API(Application programming interface)/APi is a collection of programs:

Difference between scripting and programming language:

A programming language is a type of computer language that consists of a set of instructions for communicating with computers. A scripting language is a kind of programming language that is used to automate the execution of operations in a runtime environment.

Cmp--→prog→scripting

Input(request)→respons(output).

All web services are APIS.

Load testing for short time i.e. one hour

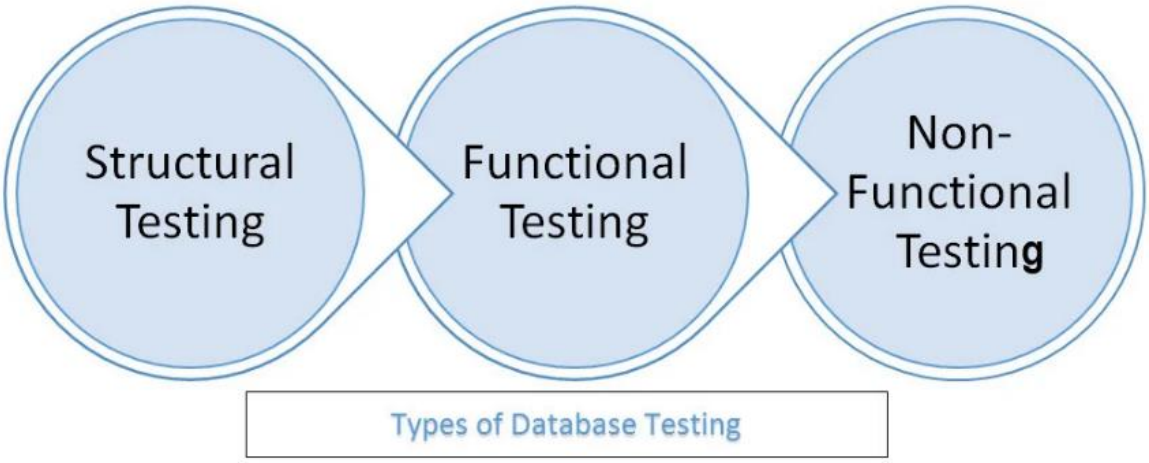
Endurance testing for long time i.e. one year

Stress testing**Endurance Testing Example**

While **Stress testing** takes the tested system to its limits, **Endurance testing** takes the application to its limit **over time**.

For Example, the most complex issues – memory leaks, database server utilization, and unresponsive system – happen when software runs for an extended period of time. If you skip the endurance tests, your chances of detecting such defects prior to deployment are quite low.

Types of Database Testing



Schema Testing (mapping testing)

What is TRIM () in SQL?

SQL Server TRIM() Function

The TRIM() function **removes the space character OR other specified characters from the start or end of a string**. By default, the TRIM() function removes leading and trailing spaces from a string.

Some of the useful Database Testing tools for testing stored procedures are LINQ , SP Test tool etc.

What is a Stored Procedure? A stored procedure is **a prepared SQL code that you can save, so the code can be reused over and over again**. So if you have an SQL query that you write over and over again, save it as a stored procedure, and then just call it to execute it.

What is Path Testing?

Path testing is a structural testing method that involves using the source code of a program in order to find every possible executable path. It helps to determine all faults lying within a piece of code. This method is designed to execute all or selected path through a computer program.

Any software program includes, multiple entry and exit points. Testing each of these points is a challenging as well as time-consuming. In order to reduce the redundant tests and to achieve maximum test coverage, basis path testing is used.

Advantages of Basic Path Testing

- It helps to reduce the redundant tests
- It focuses attention on program logic
- Test cases which exercise basis set will execute every statement in a program at least once

Conclusion:

Basis path testing helps to determine all faults lying within a piece of code.

What is Test Strategy Document?(testing approach + objectives of testing)/

testing approach and testing objective. derived from actual business requirements. A Test strategy document answers all the questions like what you want to get done and how you are going to accomplish it, etc.

ٹیسٹ حکمت عملی کی دستاویز ان تمام سوالات کے جوابات دیتی ہے جیسے آپ کیا کرنا چاہتے ہیں اور آپ اسے کیسے پورا کرنے جا رہے ہیں، وغیرہ۔

Test Plan	Test Strategy
• In the Test Plan, test focus and project scope are defined. It deals with test coverage, scheduling, features to be tested, features not to be tested, estimation and resource management.	• Test strategy is a guideline to be followed to achieve the test objective and execution of test types mentioned in the testing plan. It deals with test objective, test environment, test approach, automation tools and strategy, contingency plan, and risk analysis

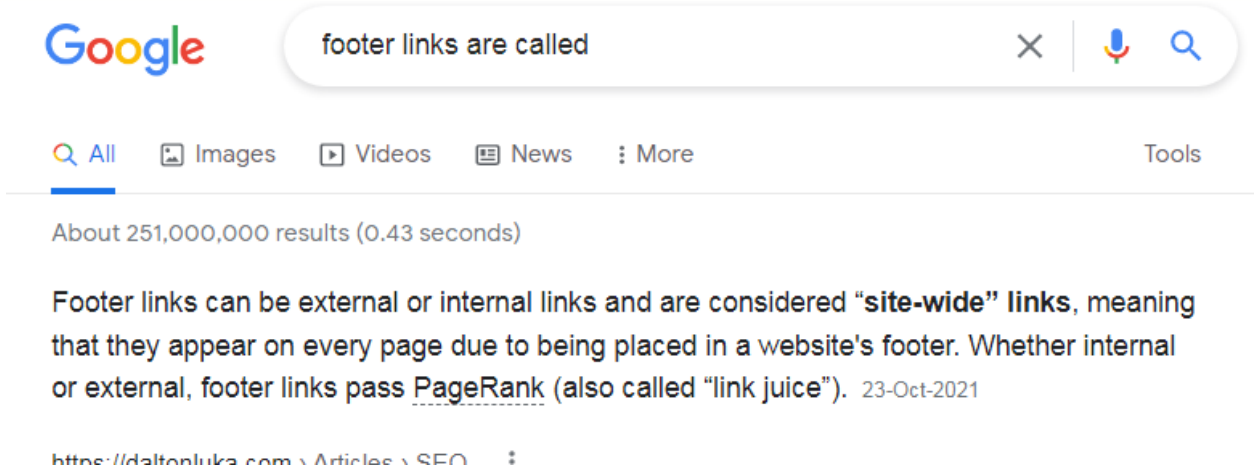
To make it clearer **if the Test Plan is some destination then QA Test strategy is a map to reach that destination.**

https://jsonplaceholder.typicode.com/

https://reqres.in/

https://www.programmableweb.com/content/search?keyword=publicly%20available%20APIs

```
tests["Validating Status Code"]=responseCode.code==200;
tests["Validating response body"]=responseBody.has("michael.lawson@reqres.in");
var response=JSON.parse(responseBody);
tests["page no"]= response.page ==2;
```



API GET Req:

1. https://reqres.in/api/users?page=2
2. https://reqres.in/api/users/2

```
3. var response= JSON.parse(responseBody);
4. tests["verify first_name"]=response.data.first_name=="Emma";
5. tests["verify last_name"]=response.data.last_name== "Wong";
```

API POST Req:

```
6. var response = JSON.parse(responseBody);
7. tests["name"] = response.name == "morpheus";
8. tests["job"]=response.job== "leader";
9. tests["Validating Status Code"]=responseCode.code==201;
```

For token passing:

```
tests["Validating token presence"]=responseBody.has("token");
```

Welcome Dummy api example

https://dummy.restapiexample.com/

https://dummy.restapiexample.com/api/v1/employees

```
var response=JSON.parse(responseBody);
tests["name"]=response.data[1].employee_name=="Garrett Winters";
```

https://dummy.restapiexample.com/api/v1/employee/5

For Post Request:

https://dummy.restapiexample.com/api/v1/create

```
{"name":"Kt123", "salary":"200","age":"22"}
```

https://www.learningcontainer.com/sample-json-file/

code with mosh

https://learning.postman.com/docs/getting-started/importing-and-exporting-data/

https://translate.google.com/?sl=auto&tl=fr&text=https%3A%2F%2Froyalleasewebsites.fr%2F%23&op=translate

چیک باکسز Checkboxes allow the user to choose items from a fixed number of alternatives,
صارف کو متبادل کی ایک مقررہ تعداد میں سے آئٹمز منتخب کرنے کی اجازت دیتے ہیں۔
while radio buttons allow the user to choose exactly one item from a list of several predefined alternatives.

جبکہ ریڈیو بٹن صارف کو کئی پہلے سے طے شدہ متبادلات کی فہرست میں سے بالکل ایک آئٹم کا انتخاب کرنے کی اجازت دیتے ہیں۔

https://artoftesting.com/ecommerce

1. Verify that all the specified fields are present on the registration page.
2. Verify that the required/mandatory fields are marked with * against the field.
3. Verify that for better user interface dropdowns, radio buttons and checkboxes, etc fields are displayed wherever possible instead of just textboxes
4. Verify that not filling the mandatory fields and clicking the submit button will lead to validation error.

5. Verify that not filling the optional fields and clicking the submit button will still send data to the server without any validation error.
6. Check the upper limit of the textboxes.
7. Check validation on numeric fields by entering alphabets and special characters.
8. Verify that leading and trailing spaces are trimmed.
9. Verify that entering blank spaces on mandatory fields leads to validation error.

https://www.guru99.com/testing-mobile-apps.html

Penetration testing

Penetration testing is also called pen testing or ethical hacking, is the practice of testing a computer system, network or web application to find security vulnerabilities that an attacker could exploit. Penetration testing can be automated with software applications or performed manually.

Agile model/ Agile methodology/ Agile process

It is an incremental and iterative model

Agile principles:

1) **Customer no need to wait for long time.**
2) **We develop, test and release piece of software to the customer with few number of features.**
3) **We can accept/ accommodate requirement changes.**

There will be good communication between customer, business analyst, ,developer and tester

Advantages:

1. **Requirement change are allowed in any stage of development (or)we can accommodate the requirements changes in the middle of development.**
2. **Release will be very fast(weekly).**
3. **Customer no need to wait for long time.**
4. **Good communication between team.**
5. **It is very easy model to adopt.**

Disadvantages:

Less focuses on documentation and design.(very fast delivery to the customer).

Difference:

Agile is a process model(is a defined process with some principls)

Scrum is a framework through through which we develop the software and deliver to the customer by following agile principle.

Scrum includes group of people called as scrum team. Normally contains 5-9 members.

1. **Product Owner**
2. **Scrum Master**
3. **Dev Team**
4. **QA Team**

Product owner:

5. **Define the features of the product**
6. **Prioritize features according to market value**
7. **Adjust features and priority every iteration, as needed**
8. **Accept or reject work results.**

Scrum Master:

The main role is facilitating and driving the agile process.

Developers and QA:

Develop and test the software.

Scrum Terminology:

- **{ User story and Epic} made by product owner**

User story: A feature/module in software.(Small requirements)User stories will be derived from epic.

Epic: Collection of user stories.(Large requirements)

Product backlog: is a kind of excel sheet which contains all the user stories that are defined by the product owner at the beginning of agile process. Contains list of user stories. (made by product owner)

Sprint/Iteration: period of time to complete the user stories, decided by the product owner and team, usually 2-4 weeks of time.

Sprint planning meeting: meeting with the team to define what can be delivered in the sprint and duration.

Two things are focused during the Sprint planning meeting

{How many stories in the backlog we have how many stories we develop and test also include what is the duration of the sprint}

- **It is mostly one day meeting.**

Sprint backlog: list of committed stories by Dev/QA for specific sprint.

Scrum meeting: Meeting conducted by scrum master every 15 mins. called scrum call as standup meeting.

What did you do yesterday?

What will you do today?

Are there any impediments(blockrs) in your way?

Sprint retrospective meeting: what went well, what went wrng? Conducts meeting after completion of sprint. The entire team, including both the scrumMaster and the product owner should participate.

Story point: rough estimation of user stories, will be gives by dev and QA in the form of Fibonacci series.

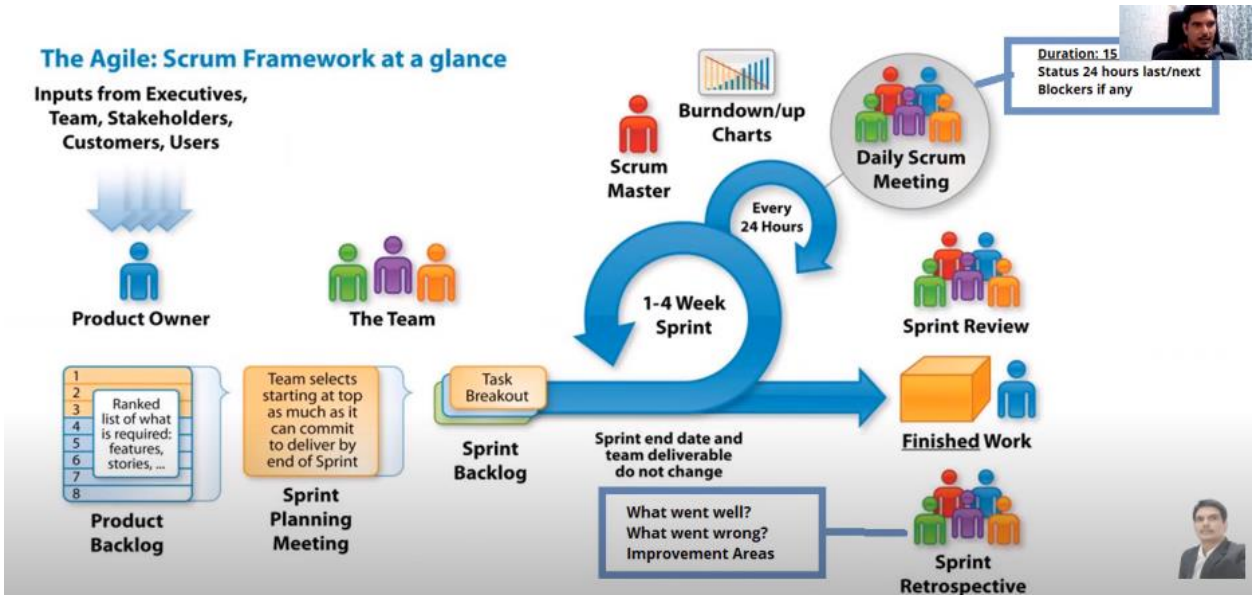
0 1 1 2 3 5 8……

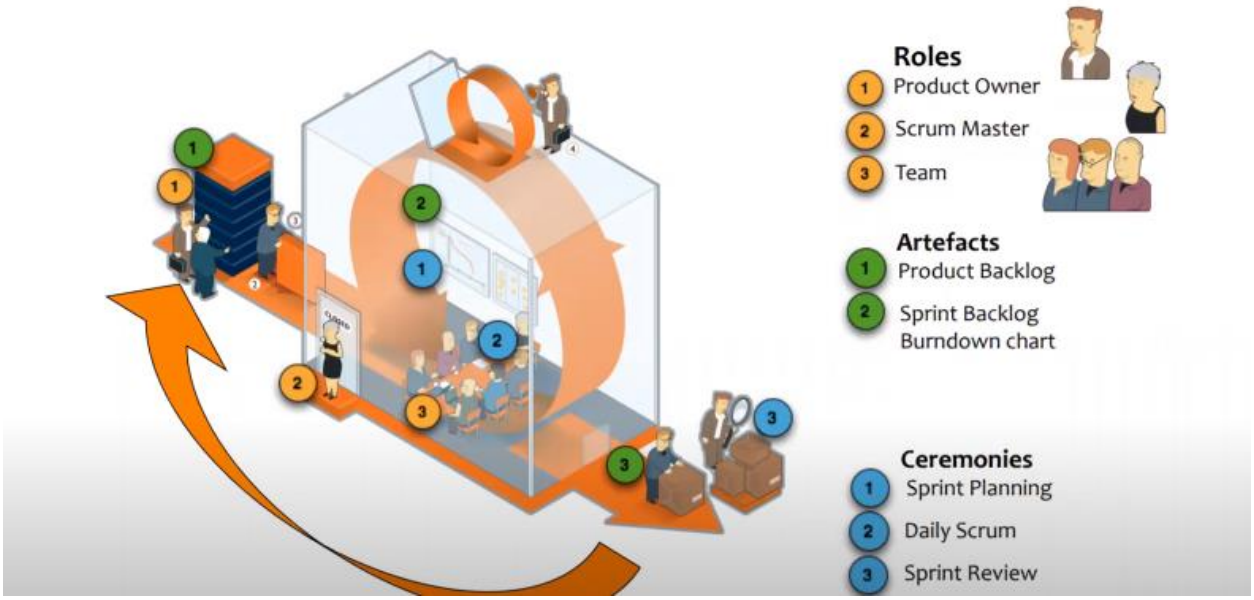
1 story point= 1hour/ 1day(6 hours)

Login------→Dev- 5 story point means 5 hours. QA-3

Burndown chart:(A graph which is prepared by the scrum master) Shows how much work remaining in the sprint. Maintained by the scrum master daily.

1 story – 3 days(18 hours)

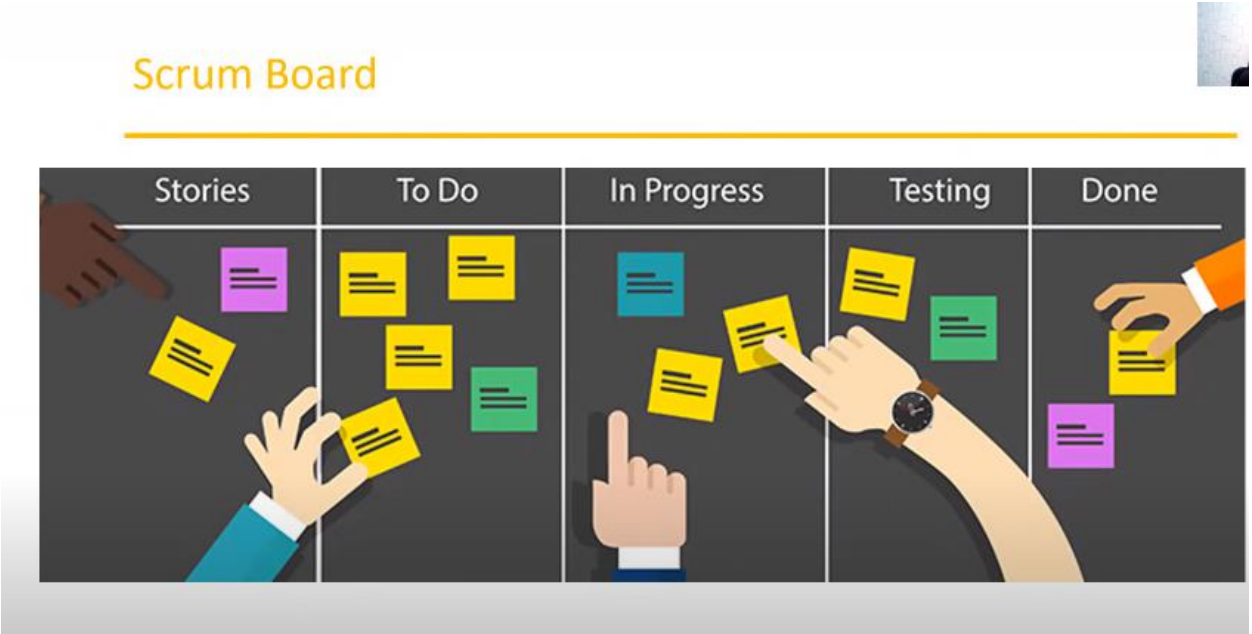




Product owner: define the requirements and writing the stories.

Scrum master: Organize the meeting.

Team: will perform the task(i.e Dev and QA) team will develop and test the App.



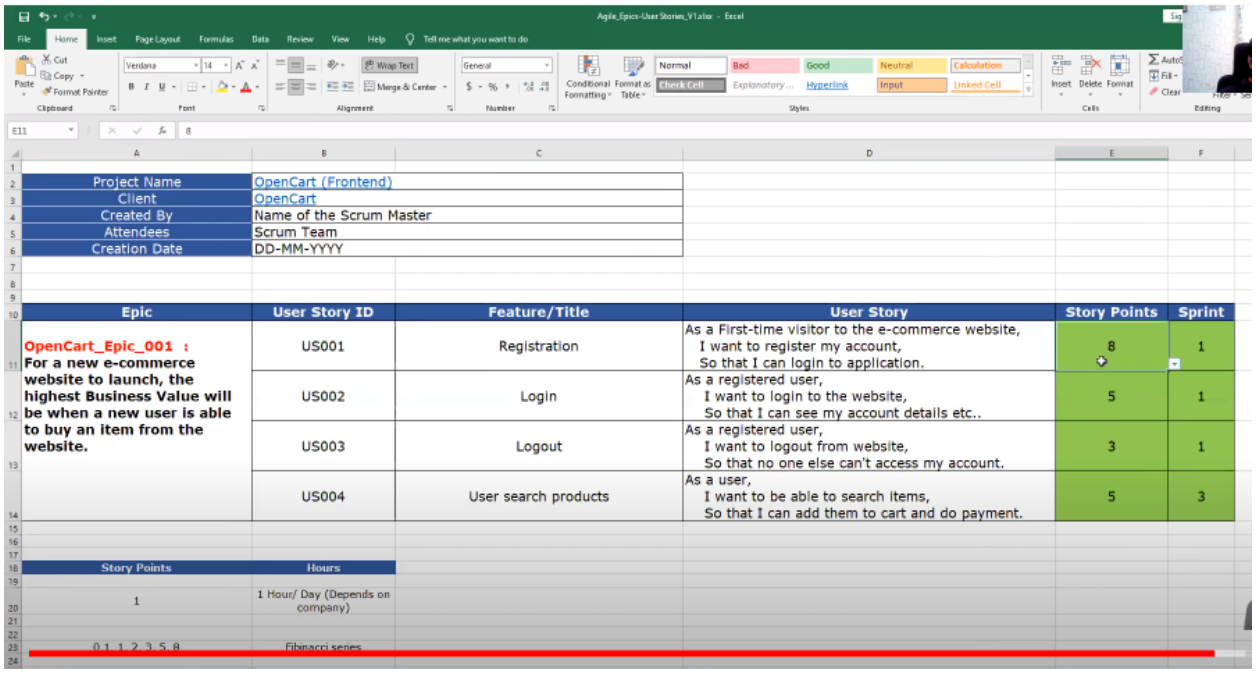
Definition of Ready (DoR) & Definition of Done (DoD)

Definition of Ready (DoR)

- User Story is clear
- User Story is testable
- User Story is feasible
- User Story defined
- User Story Acceptance Criteria defined
- User Story dependencies identified
- User Story sized by Development Team
- Scrum Team accepts User Experience artefacts
- Performance criteria identified, where appropriate
- Team has a good idea what it will mean to Demo the User Story

Definition of Done (DoD)

- Code produced (all 'to do' items in code completed)
- Code commented, checked in and run against current version in source control
- Peer reviewed (or produced with pair programming) and meeting development standards
- Builds without errors
- Unit tests written and passing
- Deployed to system test environment and passed system tests
- Passed UAT (User Acceptance Testing) and signed off as meeting requirements
- Any build / deployment / configuration changes are implemented / documented / communicated
- Relevant documentation / diagrams produced and / or updated
- Remaining hours for task set to zero and task closed



Project Name	OpenCart (Frontend)
Client	OpenCart
Created By	Name of the Scrum Master
Attendees	Scrum Team
Creation Date	DD-MM-YYYY

Epic	User Story ID	Feature/Title	User Story	Story Points	Sprint
OpenCart_Epic_001 : For a new e-commerce website to launch, the highest Business Value will be when a new user is able to buy an item from the website.	US001	Registration	As a First-time visitor to the e-commerce website, I want to register my account, So that I can login to application.	8	1
	US002	Login	As a registered user, I want to login to the website, So that I can see my account details etc..	5	1
	US003	Logout	As a registered user, I want to logout from website, So that no one else can't access my account.	3	1
	US004	User search products	As a user, I want to be able to search items, So that I can add them to cart and do payment.	5	3

Story Points	Hours
1	1 Hour/ Day (Depends on company)
0,1, 1, 2, 3, 5, 8	Fibinacci series

Developer Tasks	QA Tasks
Under standing Requirements	Under standing Requirements
Desing	Writing Test Scenarios
Coding	Writing Test Cases
Unit Testing	Test Case Reviews
Integration Testing	Test Data Preparation
Code Review	Test Environment Setup
Bug Fixes	Test Execution
Team Meetings	Re-Testing Bugs
Any other...	Team Meetings
	Automation
	Any other...

Backlog(Product owner creat)-> Epic-> user stories

Creat sprint-> Add stories to the sprint->start sprint -> Add task for every story

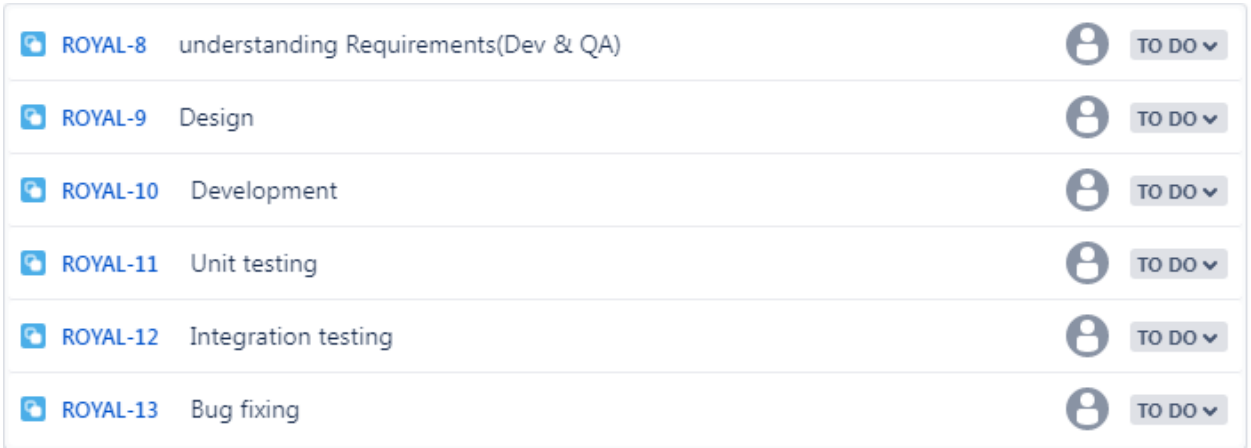
- **{Story+Task+ Issue}=issue type**

Epic-> Story(Small requirement)-> Story point(rough estimation is defined for particular story)

Story backlog contains the epic and the epic contains the multiple story along with the story points.

- **Task is a high level task the task be anything not specific to story(it can be a meeting and review)**

Developer Tasks



QA Tasks

ROYAL-14	Creating test scenairos & Test cases
ROYAL-15	Setup Env & Install Build
ROYAL-17	Execute test Cases

Static Testing

- In **Static Testing**, Manually verify the documentation involved in all Phases. It is also known as **"Verification"**

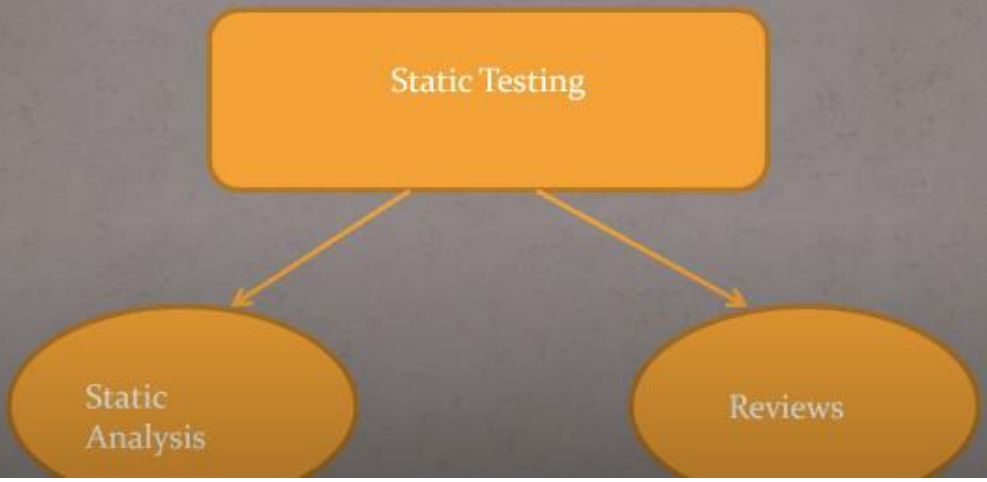
In this code is not executed

Dynamic Testing

- In **Dynamic Testing** code is executed to check whether the software is working according to client's requirements or not. It is also known as **"Validation"**

Static Testing

By this we can check the defects in software without actually executing it . It involves documentation verification and helps to find defects in early stage

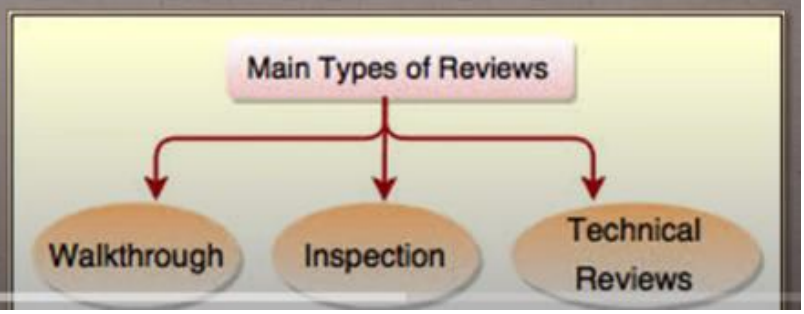


Static Analysis

is a method of computer program debugging that is done by examining the code without executing the program. It is performed by developers to check code structure and helps to find errors early.

Reviews

- Walkthrough
- Technical review
- Inspection



Lets discuss some roles and responsibilities in reviews to understand it better

➢ *The moderator*:- leads the review process. His role is to determine the type of review , scheduling meetings, distribute documents to other participants.

➢ *The author*:- He is the writer of the "document under review". His job is to understand improvements required.

➢ *The scribe/ recorder* :– He is responsible to record each defect found and any suggestions given in the meeting for process improvement.

➢ *The reviewer* :-to check defects and further improvements

Now Lets understand types of reviews

❑ **Walkthrough**

it is the informal review. In this the author reads the document or code and discuss with peers so that they note out the defects and suggestions . Its not preplanned and can be done whenever required.

❑ **Technical Review**

. It is led by Trained moderator and technical reviewers will read the document before meeting for better understanding and to suggest improvements to author.

Walkthrough is informal meeting not planning of anything.
Initiated by author.

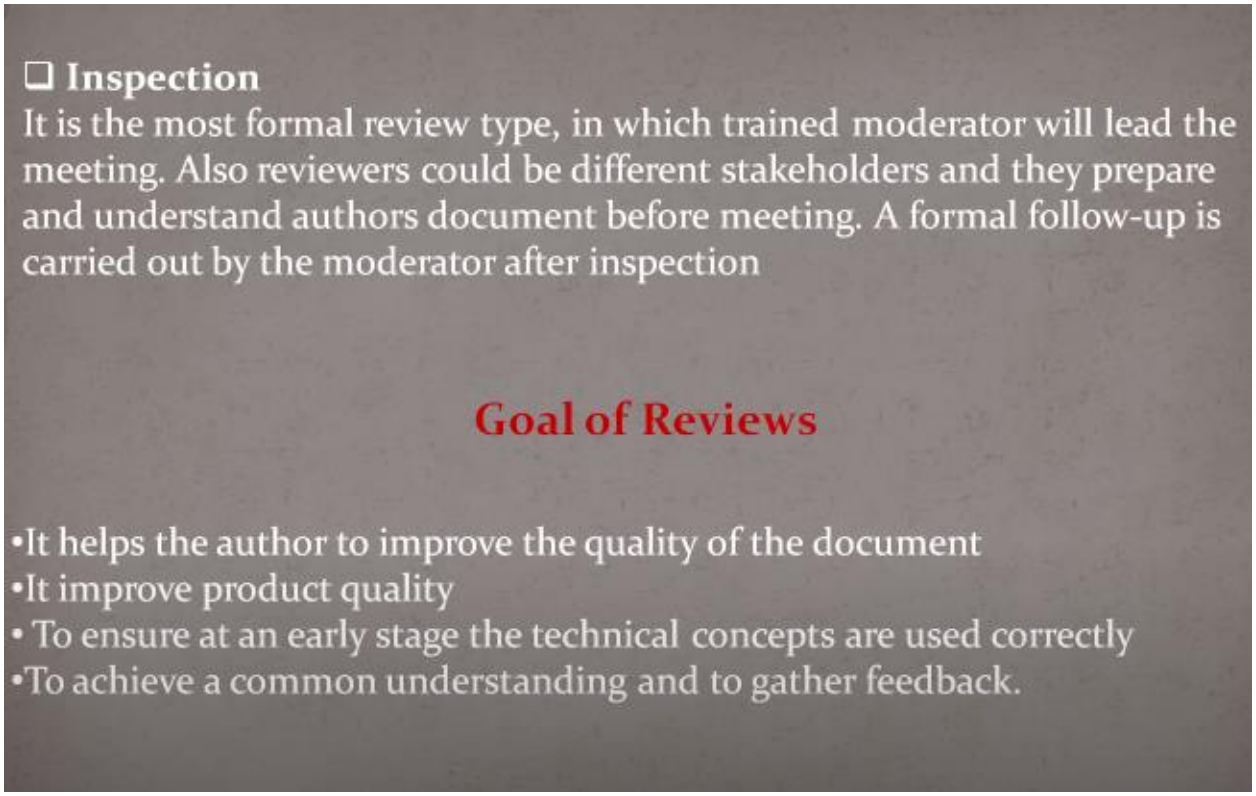
Inspection is a formal review.
Initiated by project team.

BEST VEdio(For Inspection)

https://www.youtube.com/watch?v=a2YUq_s5RW8

BEST VEdio(For Walkthrough)

https://www.youtube.com/watch?v=kS1zBCBBPjk



https://www.youtube.com/watch?v=iozKlclhDFM

Review