**Business Requirements Document (BRD) for Udemy-like Online Learning Platform**

**1. Introduction**

**1.1 Purpose**

The purpose of this document is to outline the business requirements for an online learning platform similar to Udemy. The platform will allow instructors to create and manage courses, students to enroll and track progress, and provide additional functionalities such as assessments, Q&A, notifications, and payments.

**1.2 Scope**

The system will include user management, course management, quizzes and assessments, student progress tracking, payments, Q&A, and notifications.

**2. Functional Requirements**

**2.1 User Management**

* Users can register and log in as **Students or Instructors**.
* User Emails must be verified.
* User attributes include:
  + Name, Email, Password, Gender, Age, Address (City, State, Country), Social Media Links.
* **Instructors** have additional attributes:
  + Title, Bio, Total Courses, Total Reviews, Total Students, Social Links.
* **Role-Based Access Control (RBAC):**
  + Admin: Manage users, courses, and system settings.
  + Instructor: Create and manage courses, and respond to Q&A.
  + Student: Enroll in courses, track progress, participate in assessments, and ask questions and respond in the Q&A section.

**2.2 Course Management**

* Instructors can create and manage courses with the following attributes:
  + Title, Description, Price, Status (Draft, Published), Duration, Language, Discount, Level (Beginner, Intermediate, Advanced), Number of Subscriptions.
* Each Course consists of Sections.
* Each Section has (Title, Duration, Number of Lessons) and contains Lessons of different types:
  + **Video:** Hosted via external links.
  + **Article:** Text-based content, external content.

**2.3 Quiz and Assessment System**

* Instructors can create Quizzes for a specific course with multiple Questions.
* Question attributes:
  + Question Type (Multiple Choice, True/False), Question Text, Answer Choices.
* Students can take quizzes and receive grades.

**2.4 Student Enrollment and Progress Tracking**

* Students can enroll in courses.
* The system tracks:
  + Course Completion, Start Date, End Date, Progress Percentage.
* Students can Rate and Review courses.

**2.5 Payment and Orders**

* Students can purchase courses via an Order System.
* Order attributes:
  + Order ID, Payment Method, Order Date, Total Amount, Discount.
* Integration with payment gateways for secure transactions.

**2.6 Q&A and Interaction**

* Students can ask questions about a course.
* Instructors and other students can respond to questions.
* Attributes include:
  + Question Text, Answer Text.

**2.7 Notifications**

* The system will send notifications for:
  + Course Updates, New Enrollments, Q&A Interactions.
* Notifications can be delivered via:
  + In-App Alert.

**2.8 Certification**

* When students finish the complete course, they will receive a certification for that course.
* If the course has a quiz, the student must first complete the quiz before issuing a certification.

**3. Database Design**

**3.1 Database Dictionary**

**3.1.1 Course Table**

* **Description:** Stores information about the Courses.
* **Attributes:**
  + **updateDate:** The date when the course information was last updated.
  + **crs\_id (PK):** Unique identifier for each course.
  + **description:** A brief description of the course content.
  + **creationDate:** The date when the course was created.
  + **price:** The cost of enrolling in the course.
  + **status:** The current status of the course (e.g., active, inactive).
  + **duration:** The length of time the course runs.
  + **name:** The name of the course.
  + **language:** The language in which the course is taught.
  + **discount:** Any discount available for the course.
  + **level:** The difficulty level of the course (e.g., beginner, intermediate, advanced).
  + **Vid\_url:** The URL links for educational videos.
  + **img\_url:** The images URL links for courses.

**3.1.2 Section Table**

* **Description:** Contains details about the course sections.
* **Attributes:**
  + **SectionID (PK):** Unique identifier for each section.
  + **Title:** Name of the section.
  + **Duration:** Total duration of the section.
  + **No\_Lessons:** Number of lessons included in the section.

**3.1.3 Lessons Table**

* **Description:** Contains details about the course sections.
* **Attributes:**
  + **LessonID (PK):** Unique identifier for each Lesson.
  + **Title:** Name of the lesson.
  + **Duration:** Total duration of the lesson.
  + **Type:** Type of lesson (article, video, etc.).
  + **url:** The section URL.
  + **article content:** The content of lessons.

**3.1.4 Subcategory Table**

* **Description:** Contains details about subcategories.
* **Attributes:**
  + **ID (PK):** Unique identifier for each subcategory.
  + **Sub\_name:** Name of the subcategory.

**3.1.5 Category Table**

* **Description:** Contains details about categories.
* **Attributes:**
  + **ID (PK):** Unique identifier for each category.
  + **Cat\_name:** Name of the category.

**3.1.6 User Table**

* **Description:** Contains details about admin users.
* **Attributes:**
  + **ID (PK):** Unique identifier for each user.
  + **Name:** Name of the user.
  + **Email:** Email address of the user.
  + **Password:** Password for user authentication.
  + **RoleID (FK):** Identifier linking to the user's role.

**3.1.7 Role Table**

* **Description:** Contains details about admin user roles.
* **Attributes:**
  + **RoleID (PK):** Unique identifier for each role.
  + **RoleName:** Name of the role.

**3.1.8 Instructor Table**

* **Description:** Contains details about instructors.
* **Attributes:**
  + **ID (PK):** Unique identifier for each instructor.
  + **Title:** Title or designation of the instructor.
  + **Bio:** Biography or description of the instructor.
  + **SocialMedia:** Social media links of the instructor.
  + **TotalCourses:** Total number of courses taught by the instructor.
  + **TotalReviews:** Total number of reviews received by the instructor.
  + **TotalStudents:** Total number of students taught by the instructor.

**3.1.9 Student Table**

* **Description:** Contains details about students.
* **Attributes:**
  + **RoleID (PK):** Unique identifier for each student.
  + **UserID (FK):** Identifier linking to the user profile.
  + **bio:** Details about the student.
  + **Title:** Student job title or preferred title.
  + **Social\_media:** URLs for student social media.
  + **Country\_name:** Current student country.
  + **City:** Current student city.
  + **State:** Current student state.

**3.1.10 Location Table**

* **Description:** Contains details about geographical locations.
* **Attributes:**
  + **CountryName:** Name of the country.
  + **State:** Name of the state.
  + **City:** Name of the city.

**3.1.11 Certificate Table**

* **Description:** Contains details about certifications.
* **Attributes:**
  + **CertifyID (PK):** Unique identifier for each certification.
  + **Certification\_url:** URL for each certification.

**3.1.12 Enroll Table**

* **Description:** Contains details about enrollment for courses per student.
* **Attributes:**
  + **Enroll\_id (PK):** Unique identifier for each enroll.
  + **Completion\_data:** Date when students completed the course.
  + **Start\_data:** Date when students started the course.
  + **progress:** Percentage showing progress of each course.

**3.1.13 Cart Table**

* **Description:** Contains details about the student's cart.
* **Attributes:**
  + **ID (PK):** Unique identifier for each Cart.
  + **amount:** Number of courses in the cart.
  + **lastmodified:** Last date the cart gets modified.
  + **datecreated:** First date the cart gets modified.

**3.1.14 Rate Table**

* **Description:** Contains details about the rate for each course.
* **Attributes:**
  + **(st\_id(FK), course\_id(FK)) (PK)**
  + **st\_id (FK):** Foreign identifier for student.
  + **course\_id(FK):** Foreign identifier for course.
  + **Comment:** Writing a comment on the course.
  + **Rating:** Rate the course from 1 to 10.

**3.1.15 Order Table**

* **Description:** Contains details about the rate for each course.
* **Attributes:**
  + **Order\_id (PK):** Unique identifier for each order.
  + **Payment\_method:** How users can pay for courses.
  + **Order\_date:** The date when the user orders.
  + **Status:** First date the cart gets modified.
  + **total\_amount:** Total amount of courses.
  + **discount:** If the course has a discount.

**3.1.16 Quiz Table**

* **Description:** Contains details about each quiz available for courses.
* **Attributes:**
  + **Quiz\_id (PK):** Unique identifier for each quiz.
  + **Title:** The title or name of the quiz.
  + **Course\_id (FK):** Identifier linking the quiz to a specific course.
  + **Created\_date:** The date when the quiz was created.
  + **Status:** Indicates whether the quiz is active, inactive, or draft.

**3.1.17 Question Table**

* **Description:** Contains the questions associated with each quiz.
* **Attributes:**
  + **Question\_id (PK):** Unique identifier for each question.
  + **Quiz\_id (FK):** Identifier linking the question to a specific quiz.
  + **Question\_txt:** The text of the question.
  + **Question\_type:** The type of question (e.g., multiple-choice, true/false, short answer).
  + **Options:** Possible answers for the question (if applicable).
  + **ans\_txt:** The correct answer to the question.

**3.1.18 Goals Table**

* **Description:** Contains details about the goals set by the course.
* **Attributes:**
  + **Goal\_id (PK):** Unique identifier for each goal.
  + **Title:** The title or name of the goal.
  + **Content:** Detailed description or content of the goal.
  + **crs\_id (FK):** Identifier linking the goal to a specific course.

**4. Project Phases Overview**

**4.1 Creation of Database Metadata using SSMS**

**4.2 Database Creation using web scraping and data generation tools (e.g., llama AI).**

**4.3 Data warehouse implementation using SSIS.**

**4.4 Dashboarding using Tableau, Power BI, and Excel.**

**4.5 Web page integration with the .NET team.**

**5. Stored Procedures**

**5.1 Courses by Year Procedure**

* Retrieves course details, including the creation date, course ID, name, and price, for courses created between a specified start and end date.

**5.2 Instructor Courses by Country**

* Retrieves course data, showing each instructor's country, name, course creation date, course ID, and the corresponding course price.

**5.3 Courses by Category**

* Retrieves the total revenue generated for each course in a specified category and year.

**5.4 Student Progress by Course**

* Retrieves the progress of students enrolled in a specific course, including their names, enrollment dates, and progress percentages.

**5.5 Courses in Cart by Student**

* Retrieves the courses currently in a student's cart, including the course name, price, and the last modified date of the cart.

**5.6 Top Rated Courses by Year**

* Retrieves the top-rated courses for a specified year, including the course name, average rating, and total number of reviews.

**5.7 Enrollment Trends by Year**

* Retrieves the total number of enrollments for each year, useful for analyzing enrollment trends.

**6. Entity Relationship Diagram (ERD)**

* The ERD will illustrate the relationships between the various tables in the database, including Users, Courses, Sections, Lessons, Quizzes, and more.

**7. Views**

**7.1 Students and Instructors by City**

**7.2 Alphabetical List of Courses**

**7.3 Current Course List**

**7.4 Enrollment Count by Course**

**7.5 Courses Above Average Price**

**7.6 Courses by Category**

**7.7 Top Rated Courses**

**7.8 Student Progress by Course**

**7.9 Revenue by Course**

**7.10 Discounted Courses**

**7.11 Instructors by Total Student**

**8. Data Warehouse Techniques and ETL Tools**

* We will create a Data Warehouse to complete the ETL process to convert from an OLTP system into an OLAP system.
* Integration using SSIS to create an OLAP system on-premises.

**9. Reporting and Dashboarding**

**9.1 Power BI Dashboard**

* Comprehensive dashboards with more than 20+ pages to visualize the data.
* Major dashboards include:
  + Overview of the dataset.
  + Profit Analysis by Multiple Dimensions.
  + Customer (Student) Analysis.
  + Employee (Instructor) Analysis.
  + Course Analysis.
  + Sales and Revenue Analysis.
  + Geographical Analysis.

**9.2 Tableau Dashboard**

* Course Overview.
* Student Enrollment.
* Instructor Performance.
* Course Ratings and Reviews.
* Sales and Revenue.
* Course Progress.

**9.3 Excel Dashboard**

* Sales Overview.
* Order Analysis.
* Student Insights.
* Discount Analysis.

**9.4 Python Data Analysis using (matplotlib, Pandas, Seaborn)**

* Provide a Notebook using Pandas, matplotlib, and seaborn for data analysis using Python.

**10. Full Recommendation Based on the Data**

* We will provide complete recommendations based on the insights extracted from the data.

**11. Documentation and Presentation**

* We will create full documentation for the project and provide a presentation file (.pptx).

**12. Assumptions & Constraints**

* Users must have a valid email address for registration.
* Administrators must approve courses before publication.

**13. Future Enhancements**

* In-App messaging.
* Instructors and Admin can create coupons for discounts.
* Integration with third-party payment systems like Stripe.