## User Model

{

\_id: ObjectId,

username: String, // username of the user

password: String, // hashed password by bcrypt

email: String, // user's email address (no need to verify)

group: String, // group of the user (could be enum instead of string)

profilePicture: String, // url of the image file

badges: [String], // badges of achievement idk if it’s string or images but it’s array

activities: [{ // recent activites embedded from activity model

type: String, // type of activity post Q&A or post Assignment or comment or like

description: String, // description of the activity (optional)

date: Date // date of activity

}],

recentNotes: [String], // Personal notes

isInstructor: Boolean // is user instructor?

}

## Courses Model

{

\_id: ObjectId,

courseName: String, // name of the course

description: String, // description of the course (optional)

instructorId: ObjectId, // reference of the instructor from use model isInst must be T

students: [ObjectId], // list of the enrolled students referenced to user model

chats: ObjectId, // ref to the chats of the chat messages model of this course

qAndA: [ObjectId], // ref to Q&A posts

announcements: [ObjectId], // ref to announcements

assignments: [ObjectId], // ref to assignments

materials: [ObjectId], // ref to course materials model

leaderboard: ObjectId // reference to the leaderboard of this course

}

## ChatMessage Model

{

\_id: ObjectId,

courseId: ObjectId, // ref to the course

senderId: ObjectId, // ref to the user who sent the message

message: String, // chat message content

timestamp: Date, // timestamp of when the message was sent

// **optional**

replies: [{ // op replies to messages

userId: ObjectId, // ref to the user replying

message: String, // the reply message

timestamp: Date

}],

editedAt: Date, // opt if the message was edited

deleted: Boolean // message deleted

// **optional**

}

## QAPost Model

{

\_id: ObjectId,

courseId: ObjectId, // ref to the course

posterId: ObjectId, // user who posted the question

content: String, // the question or discussion content

likes: [ObjectId], // list of user IDs who liked the post

comments: [ObjectId], // ref to comments of the post

createdAt: Date, // date of post creation

verifiedBy: ObjectId // id of the user who verified the solution

}

## Announcement Model

{

\_id: ObjectId,

courseId: ObjectId, // ref to the course

title: String, // title of the announcement

body: String, // the announcement content

postedBy: ObjectId, // instructor who posted the announcement

timestamp: Date // when the announcement was made

}

## Assignment Model

{

\_id: ObjectId,

courseId: ObjectId, // ref to the course

title: String, // title of the assignment

description: String, // des of the assignment

dueDate: Date, // deadline for submission

submissions: [ObjectId], // ref to submissions made by students

}

## Material Model

{

\_id: ObjectId,

courseId: ObjectId, // ref to the course

folder: String, // folder name

files: [{ // list of files in the folder

fileName: String, // name of the file

fileUrl: String, // file url or binary data

uploadedAt: Date // when the file was uploaded

}]

}

## Comment Model

{

\_id: ObjectId,

userId: ObjectId, // ref to the user who commented

postId: ObjectId, // ref to the Q&A post or chat message

content: String, // the comment content

timestamp: Date, // when the comment was made

verified: Boolean // If it's a verified solution (for Q&A)

}

## Submission Model

{

\_id: ObjectId,

assignmentId: ObjectId, // ref to the assignment

studentId: ObjectId, // ref to the student

files: [{ // list of submitted files

fileName: String,

fileUrl: String

}],

submittedAt: Date, // timestamp of submission

}

## Leaderboard Model

{

\_id: ObjectId,

courseId: ObjectId, // ref to the course

studentid: ObjectId, // ref to the student

points: int , // the total points for a student in specific course

badges: [{ // badges awarded to students

userId: ObjectId, // user reference

badge: String // badge type

}]

}

## Activity Model (Optional)

{

\_id: ObjectId,

userId: ObjectId, // ref to the user

type: String, // activity type

description: String, // details about the activity

date: Date // when the activity happened?

}