Programų kūrimo procesas

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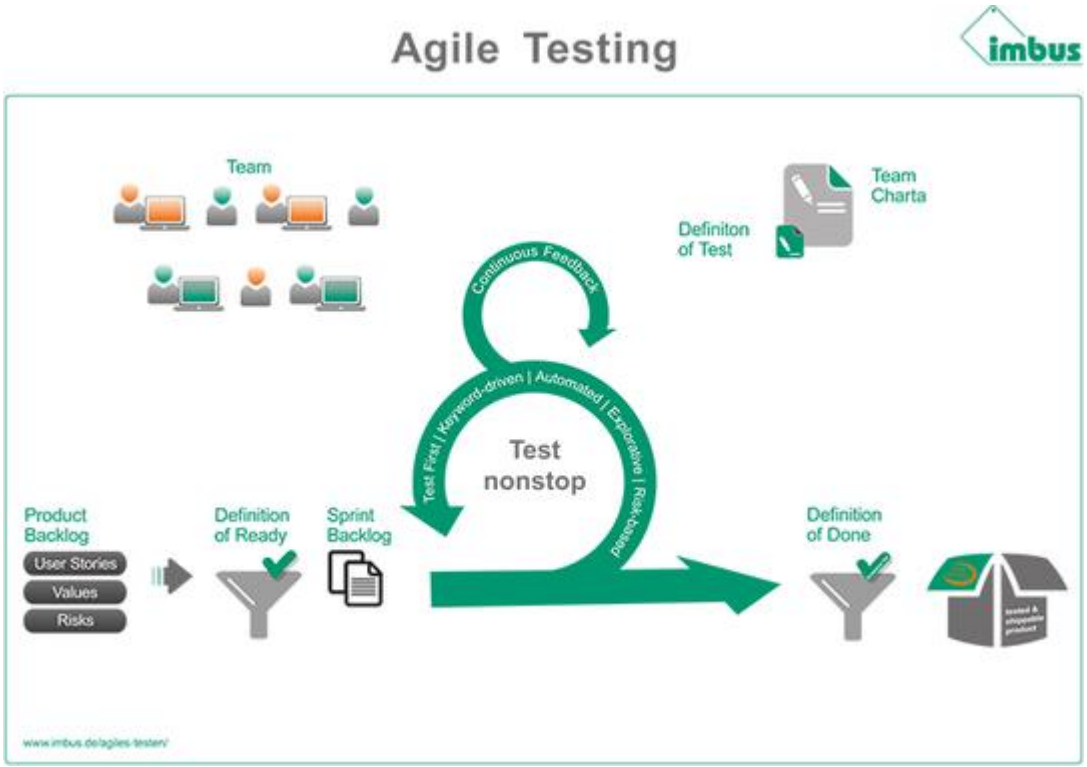
Challenges of Testing in Agile Development

- Requirements change all the time
- Specification documents are never final Code is never ‘finished’, never ‘ready for testing’
- Limited time to test
- Need for regression testing in each increment
  - Developers always break things
  - How can we trust that the code is not broken?

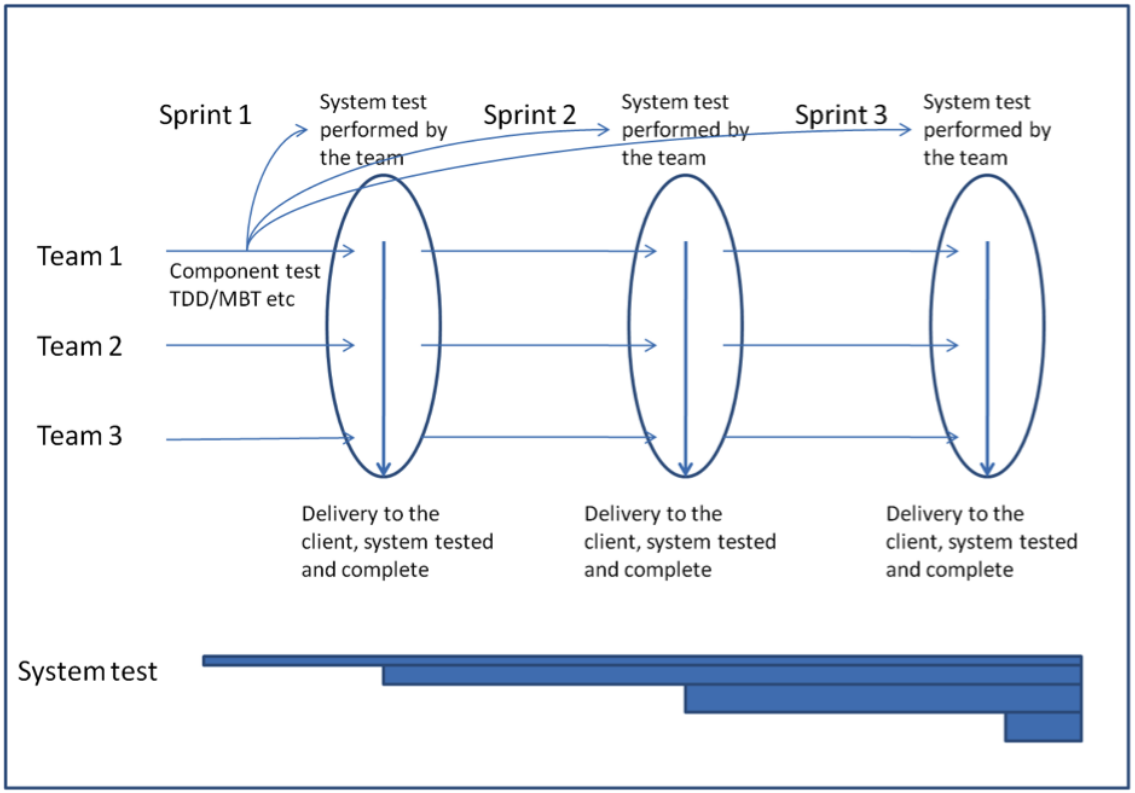
Agile Testing

- When we modify a system, the modification may result in some unintended and undesirable effects on the system.
- This **effect is called a regression**



Agile Testing

- Every iteration has its own testing phase.
- It allows implementing regression testing every time new functions or logic are released.



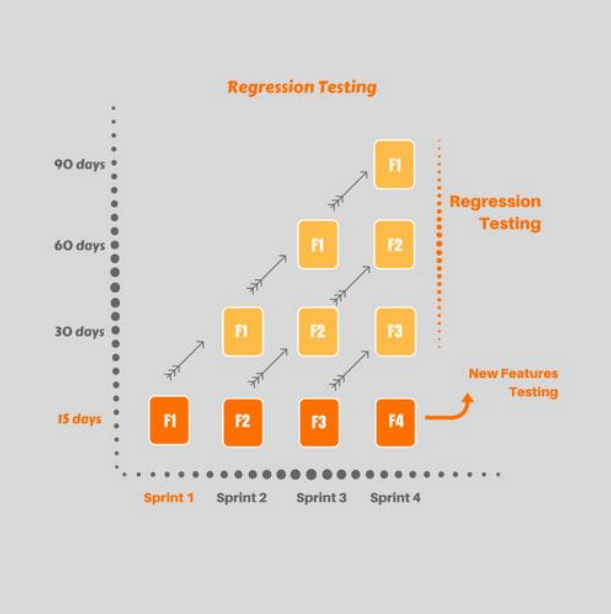
Types of tools of regresion

Regression tests must be automated

- Capture / Replay
  - Capture values entered into a GUI and replay those values on new versions –
- Version control
  - Keeps track of collections of tests, expected results, where the tests came from, the criterion used, and their past effectiveness –
- Scripting software
  - Manages the process of obtaining test inputs, executing the software, obtaining the outputs, comparing the results, and generating test reports

Agile Testing: Regression Testing

- **As the releases grow the functionality grows.**
- The development time does not necessarily grow with releases, but the testing time does
- No company/its management will be ready to invest more time in testing and less for development



Regression testing

- ***Regression testing*** **is the re-testing of the software to detect regressions.**

- That to detect regressions, **we need to retest all related components**, even if they had been tested before.
- Testing all the prior features and re-testing previously closed bugs

Definition: Regression Testing

- Regression testing is a type of software testing **that intends to ensure that changes** (enhancements or defect fixes) **to the software have not adversely affected it.**

- **Regression Testing** is defined as a type of software testing to **confirm** that a recent program or **code** change has **not adversely affected existing features**.

- Regression Testing is nothing but a full or partial selection of **already executed test cases** which are **re-executed to ensure existing functionalities work fine.**

  https://www.guru99.com/regression-testing.html

Regression Testing

- Regression testing is more effective when it is **done frequently**, after **each small change.**

- However, doing so can be prohibitively **expensive if testing is done manually.**

- Hence, **regression testing is more practical when it is automated**.

When apply the Regression Testing

Regression testing is required mainly in the these situations:

- Change in requirements and code is modified according to the requirement
- New feature is added to the software
- Configuration change
- Defect fixing
- Performance issue fix
- Patch fix

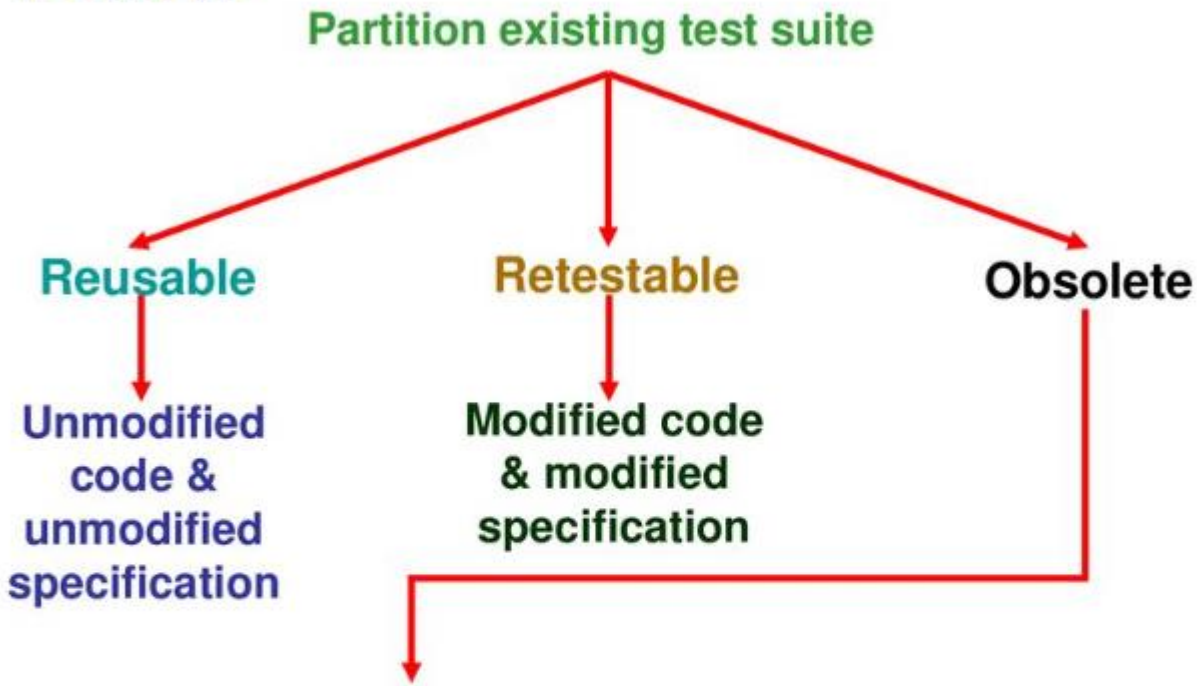
How much times apply regression testing

- In an ideal case, a full regression test is desirable
  - but often times there are time/resource constraints.

- It is essential to do **an impact analysis of the changes to identify areas of the software that have the highest probability** of being affected by the change and that have the highest impact to users in case of malfunction and focus testing around those areas

How much times apply regression testing

✓ **Retest all**



1. Specify incorrect Input Output relationships due to specification modification.
2. No longer exercise the components & specifications they were designed.

Regression Testing
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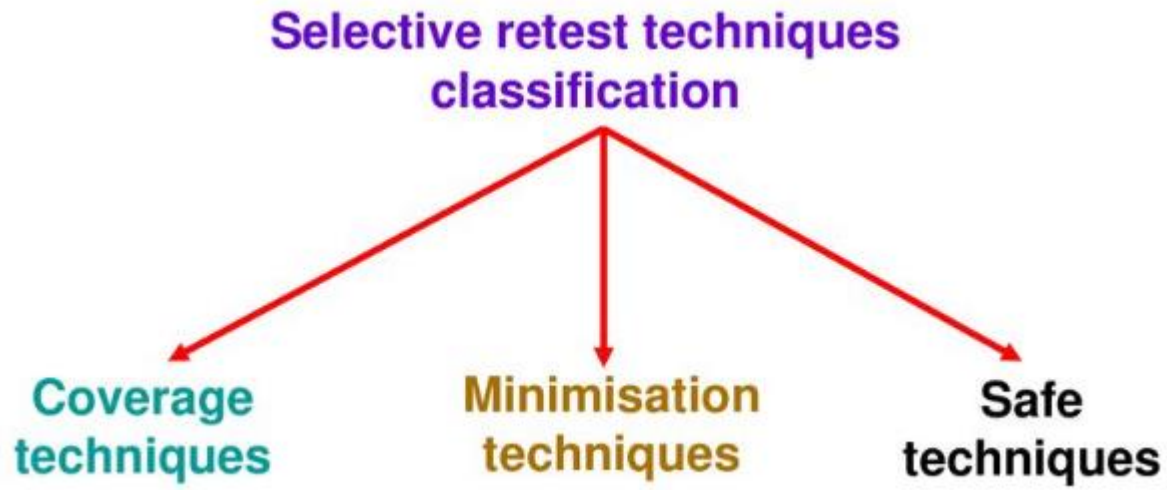
How much times apply regression testing

- Coverable Techniques
  - coverable program components that **have been modified**
  - **select test cases that exercise these components.**



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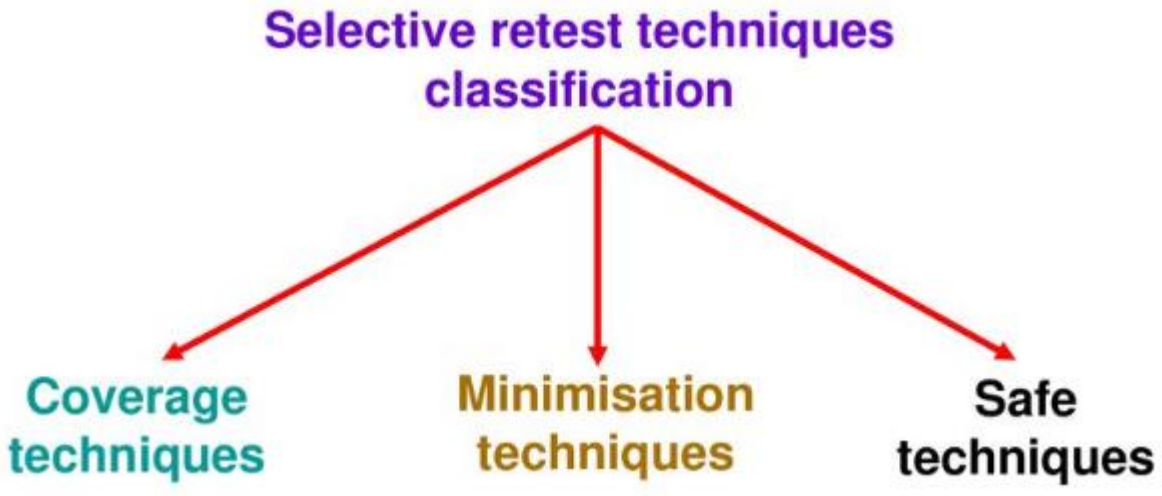
How much times apply regression testing

- Minimization Techniques
  - except that they **select minimal sets of test cases.**



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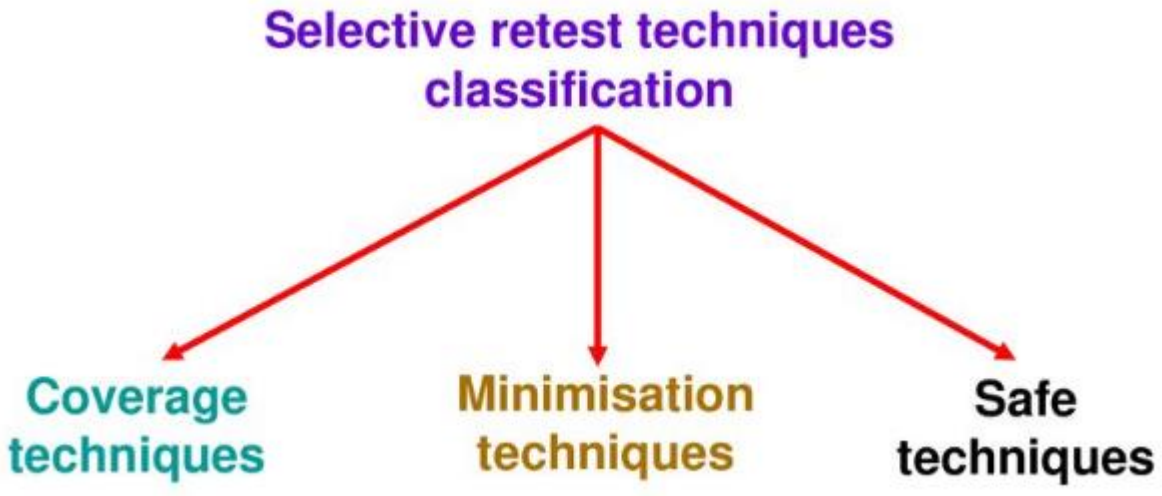
How much times apply regression testing

- Safe Techniques
  - select every test case that causes a modified program **to produce different output** than its original version.



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How much times apply regression testing

1. Reuse existing test suite
2. Add new tests as needed
3. Remove obsolete tests
4. Only code impacted by change needs to be retested
5. Select tests that exercise such code

Steps of Regression Testing

1. Write tests for new features added to the application
2. Execute tests on the new features added
3. Execute old test suite on the whole application
4. Execute old + new test suite on the whole application

Offer: using test automation, when apply J**enkins**

Retesting vs. Regression Testing

- **Retest means to test again**
  - Retesting is when you **repeat a test for any reason**.
  - retest current version functionality o
  - retest a bug fix,
  - retest previous version functionality,

https://searchsoftwarequality.techtarget.com/definition/regression-testing

Retesting vs. Regression Testing

- **Regressiont tests** are going to be new versions over existing ones.
  - There is piling on of new features, extensions, etc.
  - Necessary have to test the software's base for **strength and stability.**

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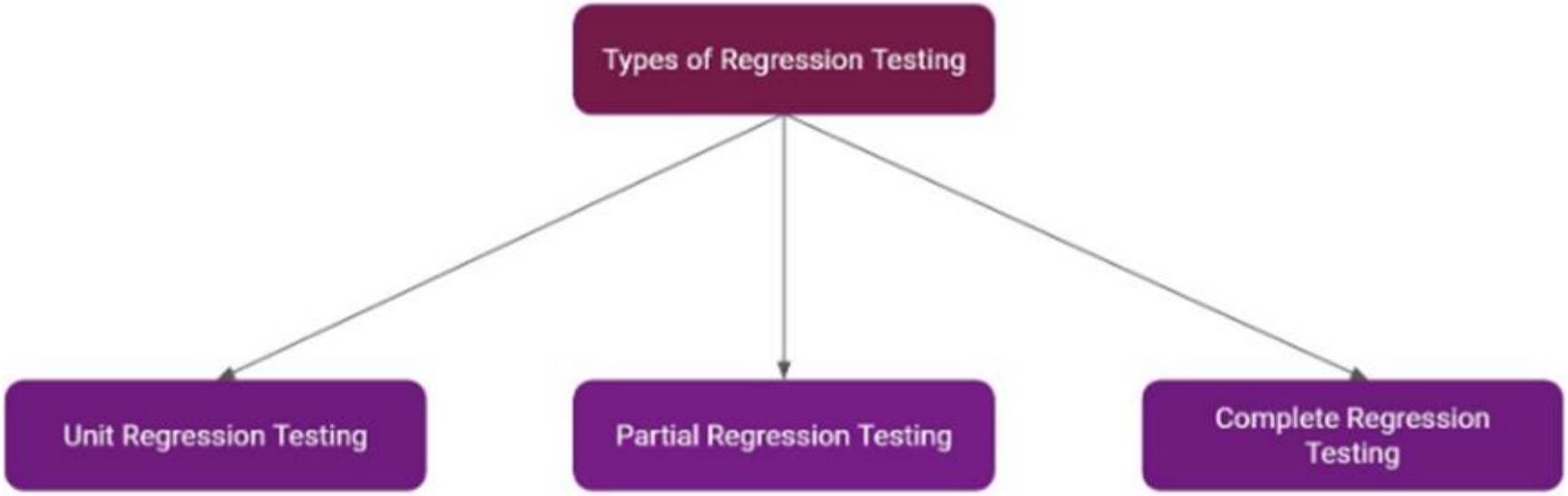
Types of Regression



Tools: Selenium, AdventNet Qengine, Regression Tester, vTest, Watir, actiWate and etc.

https://www.softwaretestinghelp.com/regression-testing-tools/

Types of Regression

1. Unit Regression
   - Unit regression means you **retest the changed module/area of the application ONLY.**
2. Partial Regression
   - Partial regression means you **retest the changed module. Plus include those that interact with it.**
3. Full Regression
   - Full regression is you **test the entire application** irrespective of the location of change.

Tools: Selenium, AdventNet Qengine, Regression Tester, vTest, Watir, actiWate and etc.

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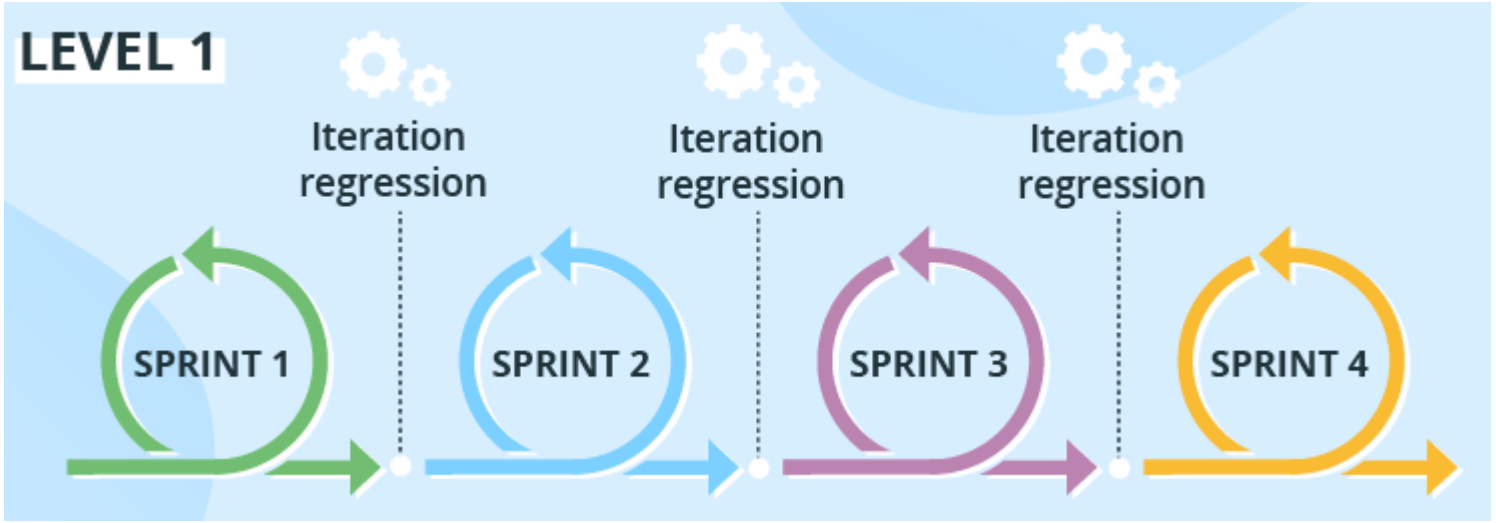
When a Regression Test Fails

- Regression test failures represent three possibilities :
  - The software has a fault – >Must fix the fix
  - The test values are no longer valid on the new version –> Must delete or modify the test
  - The expected output is no longer valid –>Must update the test

Regression In Agile

- Sprint Level Regression
  - Test cases from the test suite are selected as per **the newly added functionality or the enhancement that is done.**



Regression In Agile

- End to End Regression
  - Includes all the test cases that are to be re-executed to test the complete product end to end by covering all the core functionalities of the Product.
  - It is difficult to perform a GUI Regression test when the GUI structure is modified