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Project Testing

Journal Hub, Research Publication Website

Case Study – Journal Hub, Publication Website

Journal Hub is a Research Publication Management website which helps in automating the task of receiving the user's(author) work and publishing the same by the approval of reviewers and editors. Journal Publication website has expanded rapidly over the past five years and is predicted to continue at this rate, or even accelerate.The main objective of this project is to formulate the user's work into research paper for publication.

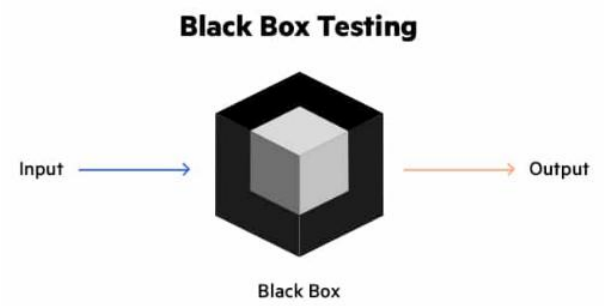
This system is used to ease the user's difficulties on publishing his/her research paper and helping them throughout the process , which makes it a go-to place for all types of people. Article options - Research Paper, Short Communication, Review Article & more.

Types of Testing

Software testing is of 2 types namely,

1. Black box Testing
2. White Box Testing

Black Box Testing - Types and Techniques



- It is a Software Testing method that analyses the functionality of a software or application without knowing much about the internal structure/design of the item that is being tested and compares the input value with the output value.

- This testing occurs throughout the software development and Testing Life Cycle i.e in Unit, Integration, System, Acceptance, and Regression Testing stages.

- Majority of the applications are tested by Black Box method.

TYPES OF BWT

Functional Testing

Deals with the functional requirements or specifications of an application.

Main Types :

- Smoke Testing
- Sanity Testing
- System Testing
- Integration Testing
- Regression Testing
- User Acceptance Testing

Non-Functional Testing

Deals with the non-functional aspects that are required to be tested to improve the quality and performance of the application.

Main Types :

- Load Testing
- Performance Testing
- Compatibility Testing
- Usability Testing
- Scalability Testing
- Stress Testing

Regression Testing

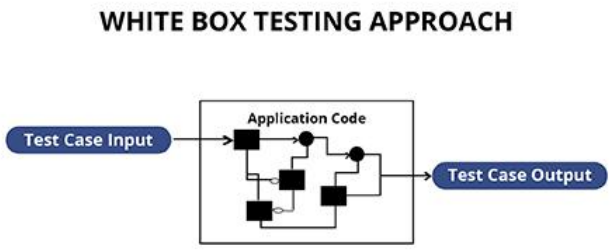
Regression Testing is done after code fixes, upgrades or any other system maintenance to check the new code has not affected the existing code.

TECHNIQUES OF BBT

- It is necessary to design test cases in order to systematically test a set of functions.
- Different Black Box Testing Techniques are,

- Boundary Value Analysis
- Equivalence Partitioning
- Decision Table Testing
- State Transition Testing
- Experience-Based Testing
- Requirements-Based Testing
- Graph-Based Testing
- Comparison Testing

White Box Testing



- White box testing techniques analyse the internal structures the used data structures, internal design, code structure and the working of the software rather than just the functionality as in black box testing.
- It is also called glass box testing or clear box testing or structural testing.

WBT is used to ensure that :

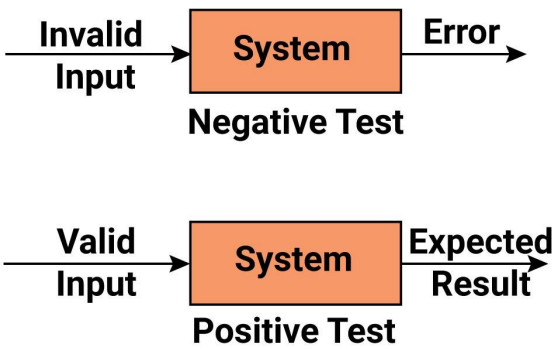
- That all independent paths within a module have been exercised at least once.
- All logical decisions verified on their true and false values.
- All loops executed at their boundaries and within their operational bounds internal data structures validity.

TECHNIQUES OF WBT

- Different White Box Testing Techniques are,
  - Statement Coverage
  - Branch Coverage
  - Compound Condition Coverage
  - Path Coverage

Positive Testing

- Positive Testing is a type of testing which is performed on a software application by providing the valid data sets as an input.
- It checks whether the software application behaves as expected with positive inputs or not. Positive testing is performed in order to check whether the software application does exactly what it is expected to do.

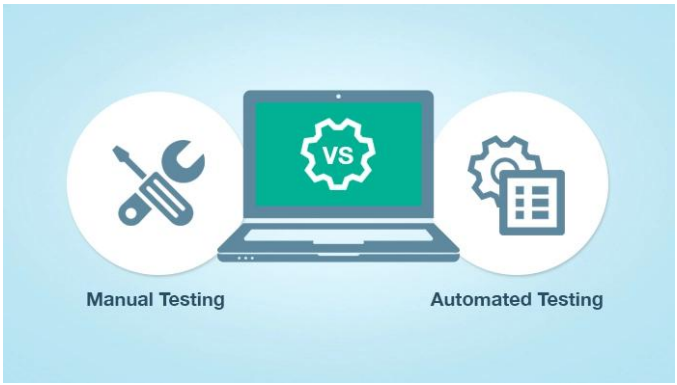


Negative Testing

- Negative Testing is a testing method performed on the software application by providing invalid or improper data sets as input.
- It checks whether the software application behaves as expected with the negative or unwanted user inputs.
- The purpose of negative testing is to ensure that the software application does not crash and remains stable with invalid data inputs.

Manual Testing

- Manual testing includes testing a software manually, i.e., without using any automated tool or any script.
- In this type, the tester takes over the role of an end-user and tests the software to identify any unexpected behaviour or bug.
- There are different stages for manual testing such as unit testing, integration testing, system testing, and user acceptance testing.



Automation Testing

- Automation testing, which is also known as Test Automation, is when the tester writes scripts and uses another software to test the product.
- This process involves automation of a manual process. Automation Testing is used to re-run the test scenarios that were performed manually, quickly, and repeatedly.

TESTING

Module -1 : **Registration**

1.) **Username** :

The positive Test Scenarios are,

- *Username box should not accept less than 8 characters.*
- *Username box should be up to 12 characters.*
- *Username box should accept only alphanumerics.*

The negative Test Scenarios are,

- *Username box should not accept more than 8 characters.*
- *Username box should not exceed 12 characters.*
- *Username box should not accept special characters.*

This test case can be handled effectively using Equivalence Partitioning (TEST CASES GENERATION).

- ✓ *Two test cases are considered to be equivalent if we expect the program to process them both in the same way.*
- ✓ *Input values to the system or application are divided into different classes or groups based on its similarity in the outcome.*
- ✓ *This technique is also known as Equivalence Class Partitioning (ECP).*

Thus, 3 invalid classes will be:

a) *Number of characters Less than or equal to 7.*
b) *Number of characters Greater than or equal to 12.*
c) *Characters other than alphanumerics like "#","!",";",etc.*

One valid class will be,

Character length >= 8 and =< 12 and consists of only alphanumerics.

We have thus reduced the test cases to only 4 test cases based on the formed classes thereby covering all the possibilities. So, testing with anyone value from each set of the class is sufficient to test the above test case objective.

SNO	TEST CASE OBJECTIVE	PRE CONDITION	STEPS / TEST DATA	EXPECTED RESULT	POST CONDITION	CONDITION PASS/FAIL
1	Username	Character length >= 8 and =< 12 and consists of only alphanumerics.	girish13	Username is Valid (Positive Test Case)	Any string with length >=8 and <=12 and only alphanumerics is correct. So, log in is permitted.	PASS
			giri!1	Username is Invalid (Negative Test Case)	Any string with length <=8 is incorrect. So, log in is not permitted.	PASS
			girishsudhakar$12	Username is Invalid (Negative Test Case)	Any string with length >=12 is incorrect. So, log in is not permitted.	PASS
			giri#12%	Username is Invalid (Negative Test Case)	Any string other than alphanumerics is incorrect. So, log in is not permitted.	PASS

2.) **Password** :

The positive Test Scenarios are,

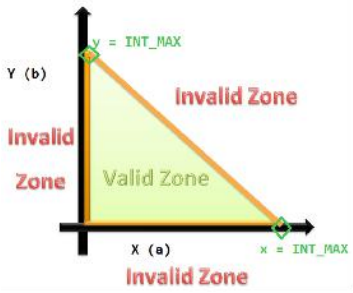
- *Password box should not accept less than 8 characters.*
- *Password box should be up to 15 characters.*
- *Password box should accept special characters up to 2-10 character length.*

The negative Test Scenarios are,

- *Password box should not accept more than 8 characters.*
- *Password box should not exceed 15 characters.*
- *Password box should not accept special characters.*

This test case can be handled effectively using Equivalence Partitioning and Boundary Value Analysis.

- ✓ *In this technique we focus on the values at boundaries since many applications have a high amount of issues on the boundaries.*
- ✓ *Boundaries are the values near the limit where the behaviour of the system changes.*
- ✓ *Here, both the valid inputs and invalid inputs are being tested to verify the issues.*



Thus, the boundary condition is Number of Character = [8, 15] and,

2 invalid classes will be:

a) Number of characters Less than or equal to 7.
b) Number of characters Greater than or equal to 15.

1 valid class will be,

Character length >= 8 and =< 15.

We have thus reduced the test cases to only 3 test cases based on the formed classes thereby covering all the possibilities. So, testing with anyone value from each set of the class is sufficient to test the above test case objective.

SNO	TEST CASE OBJECTIVE	PRE CONDITION	STEPS / TEST DATA	EXPECTED RESULT	POST CONDITION	CONDITION PASS/FAIL
2	Password	Character length >= 8 and =< 15.	girish13	Password is Valid (Positive Test Case)	Any string with length >=8 and <=12 is correct. So, log in is permitted.	PASS
			giri!1	Password is Invalid (Negative Test Case)	Any string with length <=8 is incorrect. So, log in is not permitted.	PASS
			girishsudhakar$12	Password is Invalid (Negative Test Case)	Any string with length >=15 is incorrect. So, log in is not permitted.	PASS

3.) **E-mail** :

The positive Test Scenarios are,

- *E-mail box should not accept less than 8 characters.*
- *E-mail box should be up to 12 characters.*
- *E-mail box should accept only alphanumerics.*

The negative Test Scenarios are,

- *E-mail box should not accept more than 8 characters.*
- *E-mail box should not exceed 12 characters.*
- *E-mail box should not accept special characters.*

This test case can be handled effectively using Equivalence Partitioning (TEST CASES GENERATION).

Thus, 2 invalid classes will be:

a) *Number of characters Less than or equal to 7.*
b) *Number of characters Greater than or equal to 12.*

One valid class will be,

Character length >= 8 and =< 12 and consists of only alphanumerics.

We have thus reduced the test cases to only 3 test cases based on the formed classes thereby covering all the possibilities.
So, testing with anyone value from each set of the class is sufficient to test the above test case objective.

SNO	TEST CASE OBJECTIVE	PRE CONDITION	STEPS / TEST DATA	POST CONDITION	EXPECTED RESULT	CONDITION PASS/FAIL
3	E-mail	Any string with characters before and after '@'.	girish@13	E-mail is Valid (Positive Test Case)	Any string with characters before and after '@' is correct. So, log in is permitted.	PASS
			@giri!1	E-mail is Invalid (Negative Test Case)	Any string with only characters before @ is incorrect. So, log in is permitted.	PASS
			girisudhakar$12@	E-mail is Invalid (Negative Test Case)	Any string with only characters after @ is incorrect. So, log in is permitted.	PASS

4.) **Forgot Password** :

This test case can tested using White Box Testing since, we need to extract email of the user from the database in order to validate the user's details.

This can be done by using Automated type testing.
Automation Testing is used to re-run the test scenarios that were performed manually, quickly, and repeatedly.

Thus it is required,

1. To check whether when we select the forgot password link it is directing to forgot password link page.

2. To check whether the link has sent to the mail to which the user has provided.

3. To check whether the answer given by the user at that time and he has given while at the time of registering must be the same .

4. To check whether the link can be used only once.

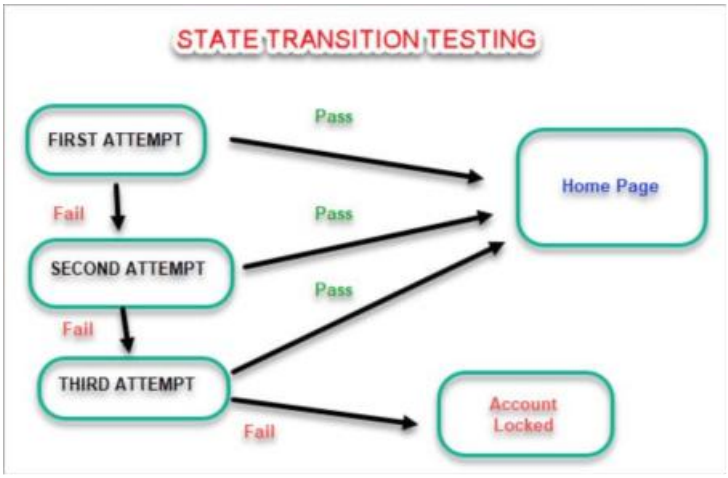
SNO	TEST CASE OBJECTIVE	PRE CONDITION	STEPS / TEST DATA	EXPECTED RESULT	POST CONDITION	CONDITION PASS/FAIL
4	E-mail	Character length >= 8 and =< 12 and consists of only alphanumerics.	If field in the form is empty.	Alert the user to enter the fields and then proceed.	Stay in same page.	PASS
			If the Email id does not match.	Alert user that "Email id Not match"	Stay in same page.	PASS
			If the Email id is Matched.	Extract it from the DB Table. Send a mail to user and Alert the user "Mail Has sent".	Redirect to 'Change Password' page	PASS

5.) **Maximum Attempts :**

This test case can be tested using Black-BoxTesting, since we need to test under different systems.

This can be done by using State Transition testing.

- *State Transition Testing is a technique that is used to test the different states of the system under test.*
- *The state of the system changes depending upon the conditions or events.*
- *According to those conditions, certain events are triggered.*



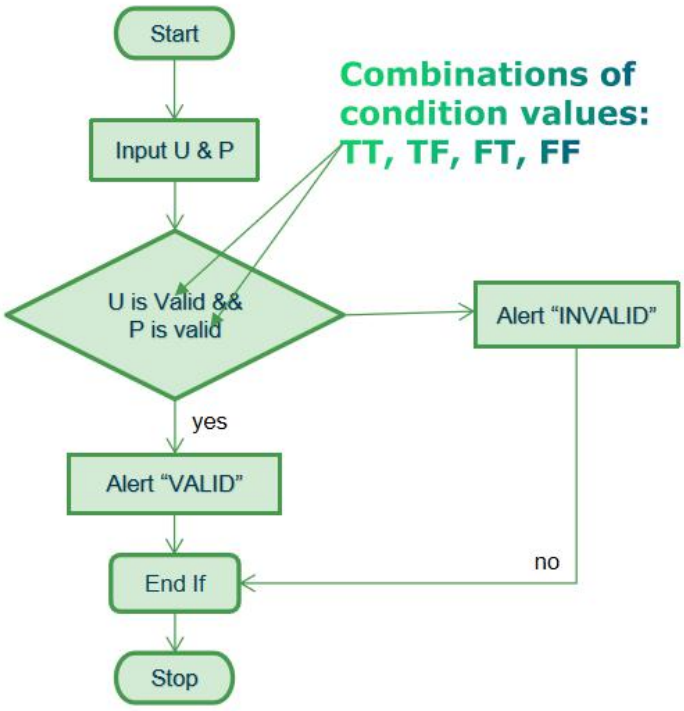
SNO	TEST CASE OBJECTIVE	PRE CONDITION	STEPS / TEST DATA	EXPECTED RESULT	POST CONDITION	CONDITION PASS/FAIL
5	Username and Password	**Username** : Character length >= 8 and =< 12 and consists of only alphanumerics. **Password** : Character length >= 8 and =< 15	If credentials after valid at 1st Attempt	Alert the user "Credentials are valid"	Redirect to "Home Page"	PASS
			If credentials after invalid at 1st Attempt	Alert the user "Invalid credentials. 2 Attempts left"	Stay in same page.	PASS
			If credentials after valid at 2nd Attempt	Alert the user "Credentials are valid"	Redirect to "Home Page"	PASS
			If credentials after invalid at 2nd Attempt	Alert the user "Invalid credentials. 1 Attempt left"	Stay in same page.	PASS
			If credentials after valid at 3rd Attempt	Alert the user "Credentials are valid"	Redirect to "Home Page"	PASS
			If credentials after invalid at 3rd Attempt	Alert the user "Invalid credentials. Account is locked for 24 hours."	Stay in same page.	PASS

6.) **Old user Verification** :

If the user is not active for more than 15 days, he must log in with his credentials.

This test case can tested using White Box Testing (Compound Condition Coverage) since, we need to verify both username and password.

- ***Compound Condition Coverage** requires that all combinations of condition values at every branch statement will have been covered, and that every entry point will have been taken, at least once.*
- *Also know as **Multiple Condition Coverage***



SNO	TEST CASE OBJECTIVE	PRE CONDITION	STEPS / TEST DATA	EXPECTED RESULT	POST CONDITION	CONDITION PASS/FAIL
6	Username and Password	**Username** : Character length >= 8 and =< 12 and consists of only alphanumerics. **Password** : Character length >= 8 and =< 15	If U is Invalid and P is Invalid	Alert the user that both Username and Password are Invalid.	Stay in same page.	PASS
			If U is Invalid and P is Valid	Alert the user that Username does not match.	Stay in same page.	PASS
			If U is Valid and P is Invalid	Alert the user that Password do not match.	Stay in same page.	PASS
			If U is Valid and P is Valid	Alert the user that both Username and Password are valid.	Direct to 'View Items' page.	PASS

Module -2 : **Journals**

7.) Selecting Journals under categories :

The system must display journals based on the choice of categories chosen by the user.

This test case can tested using White Box Testing (Compound Condition Coverage) since the user needs to choose products of category C1 and/or/not C2.

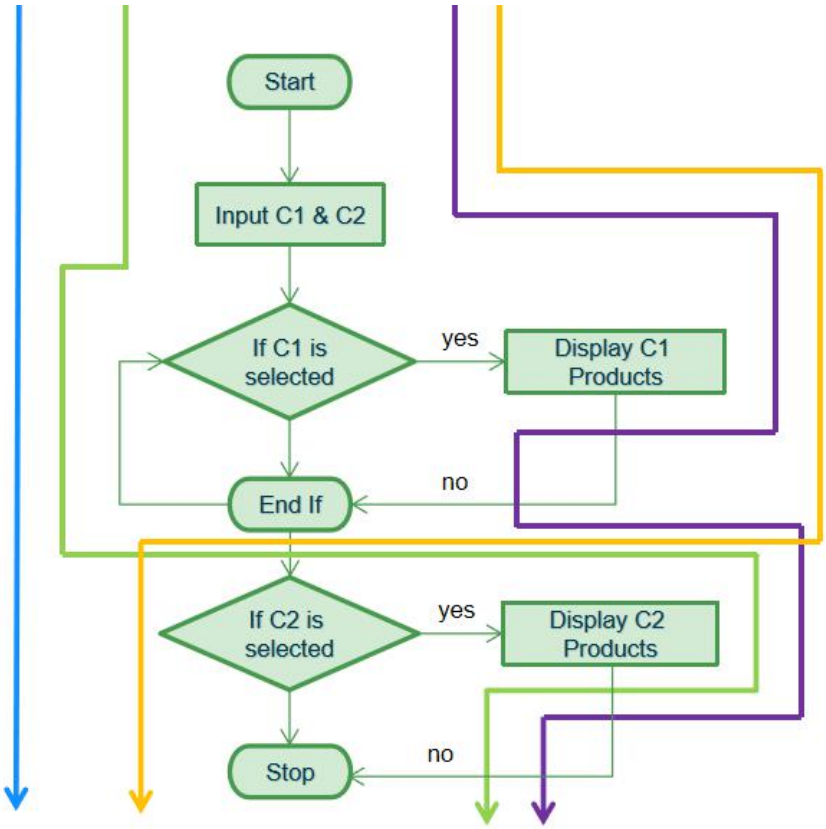
For Full coverage, we have 4 test cases,

Test_Case_01:
C1 – Not selected,
C2 – Not selected

Test_Case_02:
C1 – Not selected,
C2 – Selected

Test_Case_03:
C1 – Selected,
C2 – Selected

Test_Case_04:
C1 – Selected,
C2 – Not selected



SNO	TEST CASE OBJECTIVE	PRE CONDITION	STEPS / TEST DATA	EXPECTED RESULT	POST CONDITION	CONDITION PASS/FAIL
7	Category 1 (C1) and Category 2 (C2)	If Username and Password of the user is Valid.	If C1 is Not selected and C2 is Not selected	Display journals from categories other than C1 & C2.	Display Offers/ Recommendations	PASS
			If C1 is Not selected and C2 is Selected	Display jourals from category C2.	Display Offers/ Recommendations	PASS
			If C1 is Selected and C2 is Selected	Display jourals from categories C1 & C2.	Display Offers/ Recommendations	PASS
			If C1 is Selected and C2 is Not selected	Display jourals from category C1.	Display Offers/ Recommendations	PASS

Module - 4 : Editor Section

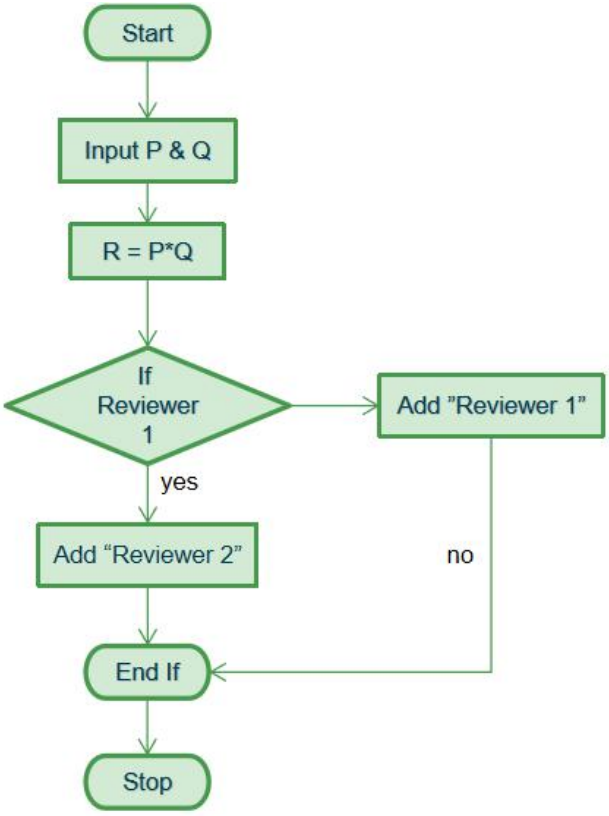
8.) **Adding Reviewers for Approval :**

If the editor adds a reviewer to the reviewers list, it must be updated in Reviewer Section.

This test case can tested using White Box Testing (Branch Coverage) since, the editor can add any numbeer of reviewers to reviewers List..

Branch Coverage :

- *Since Statement coverage is not sufficient to test the entire pseudo code, we would require Branch coverage to ensure maximum coverage.*
- *It is also known as **Edge Coverage.***



For Branch coverage, we have 2 test cases,

INPUT: P - Reviewer 1

Q - Reviewer 2

Test_Case_01: *Choice - Reviewer 1*

Test_Case_02: *Choice - Reviewer 2*

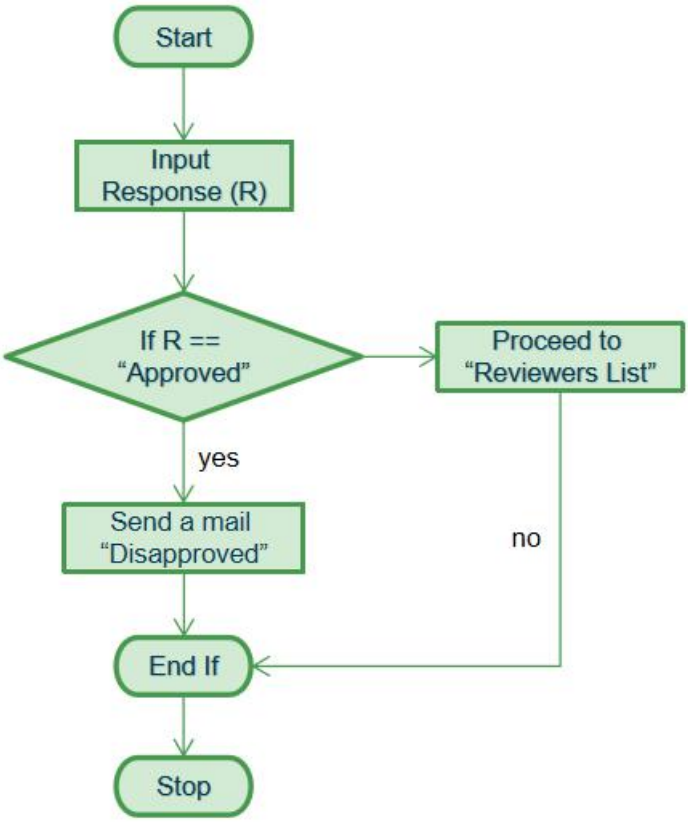
SNO	TEST CASE OBJECTIVE	PRE CONDITION	STEPS / TEST DATA	EXPECTED RESULT	POST CONDITION	CONDITION PASS/FAIL
8	Choice	If Username and Password of the user is Valid.	If Choice is "Reviewer 1"	Add products to "Reviewer 1"	Add Reviewer 1	PASS
			If Choice is "Reviewer 2"	Add products to "Reviewer 2"	Add Reviewer 2	PASS

Module - 4 : Editor Section

9.) **Stage 1 for approval :**

If the Editor wishes to approve a manuscript, proceed to the Reviewers List, else if he/she wants to disapprove the manuscript, the manuscript must be disapproved.

This test case can tested using White Box Testing (Branch Coverage) since, the Editor can approve manuscripts to proceed to reviewers list, else disapprove at the beginning.



For Branch coverage, we have 2 test cases,

Test_Case_01:
Choice – Approve

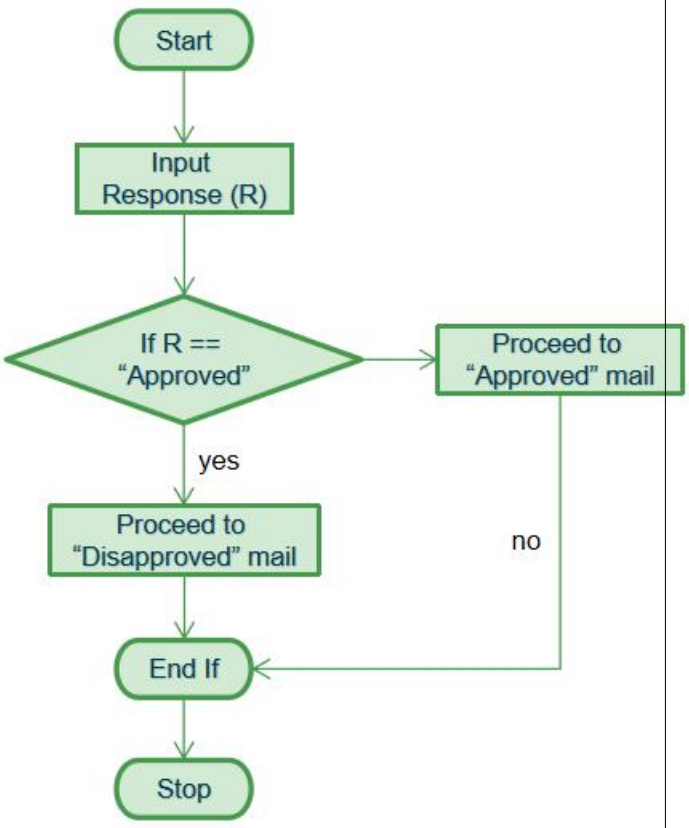
Test_Case_02:
Choice -- Disapprove

SNO	TEST CASE OBJECTIVE	PRE CONDITION	STEPS / TEST DATA	EXPECTED RESULT	POST CONDITION	CONDITION PASS/FAIL
9	Choice	If Username and Password of the user is Valid.	If Choice is "Approve"	Proceed to Reviewers List	Display Reviewers List	PASS
			If Choice is "Disapprove"	Display "Disapproved"	Send mail regarding disapproval	PASS

Module - 4 : Reviewer Section

10.) Stage 2 for Approve/Disapprove Manuscript :

If the Reviewer wishes to approve a manuscript, proceed with sending mail as "Submission Accepted",
else if
he/she wants to disapprove the manuscript, the manuscript must be disapproved followed by sending mail as "Submission Disapproved".



This test case can tested using White Box Testing (Branch Coverage) since, the Editor can approve manuscripts to proceed with "Success" mail message, else disapprove to proceed with Not Accepted" mail message.

For Branch coverage, we have 2 test cases,

Test_Case_01:
Choice – Approve

Test_Case_02:
Choice -- Disapprove

SNO	TEST CASE OBJECTIVE	PRE CONDITION	STEPS / TEST DATA	EXPECTED RESULT	POST CONDITION	CONDITION PASS/FAIL
9	Choice	If Username and Password of the user is Valid.	If Choice is "Approve"	Add to Approved submissions in Author Main Menu	Proceed to "Success" mail message	PASS
			If Choice is "Disapprove"	Add to Disapproved submissions in Author Main Menu	Proceed to "Disapproved" Mail message	PASS