Software Engineering Lab Report II

Automated Lab Program Evaluator

Ashwin Joisa : 16CO104

Praveen Raj : 16CO115

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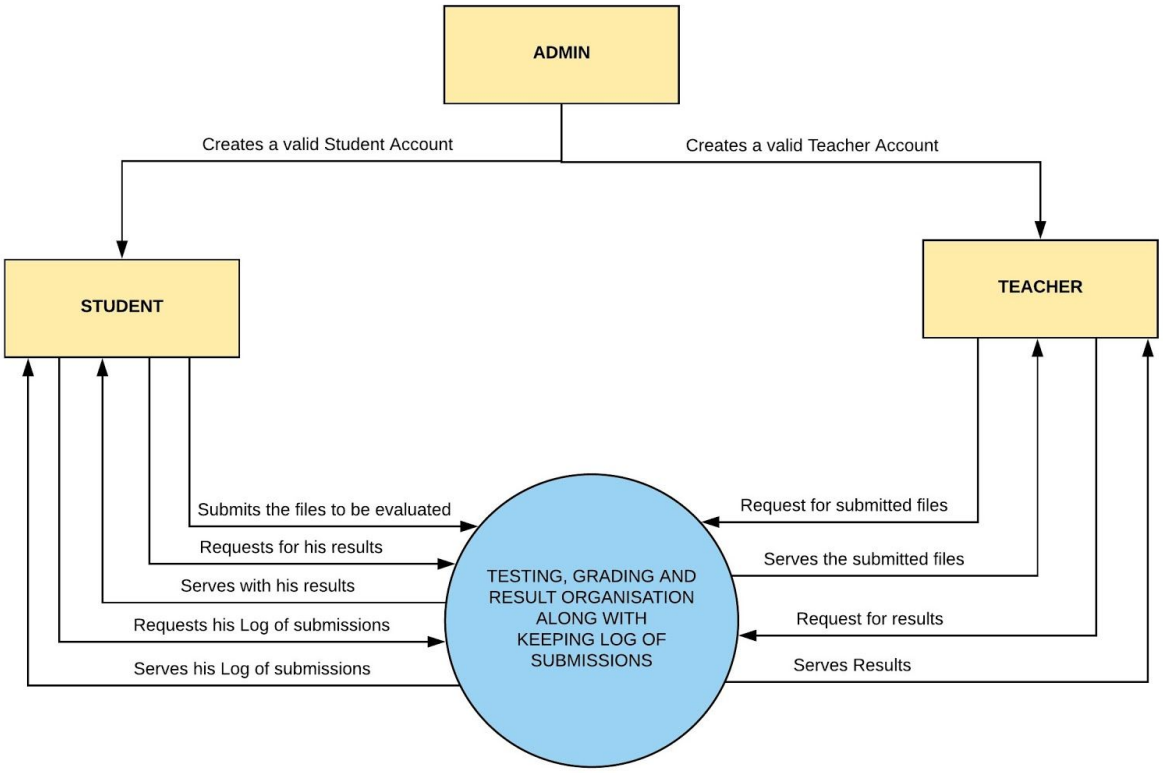
1. Context Diagram

1.1. Context Diagram

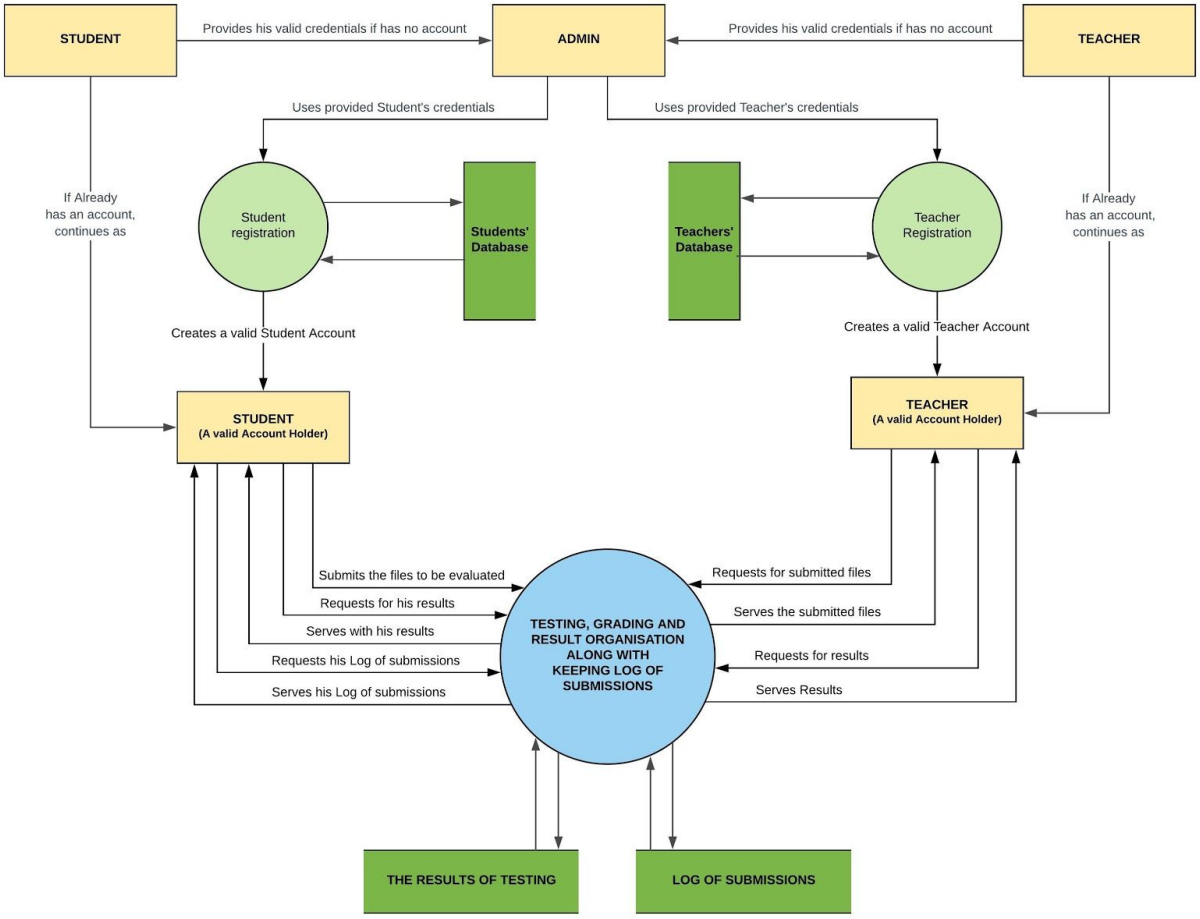


1.2. Description of the entire system

This software aims to automate the process of evaluating the programs written by the students in the lab, during the lab classes, surprise tests, mid-semester and end-semester examinations. In this system, the ADMIN has the ability to add STUDENTs and TEACHERs. During the evaluation process, the registered STUDENT submits his files to be tested and graded. He can submit multiple files too, a submission log of which is maintained. Once the grading is completed, the request for results(by the STUDENT) is served. The registered TEACHER can view all the submitted files and also see the results of the whole class.

2. Data Flow Diagrams

2.1 Data Flow Diagram:



2.2 List of Entities

This subsection contains the list of all the Entities of the System along with their description.

E.Id	Entity Name	Description
E01	ADMIN	He/she is the one who creates STUDENT and TEACHER accounts.
E02	TEACHER	He/she is the one who is responsible for evaluation. He/she can view the submitted files and the results for the whole class.
E03	STUDENT	He/she is the one who attends the test. He/she has to submit files for evaluation. He/she can view his submitted files and his evaluation results.

2.3 List of Data Stores

This subsection contains the list of all the Data Store of the System along with their description.

D.Id	Data Store Name	Description
D01	Student's Database	It stores the registered STUDENTs.
D02	Teacher's Database	It stores the registered TEACHERs.
D03	The Results of Testing	It stores the results of evaluation of all the students after testing in a structured manner.
D04	Log of Submissions	It stores a log of all the submissions made by all the students in a structured manner.

2.4. List of Processes

This subsection contains the list of all the Processes in the System along with their description.

P.Id	Process Name	Description
P01	Student Registration	In this process, the ADMIN creates a STUDENT account and that data is stored in “Student’s Database” data store
P02	Teacher registration	In this process, the ADMIN creates a TEACHER account and that data is stored in “Teacher’’s Database” data store
P03	Testing, Grading and Result organisation along with keeping log of submissions	In this process, the submitted files of STUDENT are evaluated and the results are stored in “The Results of Testing” data store and the log of submissions is maintained in “Log of Submissions” data store. This process also satisfies the requests for results by both TEACHER and STUDENT.

2.5. List of Data Flows

This subsection contains the list of all the Data Flows in the System along with their description.

DF.Id	Data Flow	Description
DF01	Provides his initial credentials if has no account	**Data source :** STUDENT or TEACHER **Data sink :** ADMIN **What’s the data about? :** This data provides certain essential credentials about the “Data source” which is necessary for his/her registration.
DF02	Uses provided credentials	**Data source :** ADMIN **Data sink :** Process “Student registration” or the process “Teacher’s registration”. **What’s the data about? :** This data contains information about the “Entity” whose registration is to be done.
		Data source : STUDENT

DF03	Submits the files to be evaluated	**Data sink :** The process “Testing, Grading and Result organisation along with keeping log of submissions”. **What’s the data about? :** This data contains the files that are to be tested and graded.
DF04	Requests for his results	**Data source :** STUDENT **Data sink :** The process “Testing, Grading and Result organisation along with keeping log of submissions”. **What’s the data about? :** Here the STUDENT asks for his results.
DF05	Serves with his results	**Data source :** The process “Testing, Grading and Result organisation along with keeping log of submissions”. **Data sink :** STUDENT **What’s the data about? :** This data contains the Results of “Data sink” obtained after the evaluation process has been completed.
DF06	Requests his Log of Submissions	**Data source :** STUDENT **Data sink :** The process “Testing, Grading and Result organisation along with keeping log of submissions”. **What’s the data about? :** Here the STUDENT asks for his Log of Submission.
DF07	Servers his Log of Submissions	**Data source :** The process “Testing, Grading and Result organisation along with keeping log of submissions”. **Data sink :** STUDENT **What’s the data about? :** This data contains the Log of Submission of the “Data sink”. The Log of Submissions contains the information about all the submissions made by the “Data sink” and the corresponding results obtained.
DF08	Requests for submitted files	**Data source :** TEACHER **Data sink :** The process “Testing, Grading and Result organisation along with keeping log of submissions”. **What’s the data about? :** Here the TEACHER requests for the submitted files of a particular STUDENT.
		Data source : The process “Testing, Grading and

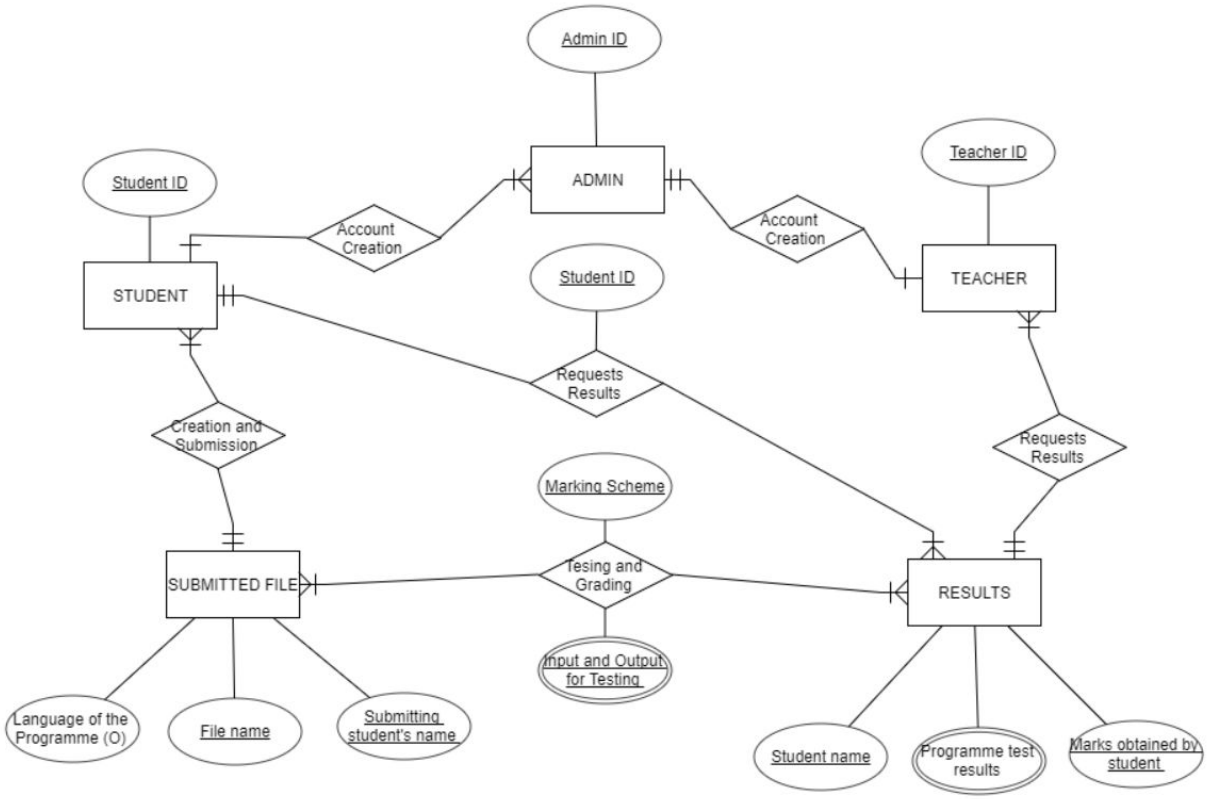
DF09	Serves the submitted files	Result organisation along with keeping log of submissions". **Data sink :** TEACHER **What's the data about? :** This data contains all the file submitted by a particular STUDENT, whose "Submitted files" had been requested for.
DF10	Requests for results	**Data source :** TEACHER **Data sink :** The process "Testing, Grading and Result organisation along with keeping log of submissions". **What's the data about? :** Here the TEACHER asks for the results of the whole class or that of a particular STUDENT.
DF11	Serves Results	**Data source :** The process "Testing, Grading and Result organisation along with keeping log of submissions". **Data sink :** TEACHER **Note :** Here the source and the sink are interchangeable depending upon the situation. **What's the data about? :** This data contains either the results of the whole class or that of a particular STUDENT depending upon the request made.
DF12	Data flow between the process 'Testing, Grading and Result organisation along with keeping log of submissions" and the Data Store "Results of testing"	**Data source :** The process "Testing, Grading and Result organisation along with keeping log of submissions" **Data sink :** The data store "Results of testing" **Note :** Here the source and the sink are interchangeable depending upon the situation(a two-way dataflow). **What's the data about? :** This data contains the information obtained after each evaluation process.
DF13	Data flow between the process 'Testing, Grading and Result organisation along with keeping log of submissions" and the Data Store "Log of Submissions"	**Data source :** The process "Testing, Grading and Result organisation along with keeping log of submissions". **Data sink :** The data store "Log of Submissions" **Note :** Here the source and the sink are interchangeable depending upon the situation(a two-way dataflow). **What's the data about? :** Each instance of this data contains the information about each

		submission made by a particular STUDENT.
DF14	Data flow between the process 'Student Registration" and the Data Store "Student's Database"	**Data source :** The process "Student registration" **Data sink :** The data store "Student's database" **Note :** Here the source and the sink are interchangeable depending upon the situation(a two-way dataflow). **What's the data about? :** Each instance of this data contains the necessary information about a particular STUDENT, which is essential for him/her to login.
DF15	Data flow between the process 'Teacher's registration" and the Data Store "Teacher's Database"	**Data source :** The process "Teacher's registration" **Data sink :** The data store "Teacher's database" **Note :** Here the source and the sink are interchangeable depending upon the situation(a two-way dataflow). **What's the data about? :** Each instance of this data contains the necessary information about a particular TEACHER, which is essential for him/her to login.

3. Entity Relationship Diagram

This section contains the Entity Relationship diagram describing the System. Here we have described all the Entities along with their Attributes. This section also includes the Entity Relationship represented using the Relational Model.

3.1. ER-Diagram



3.2. List of Entities and Attributes

ET.Id	Entity	Description	List of Attributes and type	
			Attributes	**Type**
ET01	ADMIN	ADMIN is recognised its unique “Admin Id”. He is responsible to create STUDENT and TEACHER accounts.	Admin Id	String
ET02	TEACHER	TEACHER is recognised by its unique “Teacher Id”. He is responsible for the evaluation process.	Teacher Id	String
ET03	STUDENT	STUDENT is recognised by its unique “Student Id”. He is the one attends the test. He submits his files for evaluation and requests for his results.	Student Id	String
ET04	SUBMITTED FILES	Each file is recognised by its unique “File name”. This is submitted by the STUDENT for evaluation. This file undergoes testing and the submitting STUDENT is graded accordingly.	Language of Programme	String
			File Name	String
			Submitting Student’s name	String
ET05	RESULTS	Results of each student, are uniquely identified by the associated “Student name”. Results are obtained after the submitted files are tested and graded.	Student’s name	String
			Programme test results	String
			Marks obtained by the Student	int

3.3. Relational Model

Relational Schemas of each entity :-

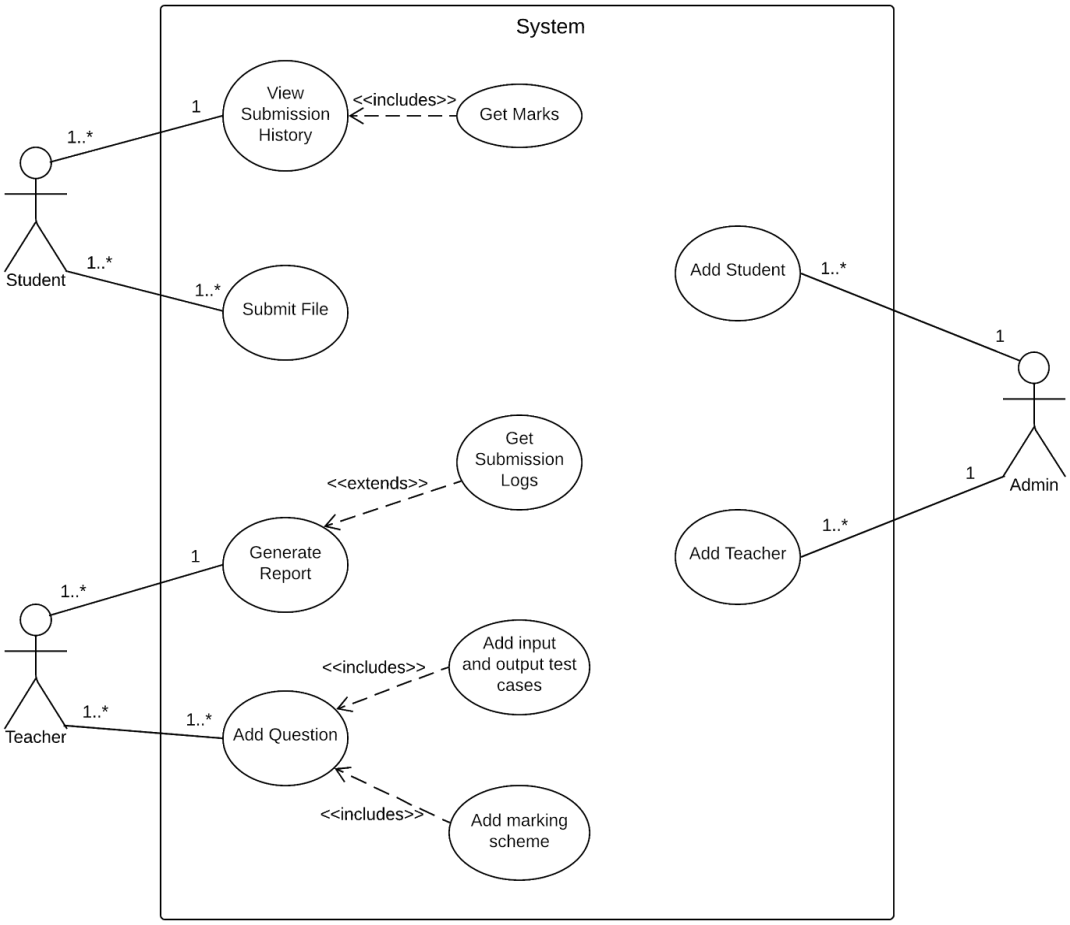
1. **ADMIN (**Admin Id**)**
2. **TEACHER (**Teacher Id**)**
3. **STUDENT (**Student Id**)**
4. **SUBMITTED FILES (**File name, Language of Programme, Submitting Student's name**)**

4. Use Case Diagram

This section contains the use case diagram, list of use cases, actors and associations.

4.1. Use case Diagram ID: UC-01 Main

Diagram



List of Use cases

This subsection contains a list of the use case names, along with their description, pre-conditions, and postconditions.

S.No	Use Case Name	Description	Pre-condition	Post-condition
1	View Submission History	Student can view all his/her submissions along with the code and marks obtained for each submission	Some files must have been submitted	Submission history is available
2	Submit Files	Student can submit his/her code.	File should be ready	File has been submitted and will be tested against the test cases
3	Get Marks	Student can view his/her marks obtained in each question	None	Student marks will be displayed
4	Add Question	Teacher can add the question description	None	Question added
5	Add Input and Output Test Cases	Teacher can add the test cases to a particular question	Question must have been added	Test cases will be added
6	Add Marking Scheme	Teacher can add the marking scheme, or weightage for each test case	Test cases must be present	Marking scheme will be updated
7	Generate Report	Teacher can generate and view marks of every student in a table format	None	Report is generated
8	Get Submission Logs	Teacher can view every student's submissions	At least one student must have submitted a file	Submission logs will be available
9	Add Student	Admin can register a new student	None	Student will registered
10	Add Teacher	Admin can register a new teacher	None	Teacher will be registered

List of Actors

This subsection contains a list of the actors, along with their description / actor's role.

S.No	Actor Name	Description / Actor's Role
1	Student	Student can submit codes, view his submissions and marks obtained
2	Teacher	Teacher can generate the report, and view all submissions made by every student. He/she can also add new questions, test cases and update marking scheme
3	Admin	Admin can add/register new students and teachers

List of Associations / Generalizations / Relationships (include or exclude)

This subsection contains a list of associations, along with the type(Association or Generalization or include or exclude).

S.No	Association	Type (Association or Generalization or include or exclude)	Description
1	Student to View Submission History	Association	Student can view submission history (Actor to Use Case)
2	Student to Submit File	Association	Student can submit files (Actor to Use Case)
3	Teacher to Generate Report	Association	Teacher can generating report of all students (Actor to Use Case)
4	Teacher to Add Question	Association	Teacher can add new questions (Actor to Use Case)
5	Admin to Add Student	Association	Admin can add new students (Actor to use case)
6	Admin to Add Teachers	Association	Admin can add new teachers (Actor to use case)

Summary

This report includes the following details of the project:

1. Context Diagram along with the description of the entire system.
2. Data Flow Diagram with its list of entities, data stores, processes, and data flows
3. Entity Relationship Diagram. This includes the list of entities and attributes, and relationship model
4. Use Case Diagram, along with its list of use cases, actors and associations.