Minecraft

ENTITIES:

1. **Player** (username, email, user credentials, skin, XP)
   ISA (overlapping, partial):
   - **Host**
   - **Participant**
2. **World** (join code, seed, wname, difficulty, settings)
3. **Achievement** (aname, date received, progress)
4. **Mob** (mid, mname, position, max health, movement speed, current health, mtexture)
5. **Recipe** (rname, resulting Block, ordered list of ingredient Blocks)
6. **Inventory** (iid, remaining slots, maximum slots)
7. **Block** (block id, bname, type)
   ISA (disjoint, total):
   - **Inventory Item** (thumbnail, stacking capacity)
   - **Placed Block** (texture, block physics)
8. **Server** (IP address, name, player capacity)

RELATIONSHIPS:

1. "**Achieve**" Player → Achievement (many-to-many)
2. "**Craft**" Recipe → Inventory Item (one-to-one)
   - Participation Constraint: Recipe must "Craft" one block
3. "**Open**" Server→World (one-to-many)
   - Participation Constraint: Server must "Open" at least one World
4. "**Host**" Host→"Open" (hpermissions) (one-to-many) (AGGREGATION of Host to Server-World relationship "Open")
   - Participation Constraint: "Open" must be "Hosted" by at least one Host
5. "**Play**" Player → World (start time, end time) (many-to-one)
6. "**Save**" Player → World (one-to-many)
   - Participation Constraint: World must be "Saved" by at least one Player
7. "**Build**" Placed Block → Mob → World (many-to-many-to-many) (TERNARY)
8. "**Join**" Participant → Server (ppermissions) (many-to-many)
9. "**Store"** Inventory → Inventory Item (many-to-many)
10. "**Has**" Player → Inventory (one-to-one)
    - Participation Constraint: Inventory must be "Had" by at least one Player

What is the domain of the application?
The domain of this application includes game resource management and achievement tracking.

What aspects of the domain are modeled by the database?
This database models the resources, such as blocks, and achievements that a Minecraft player may have as part of their in-game inventory or profile. It also models how the quantity of these resources may change over time, as the player plays in a world or uses recipes to craft new

items. A world itself may also be part of a larger server, which is hosted by other players and can be played in by multiple players.

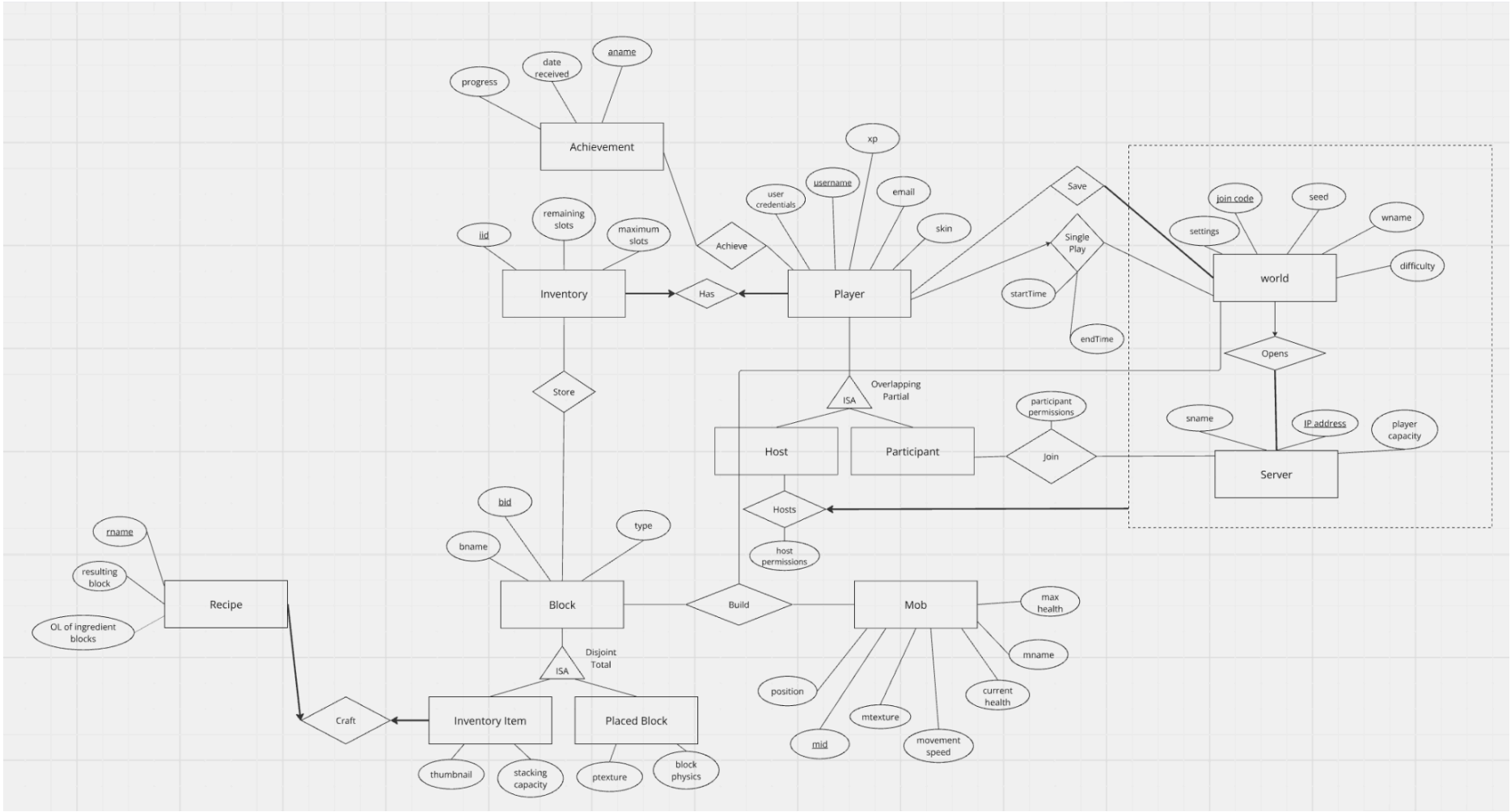
Database specifications?
This database allows users to monitor the resources in their inventory, craft new blocks, and build new worlds that consist of blocks and mobs. This database also models the multiplayer system in Minecraft, so players can join existing worlds, host servers that contain multiple worlds, as well as join existing servers. Finally, this database models the player's profile, which has achievements resulting from in-game events and a main menu that houses saved worlds and servers.

ER Diagram
See last page.

AI acknowledgement (if applicable)
ChatGPT was used to get some preliminary ideas of what could be modeled as Entities in the database, as well as for clarifying questions regarding Minecraft.

Prompts Given:
Are seeds unique for each world instance in minecraft?
So the seed basically allows someone to generate a duplicate of the world?
But we would not exist in the same instance of a world?
If you share the seed with your friend, and they build things in their copy of the world, then do those things also get built in my world?
If you and another person are on the same minecraft server, can you play in different worlds? Or does the server essentially put you in the same instance of a world?
Is it possible to be in the same world instance, if you and another person are on different servers?
In one server, does the seed identify unique world INSTANCES?
Can join codes be reused for different worlds in minecraft?
Is joining a world the same as joining a server?
Do passive mobs have damage level?
Does a join code exist for servers on minecraft?
What is the difference in joining a private or public server in minecraft
Do they have maximum player capacity

ER Diagram


aname
date received
progress
Achievement
xp
username
email
user credentials
skin
Achieve
remaining slots
maximum slots
iid
Inventory
Has
Player
Save
Single Play
startTime
endTime
join code
seed
wname
settings
world
difficulty
Opens
Store
ISA
Overlapping Partial
participant permissions
Host
Participant
Join
sname
IP address
player capacity
Server
Hosts
host permissions
bid
type
bname
rname
resulting block
OL of ingredient blocks
Recipe
Block
Build
Mob
max health
mname
current health
position
mtexture
mid
movement speed
Disjoint Total
ISA
Craft
Inventory Item
Placed Block
thumbnail
stacking capacity
ptexture
block physics