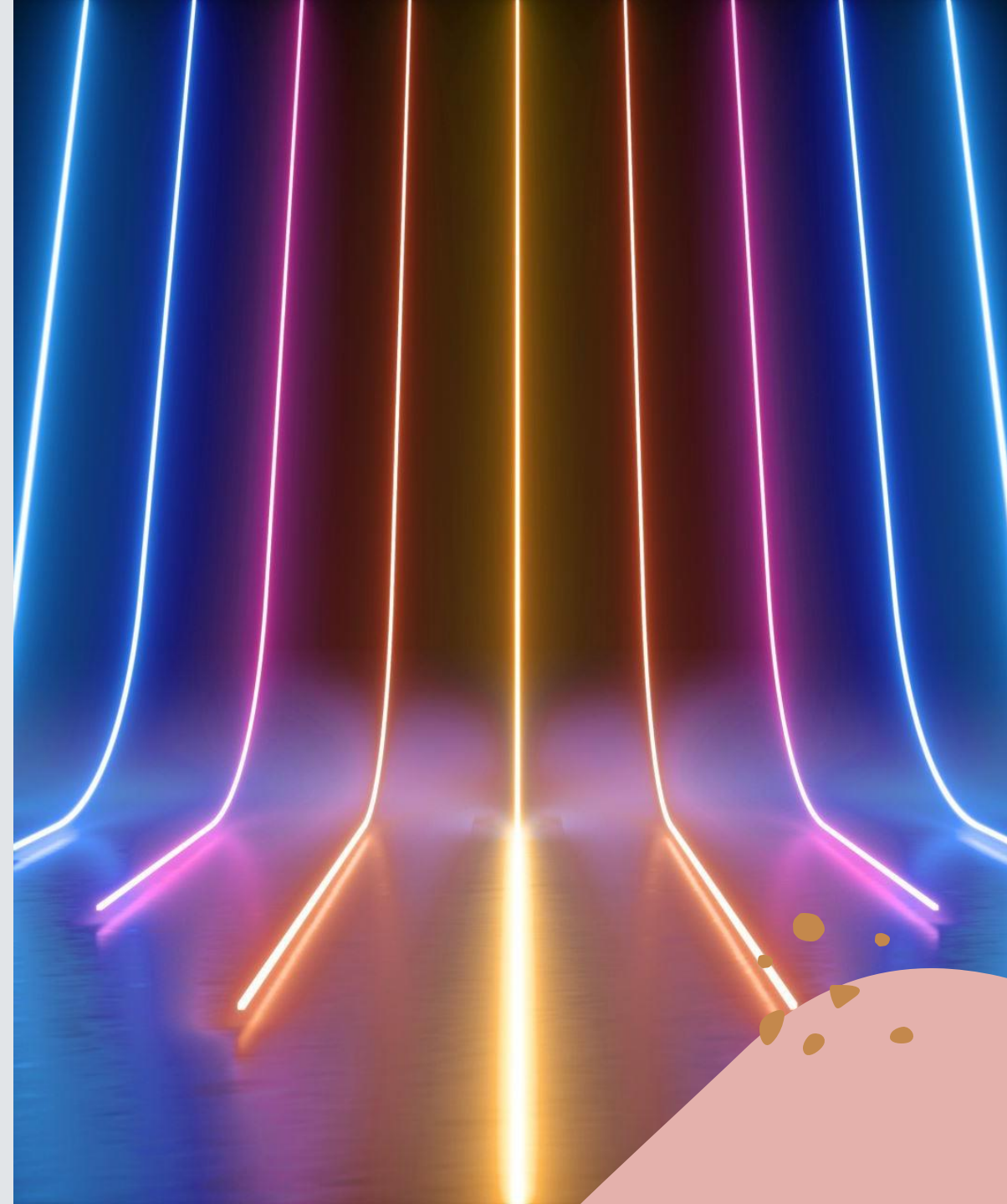


# *Report: Basics of Software Engineering*

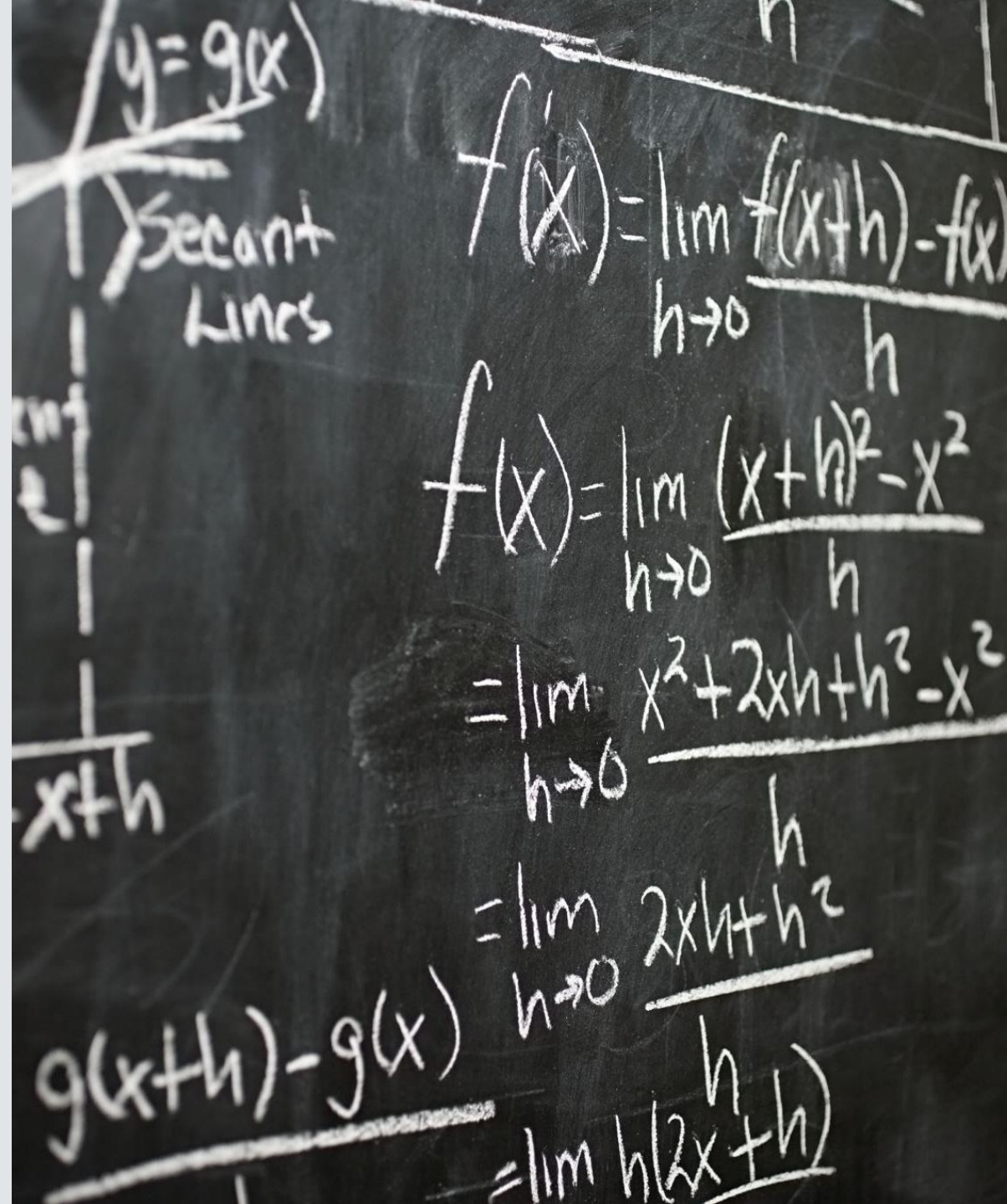
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# *Modelling Languages and Benefits*

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$y = g(x)$

Secant Lines

$$f'(x) = \lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h}$$
$$f(x) = \lim_{h \rightarrow 0} \frac{(x+h)^2 - x^2}{h}$$
$$= \lim_{h \rightarrow 0} \frac{x^2 + 2xh + h^2 - x^2}{h}$$
$$= \lim_{h \rightarrow 0} \frac{2xh + h^2}{h}$$
$$= \lim_{h \rightarrow 0} h(2x + h)$$

$g(x+h) - g(x)$

$x+h$

# *Introduction to Modelling Languages*

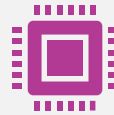
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Unified Modeling Language : Primarily for visualizing, specifying, constructing, and documenting software systems



Entity-Relationship Diagrams : Entity-Relationship Diagrams stand as fundamental tools in software engineering, dedicated to visually representing the entities within a system and elucidating their relationships



Data Flow Diagrams : Data Flow Diagrams constitute essential tools in software engineering, offering graphical representations that showcase the flow of data within a system, outlining inputs, processes, and outputs



BPMN : BPMN stands as a standardized framework for business process modeling, employing graphical notation to represent various aspects of business processes

# *Benefits of Modelling Languages in System Design*

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**Clarity and Visualization:** The essence of clarity and visualization in software engineering lies in the provision of vivid and comprehensive models that facilitate effective communication among stakeholders

**Error Identification:** Early error identification stands as a cornerstone in software development, offering the advantage of detecting flaws and inconsistencies in system design or requirements at an initial stage

**Improved Collaboration:** Improved collaboration in software engineering is facilitated through the use of models and visual representations, fostering seamless interaction among multidisciplinary teams

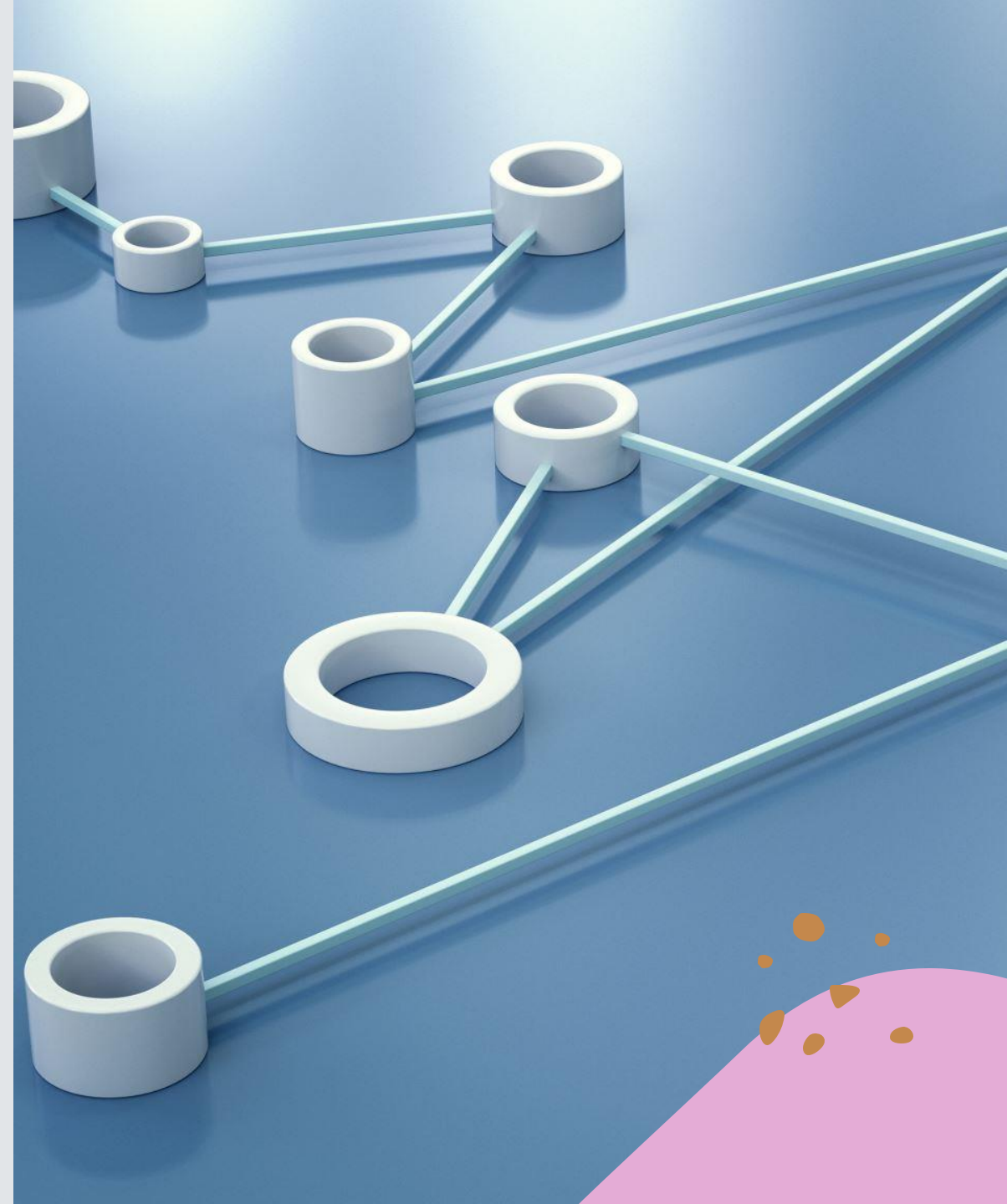




# *Benefits of Modelling Languages in System Design*

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Efficiency and Consistency: Efficiency and consistency are paramount in software development, ensuring a streamlined system development lifecycle





# *Management of Software Testing Strategies*

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# *Evaluation of Software Testing Strategies*

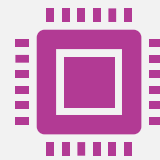
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Black Box Testing: Evaluates system functionality without knowledge of internal structures



White Box Testing: Focuses on internal structures, examining code and logic



Unit Testing, Integration Testing, and System Testing: Ensures different facets of system functionality

*Conclusion:  
Stages of System  
Testing and  
Automation Tools*

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# *Stages of System Testing*

Unit Testing: Unit Testing involves isolating individual components or units of software and subjecting them to tests to verify their functionality in isolation

Integration Testing: Integration Testing is a critical phase in software development that involves combining and testing modules together to ensure they function cohesively as an integrated system

System Testing: System Testing involves a comprehensive evaluation of the entire software system to validate its compliance with predetermined requirements and specifications

Acceptance Testing: Acceptance Testing serves as the final phase in software testing, validating whether the software meets user-defined requirements and specifications



# *Evaluation of Testing Tools for Automation*

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Automation tools such as Selenium, JUnit, and TestNG play a pivotal role in expediting the software testing process, enhancing efficiency, and ensuring the reliability of software systems

Selenium, a widely-used open-source automation tool, is particularly renowned for its capabilities in automating web application testing

Selenium's flexibility and extensibility allow the creation of robust test scripts in multiple programming languages

In conclusion, automation tools such as Selenium, JUnit, and TestNG offer robust capabilities that expedite testing processes, particularly in regression testing, while ensuring the reliability and consistency of software systems

