STRUCTURED QUERY LANGUAGE (SQL)

What is SQL

SQL is Structured Query Language, which is a computer language for storing, manipulating and retrieving data stored in a relational database.

SQL is the standard language for Relational Database System. All the Relational Database Management Systems (RDBMS) like *MySQL, MS Access, Oracle, Sybase, Informix, Postgres and SQL Server* use SQL as their standard database language.

Also, they are using different dialects, such as:

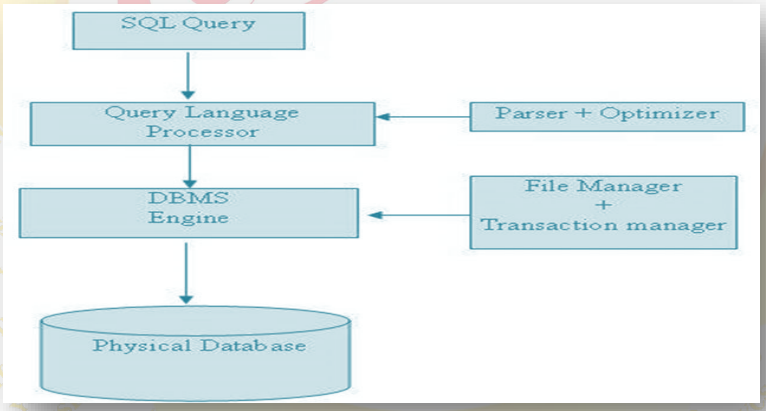
- ✓ MS SQL Server using T-SQL,
- ✓ Oracle using PL/SQL,
- ✓ MS Access version of SQL is called JET SQL (native format) etc.

Advantage of SQL

***SQL** is widely popular because it offers the following advantages:*

- ✓ Allows users to access data in the relational database management systems.
- ✓ Allows users to describe the data.
- ✓ Allows users to define the data in a database and manipulate that data.
- ✓ Allows to embed within other languages using SQL modules, libraries & pre-compilers.
- ✓ Allows users to create and drop databases and tables.
- ✓ Allows users to create view, stored procedure, functions in a database.
- ✓ Allows users to set permissions on tables, procedures and views.

SQL Architecture:



SQL Commands

The standard **SQL** commands to interact with relational databases are *CREATE, SELECT, INSERT, UPDATE, DELETE and DROP*. These commands can be classified into the following groups based on their nature:

DDL - Data Definition Language

Commands	Description
CREATE	Creates a new table, a view of a table, or other object in the database.
ALTER	Modifies an existing database object, such as a table.
DROP	Deletes an entire table, a view of a table or other objects in the database

DML - Data Manipulation Language

Command	Description
SELECT	Retrieves certain records from one or more tables.
INSERT	Creates a record.
UPDATE	Modifies records.
DELETE	Deletes records.

DCL – Data Control Language

Command	Description
GRANT	Gives a privilege to user.
REVOKE	Takes back privileges granted from user.

What is RDBMS

RDBMS stands for Relational Database Management System. RDBMS is the basis for SQL, and for all modern database systems like *MS SQL Server, IBM DB2, Oracle, MySQL, and Microsoft Access*.

A Relational database management system (RDBMS) is a database management system (DBMS) that is based on the relational model as introduced by **E. F. Codd.**

What Is A Table

The data in an **RDBMS** is stored in database objects which are called as tables. This table is basically a collection of related data entries and it consists of numerous columns and rows.

Remember, a table is the most common and simplest form of data storage in a relational database. The following program is an example of a **CUSTOMERS** table:

ID	NAME	AGE	ADDRESS	SALARY
1	Ramesh	32	Ahmedabad	2000.00
2	Khilan	25	Delhi	1500.00
3	kaushik	23	Kota	2000.00
4	Chaitali	25	Mumbai	6500.00
5	Hardik	27	Bhopal	8500.00
6	Komal	22	MP	4500.00
7	Muffy	24	Indore	10000.00

What Is A Field

Every table is broken up into smaller entities called fields. The fields in the CUSTOMERS table consist of **ID, NAME, AGE, ADDRESS and SALARY.**

ID	NAME	AGE	ADDRESS	SALARY

A field is a column in a table that is designed to maintain specific information about every record in the table.

What is a Record or a Row

A record is also called as a row of data is each individual entry that exists in a table. For example, there are 7 records in the above **CUSTOMERS** table. Following is a single row of data or record in the **CUSTOMERS** table:

ID	NAME	AGE	ADDRESS	SALARY
1	Ramesh	32	Ahmedabad	2000.00
2	Khilan	25	Delhi	1500.00
3	kaushik	23	Kota	2000.00
4	Chaitali	25	Mumbai	6500.00
5	Hardik	27	Bhopal	8500.00
6	Komal	22	MP	4500.00
7	Muffy	24	Indore	10000.00

What Is A Column

A column is a vertical entity in a table that contains all information associated with a specific field in a table.
For example, a column in the **CUSTOMERS** table is **ADDRESS**, which represents location description and would be as shown below:

ADDRESS
Ahmedabad
Delhi
Kota
Mumbai
Bhopal
MP
Indore

What Is A NULL Value

A **NULL value** in a table is a value in a field that appears to be blank, which means a field with a NULL value is a field with no value.

It is very important to understand that a NULL value is different than a zero value or a field that contains spaces. A field with a NULL value is the one that has been left blank during a record creation.

SQL Constraints

Following are some of the most commonly used constraints available in SQL:

NOT NULL Constraint: Ensures that a column cannot have a NULL value.

DEFAULT Constraint: Provides a default value for a column when none is specified.

UNIQUE Constraint: Ensures that all the values in a column are different.

PRIMARY Key: Uniquely identifies each row/record in a database table.

FOREIGN Key: Uniquely identifies a row/record in any another database table.

CHECK Constraint: The CHECK constraint ensures that all values in a column satisfy certain conditions.

INDEX: Used to create and retrieve data from the database very quickly.

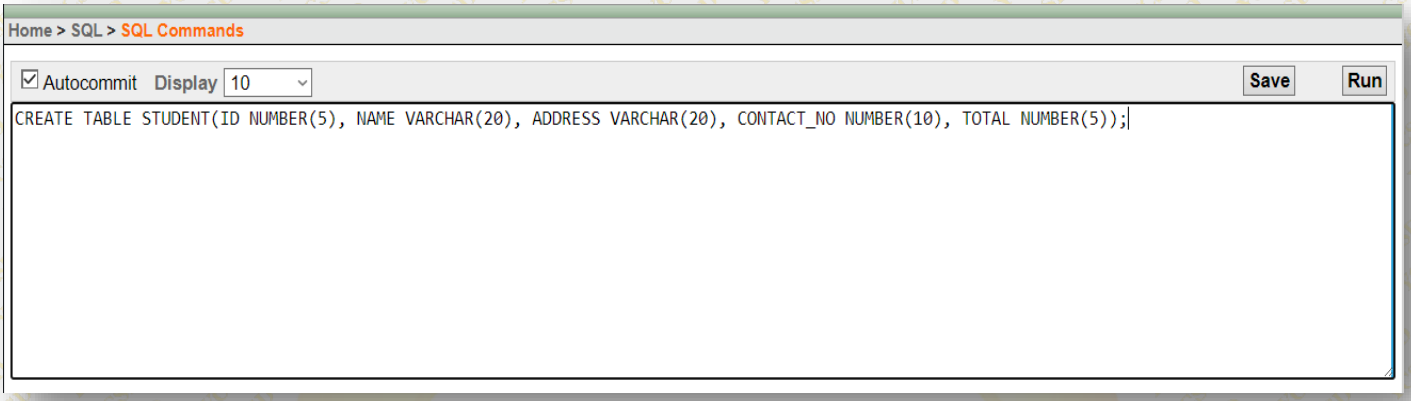
SQL Syntax

CREATE Statement: The **CREATE TABLE** statement is used to create a new table in a database.

SYNTAX

CREATE TABLE Table Name (Column1 Datatype, Column2 Datatype, Column3 Datatype,.....Column N Datatype, **PRIMARY KEY** (one or more columns));

EXAMPLE



DESC Statement: SQL **DESC** statement use for describe the list of column definitions for specified table. You can use either **DESC or DESCRIBE** statement.

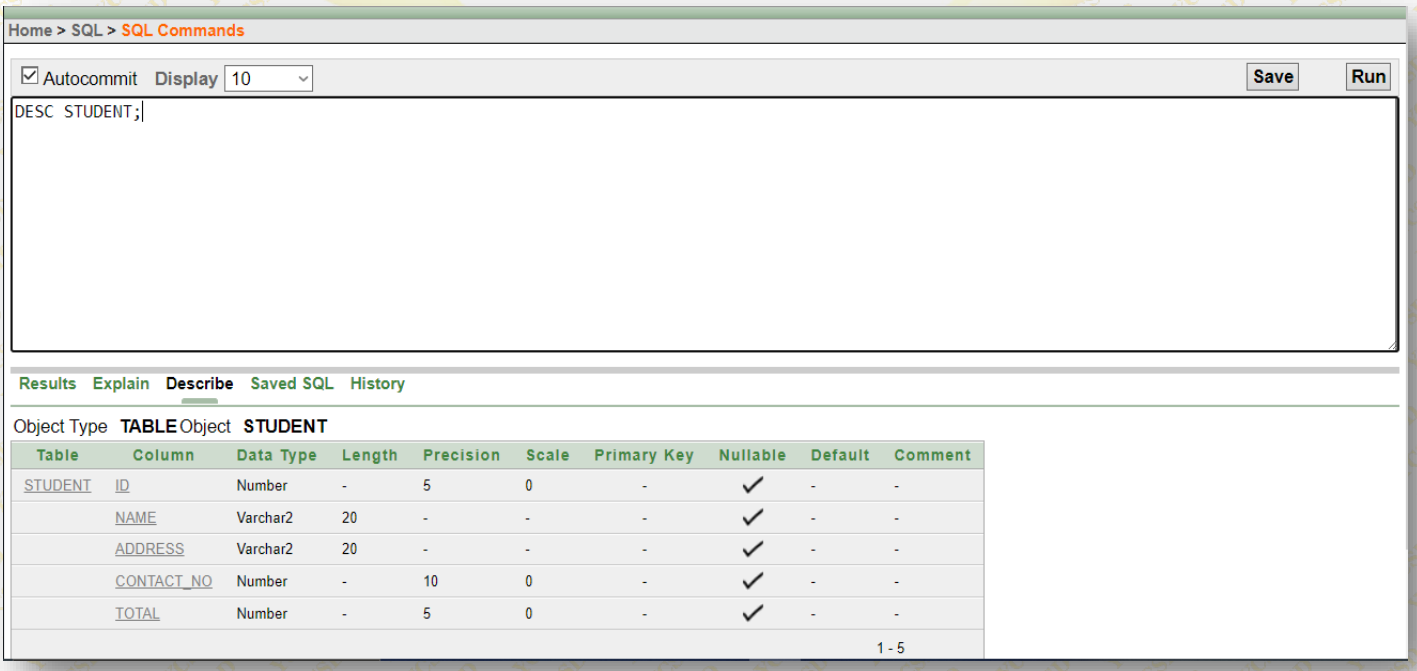
DESCRIBE Statement to Get Following Information:

- ✓ Column Name
- ✓ Column allow NULL or NOT NULL
- ✓ Datatype of the Column
- ✓ With database size precision and If NUMERIC datatype scale.

SYNTAX

DESC Table Name;

EXAMPLE

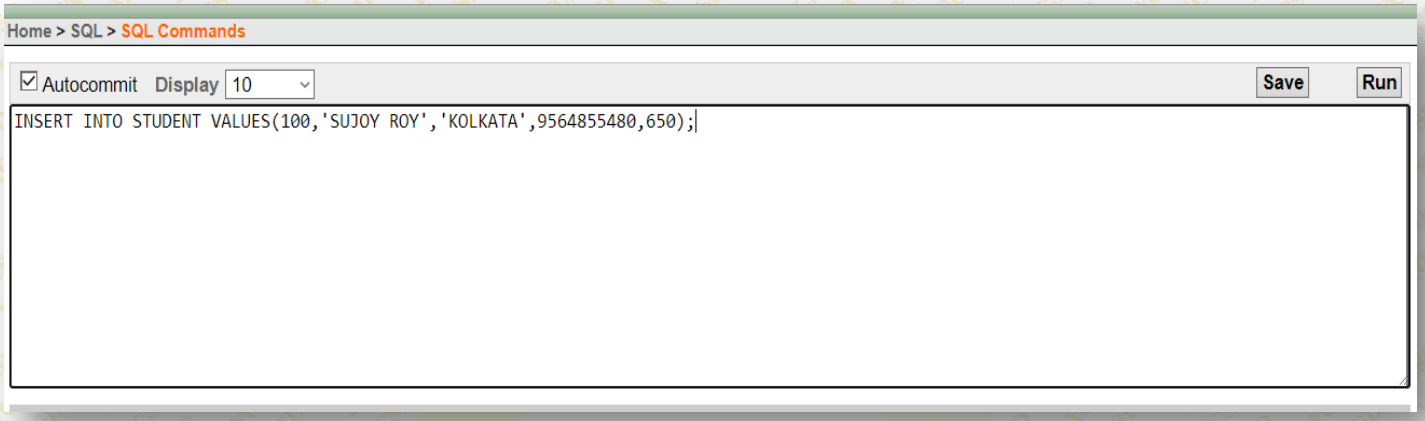


INSERT INTO Statement: The **INSERT INTO** statement is used to insert new records in a table.

SYNTAX

INSERT INTO Table Name (Column1, Column2……..Column N) **VALUES** (value1, value2…… value N);

EXAMPLE

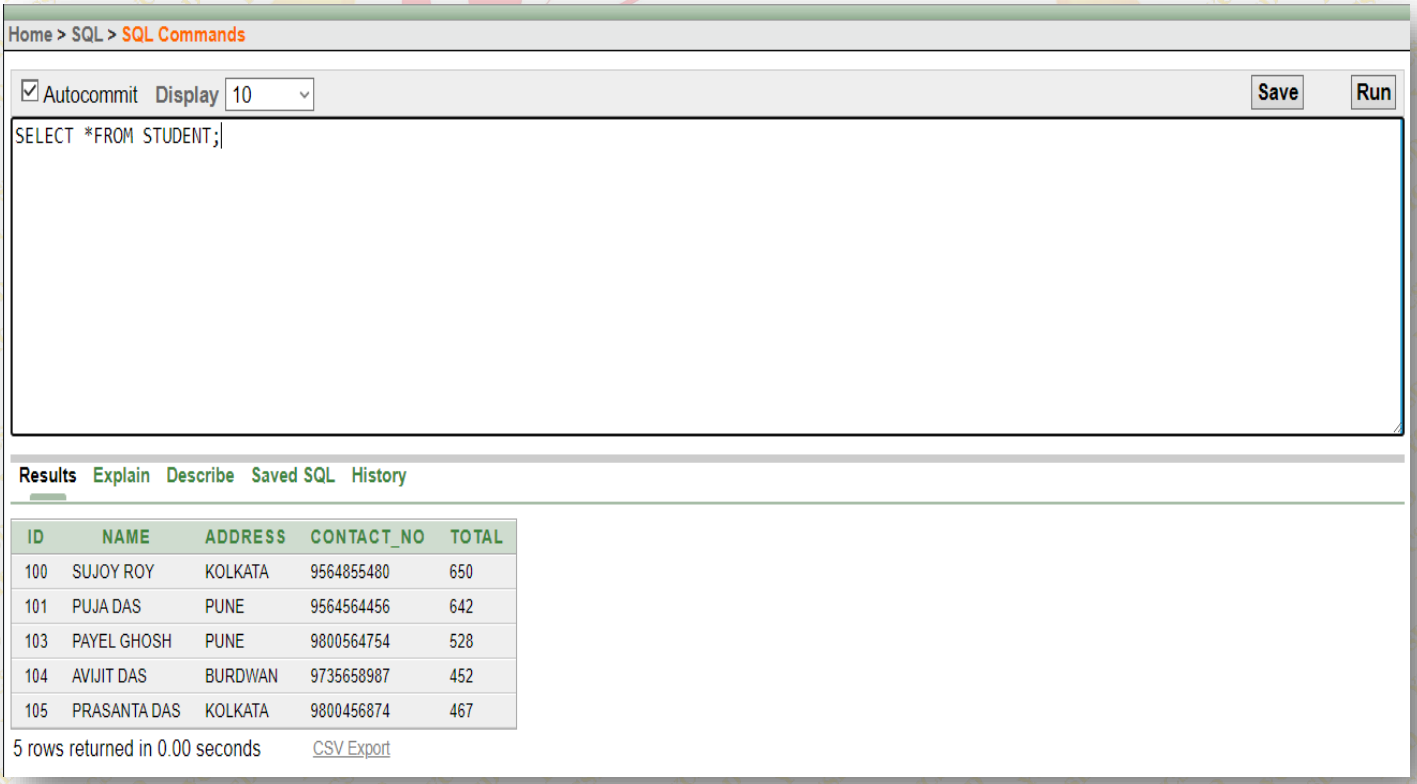


SELECT Statement: The **SELECT** statement is used to select data from a database.

SYNTAX

SELECT *FROM Table Name;

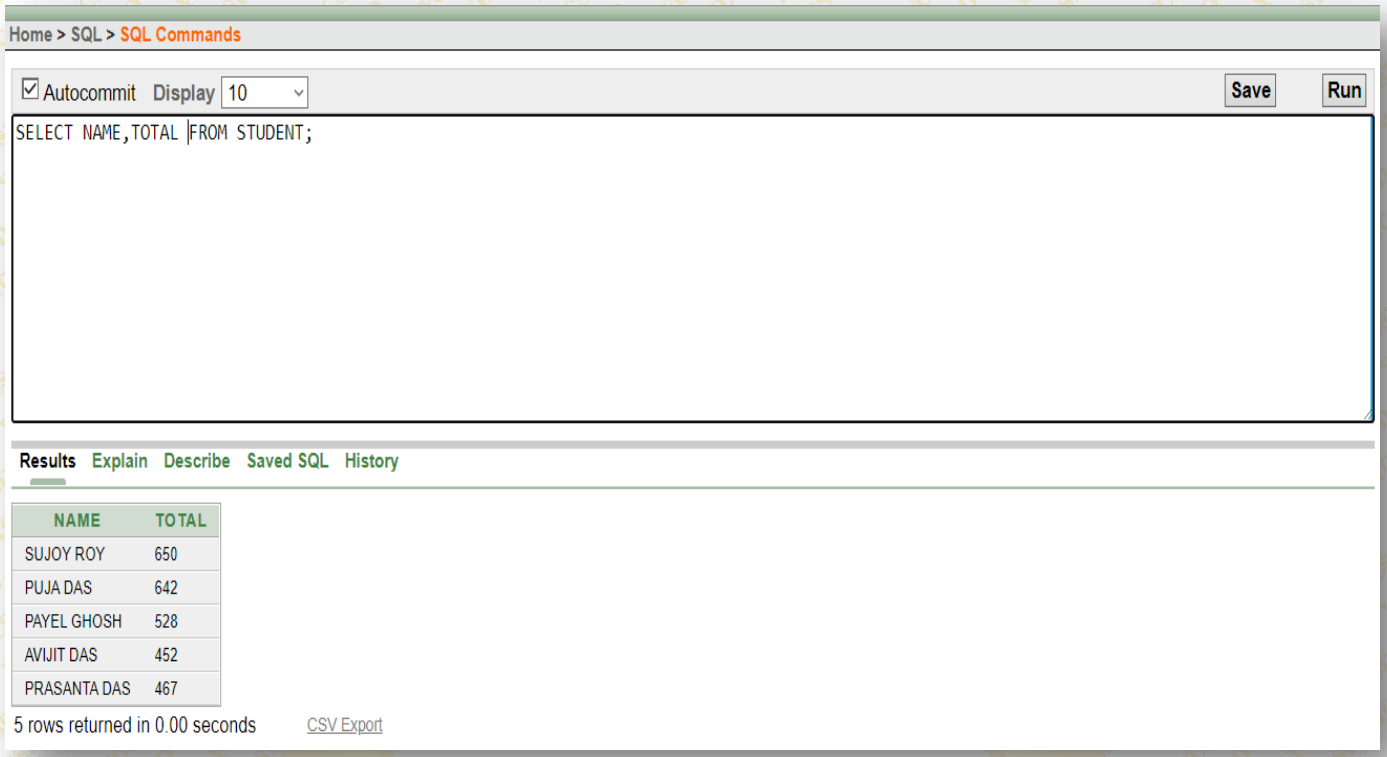
EXAMPLE



SYNTAX

SELECT Column1, Column2……. Column N **FROM** Table Name;

EXAMPLE

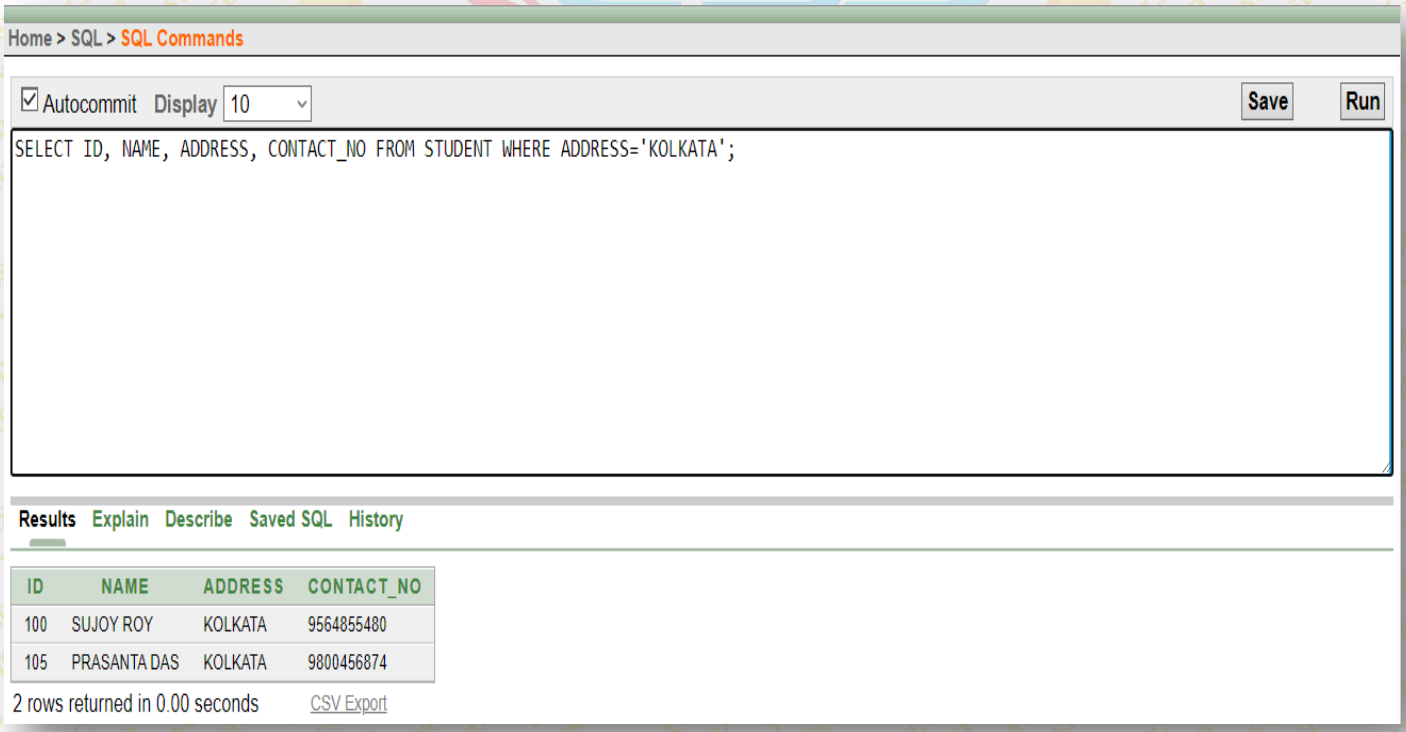


WHERE Clause: The WHERE clause is used to filter records. It is used to extract only those records that fulfill a specified condition.

SYNTAX

SELECT Column1, Column2……. Column N **FROM** Table Name **WHERE CONDITION;**

EXAMPLE



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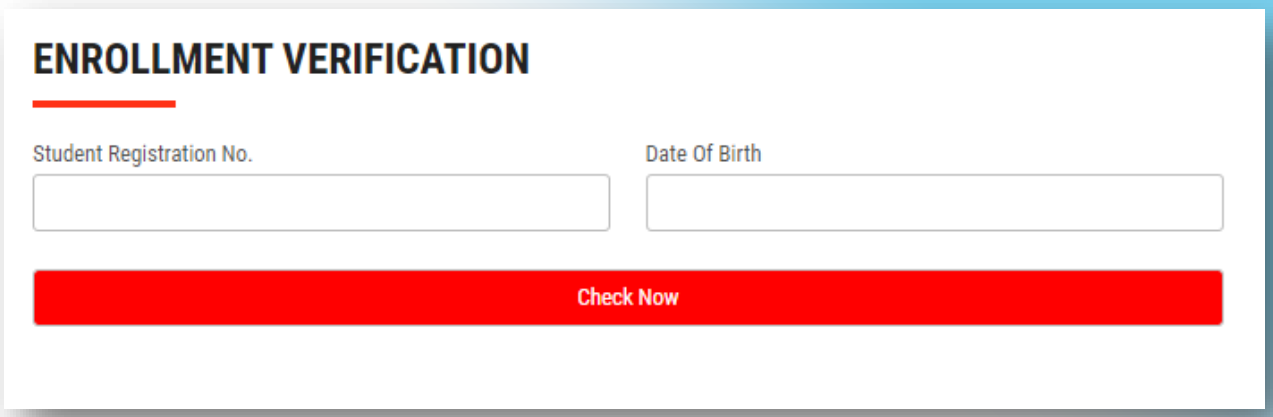

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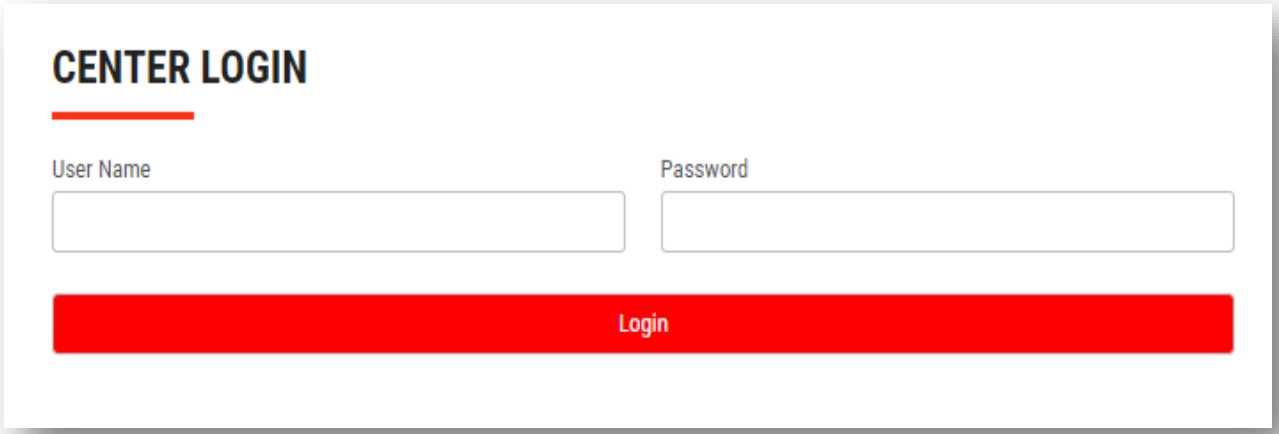

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