regression testing is the re-testing of applications expanded or updated with newfunctionality.

- The Rating Vector Support Machine (SVM RANK), can accommodate vectors of large sizes and returns test cases in class. For TCP, this is used. A framework for creating complex web application test cases. A web application will be evaluated and a page Flow Chart (PFG) will begenerated.

- To boost product consistency, minimum test cases must be chosen, covering all test functions. Test suite optimization is a TCP focused on requirements and vulnerability hybrid test caseminimization.

- A path with the greatest path complexity is most likely to exist and must first bechecked.

- Any automated testing problems arise, including more detail, an inconsistent acting level, several browsers that can view the same page and the page content can be varied during the test.

- Test automation makes it easier to log and update the benefits of reusable and testscripts.

- The use of a selenium web driver is very efficient, fast, and reliable for automated testing.

- As the selenium IDE is just a module for Firefox. IDE is an advanced programming environment. Selenium extreme (RC) is used to measure selenium RC. RC selenium is severe. Selenium grid is a node and hub concept used in parallel testing. Therefore, choosing the web driver selenium is safer than other tools. Selenium web driver is better than the Watirwebdriver by performance measuementtoo.

II.   PROPOSED WORK

A web-page assessment ranking in all site elements. Three of them were The layered structure is made up of a beautiful network ML to anticipate test cases and finally for each web feature In certain test cases, selenium.

Demands and nice availability:
Applications is a Python HTTP library[13]. Apache2 license. This application is used to submit a submission, Get content, work with response code, etc. Get content. Beautiful soup is a crummy python library of third parties Files to be removed in HTML and XML files[14]. Beautiful. Sup 4 operates better and faster with lxml and html5lib. We are

here We are here. You offer a URL and a lovely application For any web function soup, we can get info Identify and choose the test case.

Machine Learning (ML): ML is the most important intermediate layer for ML Test case prediction for each site feature as with Their kind.

Load and remove data setcharacteristics:

Data for train and test. A set of symbols is not feasible to be fed as they expect directly to algorithms Fixed format numeric function vectors. One of the world Count Vectorizer is the extractor of functions, Dictionary, and a document-period return matrix. matrix. Tf-idf (Repository word frequency times) The other kind which decreases the frequency) transformer The more general term weight-age above all records.

ML algorithms running and modelselection:

Naive Multinomial Bayes [15] estimates an individual's conditional chance Word assigned class. The word is given class. Vector machines in service (SVM) The algorithm benefits from the labeled training data Optimal hyper-flat categorizing new cases. Seeking the right grid scan cross parameters Form of authentication. Choose best by shifting model Similar methods of assessment.

Precision: Accuracy rate measures the number of times It's the classifier correct. If the whole package Strictly matching expected sample labels The real set of stickers, so precision is 1 other, 0. If the value for the sample is the expected one and A percentage of the real value Calculation of correct predictions on n samples Just as in Equation1.

$$Ac(y, y^\wedge) = \frac{1}{n} \sum_{i=0}^{n-1} 1(y^\wedge = yi)$$

Matrix of confusion: a table illustrating the Classification model efficiency. It's real. Hit: Optimistic tuples which have been The classifier has positive marks. It's real. Negative (TN): negative Right rejection tuples that have been adversely marked classifying. classifying. Fake Beneficial Warning (FP): Negative tuples that have been defined as positive. Positive tuples False Negatives (FN) or fail And have been branded derogatory. Its uncertainty matrix is seenin multi-classification Table I. How uncertainty is measured Equation 2 shows items for each class To five. Tofive.

	Classified			
Actual	C11			C1n
	Cn1			cnn

TP: The principal value of the diagonal. tei= cii

FP: This is the sum of all values that fit Except the class struck column.

fei= ΣCSi − tei

FN: the sum of all the respective values Row except the class struck.

fni=ΣCiS−tei

TN:AlluncertaintymatrixvaluesaresummarizedExceptfortherowandcolumnofthatclass. tni=ΣΣCSk−tei−fei−fni

b) Study on classification: Summary text of principal Metrics of classification, such as accuracy[16], note, F1 score for each grade. It's 1 at best. The worst of all is 0. The capacity to reliably not a positive sample for the classifier This is bad. This is negative.
TP

$Precision =$

$Recall =$

$\overline{TP + F\!P}$TP

$TP + FN$

Note, the classifier will find anything the samples positive

F1 score is an average weighted reminder and Accuracy of equal meaning.
Precision * Recall

$F1\ score = 2 *$

$\overline{\text{Precision} + \text{Recall}}$

Category Mark Prediction: Based on the best model Test scenario prediction and behavior selection accordingly Case forresearch.

WebdriverofSelenium
A Mobile application testing tool [17] is used to automate Check it's working as planned

III.IMPLEMENTATION

Web components that use requests and lovelySuffering:
The site elements must be derived from the requested URL. Second. First. We use requests to access all the answers web page details Object. Object. Object. Then, lovely soup 4 is used to evaluate a variety of web HTML-based sites with lxml. After that, all was extracted The requested URL includes input, img, a, pick, and button marks. We identify the site according to the form in the tag
Test Cases Prediction UsageML:
For each web element, the test case can be predicted in the requested URL. The data.csv file first loads train as seen in Fig. 3 which covers 3 Five fields: name of the tag, form, website, test case, and operation. The tag name, form, and site feature are characteristics. The class name is the evaluation case. Extraction by count Vectorizer following this function.
And the transformer of tf-idf. Then the model with SVM is fitted and found Using Gridsearchcv to output the best parameters. Loading of data for research. file and fitting model test that forecasts each test case Web element. - Web element. This process will output a data.csv class mark file In the photo. Four for the case and action of the exam.

	A	B	C	D	E	F
1		tag_name	type	web_element	test_case	action
2	0	input	text	textbox	Is text box is editable or not	editable
3	1	input	username	textbox	Is text box is editable or not	editable
4	2	input	password	textbox	Is text box is editable or not	editable
5	3	input	submit	button	Whether the textbox is taking values and button clickable	login
6	4	input	radio	radiobutton	Is radio button is clickable	radio
7	5	a	internal	link	Check link is working in website	working
8	6	img	no	image	Whether the image is displayed or not	display
9	7	select	text	dropdownmenu	Clicking item loads appropriate content	content
10	8	input	checkbox	checkbox	Whether the checkbox is selectable or not	selection

Conduct tests using WebdriverSelenium:
Checking of the test case (TC) of any site feature Applied for URL. Web feature to be placed at the requested URL Using a test data.csv file id or class names. Then it is over The online engine of selenium automatic testing. And save it eventually

	A	B
1	action	test_case
2	editable	Is text box is editable or not
3	editable	Is text box is editable or not
4	editable	Is text box is editable or not
5	editable	Is text box is editable or not
6	editable	Is text box is editable or not
7	editable	Is text box is editable or not
8	hidden	Check whether hidden field is not shown to a user
9	search	Can take value from search area
10	login	Whether the textbox is taking values and button clickable

Test case findings as pass or loss with test summary File result.csv.

TC1. The text box can be edited or not: Text box. It's for use to Specify the text box and attempt to send text keys.

TC2: If the text box takes the values and press log in on the button, clickable. Client name and identification Text box password and attempt to submit the values key And just remember to press the button login.

TC3. If you can press on the radio button: button Radio. You have to validate If it can be found, turned on, and clicked on.

TC4. On the website, search the address: Link. Ask for the connection And the status code returns. Usage status of HTTP reply File code.csv as seen in Fig. 5 mistake and not error rating 5

Link

TC5. Whether or not the image is shown: photo. Check Image status code and if an image is observed Loading or not. Loading or not.

TC6. Loads the proper contents by clicking on the item: menu. menu. Can all choice values be activated and sent.

TC7. Pick or not the check box: check box. Check box. See if it is enabled and can be pressed.

TC8. Can take search area value: press for search. To starting with, Follow the search box and try submitting keys. That can be accompanied by We press the button Check and generate a response search.

TC9. Is control value different from min to max: Scan. Can send keys with some value and are enabled? To max from min.

TC 10. Click on the button: Warning. Wait for an answer Select and we can monitor the alarm box after button.

TC11. If the input is reset as the original value: Reset Button. Button. Button. May we reset the text box by submitting the values Click the button Reset. Compare the previous value And the restore button after pressing.

TC12. The input is the chosen color: Color picker. Website is web The control system will transfer color to see if color is shown Picker on paint.

TC 13. Verify if a user is not shown in the secret field: Text box is hidden. Can it send and activate keys? The text box is hidden.

TC14. The expected file can be uploaded: Upload command. It downloaded the Activated button and can take the type-specified file. We have a test result.csv file as seen in a total ofthree layers.

In the photo. 6. There are four places there. Includes Tag name and id

Web element identifier. Web element identifier. The definition contains facts Test case like what fault execution. Specifies the status variable

Whether or not the test case has been passed.

	A	B	C	D	E
1		tag_name	id	description	status
2	0	input	username	Text box is enabled	pass
3	1	input	pass	Text box is enabled	pass
4	2	input	noteditable	Text box is not enabled	fail
5	3	input	fname	Text box is enabled	pass
6	4	input	lname	Text box is enabled	pass
7	5	input	mail	Text box is enabled	pass
8	6	input	hidden	Text box is hidden	pass
9	7	input	searcharea	search is working	pass
10	8	input	submit	login functionality is working	pass

For relation testing inparticular

When clicking on a page, TC for link checks ensures the user The desired page is answered. Identifies the evaluation protocol Request the relevant response to the test link and test link. It manages HTTP, link, time-out, and question errors Exception. Exception. As in Fig, the output of the test connection results.csv file. 7 Contains 5 areas, test objects, and link test URLs HTTP, HTTP, and HTTP are introduced and Status. - Status. For error relation, the status is shown as Failed and it shows pass with no error connection.

	A	B	C	D	E	F
1		Test_Item	URL	HTTP_ Response	HTTP_Infor mation	Status
2	0	link 1	https://www.w3schools.com/htmlooo/	404	Not Found	Fail
3	1	link 2	https://beacon.krxd.net/usermatch.gif?partner=mediamath&mmuuid=acdd5a68-13e5-4800-8999-378c777c4a14	204	No Content	Pass
4	2	link 3	http://www.io.com/	403	Forbidden	Fail
5	3	link 4	http://www.webconfs.com/http-header-check.php	503	Service Unavailable	Fail
6	4	link 5	https://www.zyxware.com/	200	OK	Pass
7	5	link 6	https://notifications.google.com/_/NotificationsOgbUi/cspreport	405	Method Not Allowed	Fail

Search button checking in particular

Finding the appropriate results page by the amount of the search question on the eCommerce website. Check Test Case Find page importance to search button features Search bar question. The test procedure is described to Recover all search results, search bar, and submit the query. As in Equation 9, the page significance score is found. We're here to Receive the result.txt file search query, as in Fig. 8.

IV. RESULTANALYSIS

Model ofClassification

By comparing accuracy, training period, and forecast time for various models you can select a classification model Function extractor combination with templates. In the following table: Features are depicted in the lines, and model column. You should locate it The best model is to remove characteristics with vectorizer counts and Transformer tf-idf with best settings accompanied by SVM. There was a mistake (kernel: linear, gamma: 0.01, C: 10).

Accuracy				
Features Model	CV	CV & TFIDF	Ngram CV	Ngram CV & TFIDF
NB	0.527777777778	0.222222222222	0.916666666667	0.222222222222
Linear SVM	1	0.916666666667	1	0.944444444444
SVM with best parameters	1	1	1	1
Training time				
Features Model	CV	CV & TFIDF	Ngram CV	Ngram CV & TFIDF
NB	0.00240802764893 s	0.00182700157166 s	0.00185608863831 s	0.00224018096924 s
Linear SVM	0.00304198265076 s	0.00554895401001 s	0.00276088746 s	0.00317978858948 s
SVM with best parameters	0.0591900348663 s	0.0528879165649 s	0.0554161071777 s	0.0541019439697 s
Prediction Time				
Features Model	CV	CV & TFIDF	Ngram CV	Ngram CV & TFIDF
NB	0.000618934631348 s	0.000553005264282 s	0.000639064407349 s	0.000690093704222 56 s
Linear SVM	0.00116109848022 s	0.00158405903955 s	0.00158405319955 s	0.000871181488037 s
SVM with best parameters	0.000890016555786 s	0.000591995331909 s	0.00111198425293 s	0.000615119934082 s

Metrics ofmeasurement

Various appraisal measures such as precision, rating SVM report, and uncertainty matrix with tf- idf above In Fig is shown in the Count Vectorizer (CV). 9 And all is best Outcome 1. Thismodel thus makes detailed forecasts over and above Additional versions. Following online research, we get reports Pie chart shape and barchart.

Study of WebTest

Pie diagram shows the exactness of the test cases The first a] figure in the figure passed and failed. Ten. For the details Which contain 72.2% passed and 27.8% missed test cases.


Test Cases Pass vs Fail
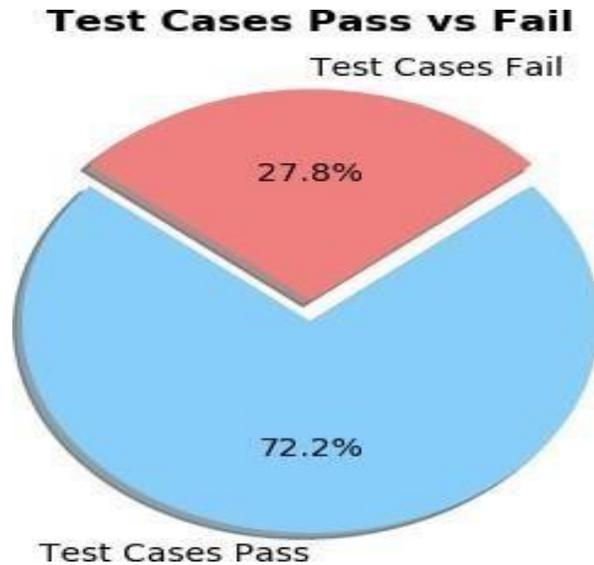
Boxes. As in Fig, bar map. 11 indicates the pass and fail in any test case Count. Count. Count. Each test case is defined by the X-axis and the Y-axis Count. Count. Count. Here we can see that TC7 has six test cases in total. TC7 is the check box test case. In the 4 is the number of passes 2 fails, giving 4 checkboxes operating perfect, but 2 fails. Another 2 checkbox doesn't fit right.

With this bar map, In particular, we should state which test case is passed or failed And it counts, too.


Link test pass vs fail
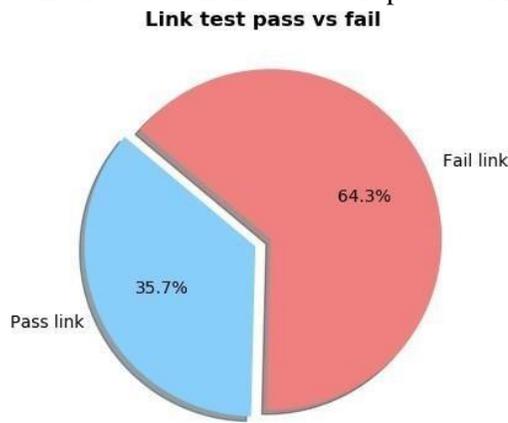
Study ConnectionTest

We have a pie diagram in the second [b] figure after the relation test The photo. Ten. The pass connection is 35.7% and the remaining 64.3%. Plays fail the connection. Shows a fail link. The relation test bar chart appears in the diagram. 12. The HTTP response status code is different on the X-axis. Y-axis is the number of connections. There are 3 ties, for instance With an error-free answer code of 200. Three of them. The 404 response code links are an error link. error.
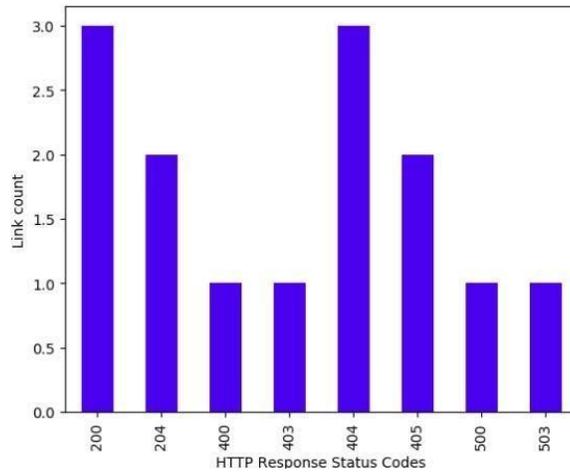
Find Test ButtonReview:

We got a bar graph like in Fig after the search button test. 13. The X-axis displays every question in the query document. Y-axis is the y-axis. The whole question bar represents the product of the complete quest and bottom stack Matched happening. Matched happening. If a question only has 1 hue, that means the flip-Kart web page significance of this question is 100%. Here are the following: bottle and oven have the significance of 100% website Worse Screwdriver Package Page Significance.
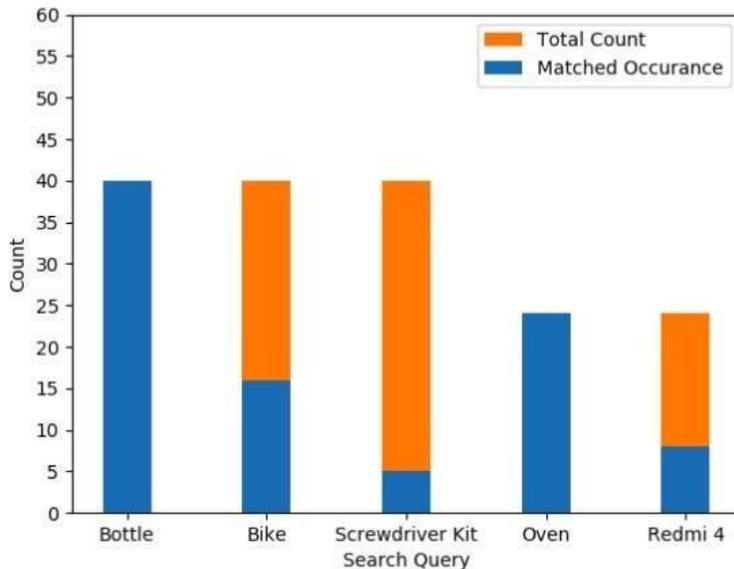
V. CONCLUSION

Which test route only the tester reveals in automatic testing Checked. - Tested. A new relation or feature will not be checked. If this is the case All is different from previous encounters it can appreciate And experience should be used to produce new outcomes. The recommendation System demonstrates that automated testing can be developed with ML's teamwork. This saves time and effort by hand. To a considerable degree. The best model for selecting the exam SVM with tf-idf on the top of the count is the case for any web feature A spark plug. The device will assess a feature Visual effects website which can produce detailed interactive details Fewer time outcomes. Results. We will build an application in the future The test results of all site research and given URL Web components or basic testing of each web form part. element. More reference cases representing various categories can be included in the Strategy for research.

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