**Practical No 11**

**Aim: Create a documentation of SRS, SDS using UML diagrams and also generate code from UML model.**

**What is SRS and SDS (Software Design Specification)**

**SRS (Software Requirement Specification):**

A software requirements specification (SRS) is a detailed description of a software system to be developed with its functional and non-functional requirements. The SRS is developed based the agreement between customer and contractors. It may include the use cases of how user is going to interact with software system. The software requirement specification document consistent of all necessary requirements required for project development. To develop the software system, we should have clear understanding of Software system. To achieve this, we need to continuous communication with customers to gather all requirements. A good SRS defines the how Software System will interact with all internal modules, hardware, communication with other programs and human user interactions with wide range of real-life scenarios. Using the Software requirements specification (SRS) document on QA lead, managers creates test plan. It is very important that testers must be cleared with every detail specified in this document in order to avoid faults in test cases and its expected results. It is highly recommended to review or test SRS documents before start writing test cases and making any plan for testing. Let’s see how to test SRS and the important point to keep in mind while testing it.

**Qualities of SRS are:**

**1. Correctness of SRS should be checked.**

**2. Ambiguity should be avoided.**

**3. Requirements should be complete.**

**4. Consistent requirements.**

**5. Verification of expected result**

**6. Testing environment.**

**7. Pre-conditions defined clearly.**

**8. Requirements ID.**

**9. Security and Performance criteria.**

**10. Assumption should be avoided.**

**11. Deletion of irrelevant requirements.**

**12. Freeze requirements.**

**SDS (Software Design Specification):**

**The software design specification (SDS) ensure that the final outputted software product meets the requirements of the end customer, i.e. functions as expected, is reliable, is easy to use, does not demand inordinate efforts to train staff in its use, etc. Specifically, the software design specification is a description of the software components and sub-systems to be provided as part of the product.**

**A comprehensive SDS will detail the following generic information:**

* **The specific “need(s)” to be fulfilled by the software.**
* **Information on how these “needs” will be met via linking to a set of “features”.**
* **How the “features” will address the customer requirements.**
* **How the “features” will be implemented.**
* **Reference to the specific or overall approach to confirming effective implementation, i.e. the validation process.**

**In many organizations and especially those with a pre-defined quality management system, the format of software design documentation will be standardized. The following are generic requirements, widely applied, but can be modified to suit particular organizational needs.**

**i) Purpose of the software design specification (SDS) document.**

**ii) Approach to solving the customer “needs”.**

**iii) Reference documentation.**

**iv) Definitions, acronyms, and abbreviation.**

**v) Description of the system architecture, structure and relationships, user interfaces.**

**vi) Description of components.**

**vii) Relationship to other components.**

**viii) Design decisions and trade-offs.**

**viii) Costing – The estimated resource requirements.**

**ix) Risks – Where there are potential risks to the entire project or risks in terms of significant variation to timelines, costings, etc.**

**x) Pseudo-code for components.**

**xi) Appendices.**

**How UML diagrams will effectively use in SRS and SDS?**

A Software Requirements Specification (SRS) is a document, which is used as a communication medium between the customers. A software requirement specification in its most basic form is a formal document used in communicating the software requirements between the customer and the developer. An SRS document concentrates on WHAT needs to be done and carefully avoids the solution (how to do). It serves as a contract between development team and the customer. The requirements at this stage is written using end user terminology. If necessary, later a formal requirement specification will be developed from it. SRS is a complete description of the behaviour of a system to be developed and may include a set of use-cases that describes the interactions, the users will have with the software.

**The purpose of SRS are:**

i) SRS is a communication tool between Customer / Client, Business Analyst, System developers, Maintenance teams.

ii) It can also be a contract between purchaser and supplier.

iii) It will give firm foundation for the design phase.

iv) Supports project management and control.

v) Helps in controlling and evolution of system.

vi) A software Requirement specification should be Complete, Consistent, Traceable, Unambiguous, and Verifiable.

**The following should be addressed in system specification**

i) Define the functions of the systems

ii) Define the Hardware / Software Functional Partitioning

iii) Define the Performance Specification

iv) Define the Hardware / Software Performance Partitioning

v) Define Safety Requirements

vi) Define the User Interface (user’s manual)

vii) Provide Installation Drawings/Instructions

viii) Software Requirement specification template

**Steps for code Generation from UML model**

**Step 1: Open StarUML and open your UML diagram for the source code you want to generate.**

**Step 2: Open extension manager from the tool’s menu and search for java extension and install it.**

**Step 3: Once it installed the extension sub-menu will be there under the tool’s menu called as Java. Click on that and it will ask for two options generate code or reverse code.**

**Step 4: Click on generate code option and select the base model you want to generate and save the file in the directory you want to save.**

**Step 5: Once it saved open the directory in which the code was generated and open it with Notepad++ or Eclipse to view the code.**

**Conclusion: We have created a documentation of SRS, SDS using UML diagrams and also generate code from UML model.**