Training Arena design:

The **training** **arena** is designed as a **150x150x100 (x,z,y) arena** segmented into **sub** **regions** specialized in training the agent in different mechanics of Minecraft. The agents are spawned in the middle, thus being an equal distance to all sub regions.

**Subregions**:

• Bottom Right Square (0,0) (50,50) – “**Zoo**” – area designated for spawning friendly and hostile entities such as animals and zombies. The area is surrounded by a wall, not allowing the entities inside to leave the square.

• Bottom Left Square (100,0) (150,50) – “**Cliff**” – training the agent in climbing to higher positions

• Middle Left Square (100,50) (150,100) – “**Bridge**” – training the agent in crossing gaps of different lengths

• Top Left Square (100,100) (150,150) – “**Fall**” – training the agent in reaching lower positions without taking fall damage

• Top Middle + Top Right + Middle Right Squares will be utilized for **Building** training + **Material** **Collecting**/**Gathering**. (Collecting – acquiring from a chest for example, Gathering – by mining blocks)

**Helper functions implemented:**

• *calculate distance (agent1, agent2)* – calculates the distance between agents in the (X,Z) plane

• *generate\_line (blocktype, start\_pos, end\_pos)* - builds a line of blocks between start\_pos and end\_pos

*• generate\_cube(blocktype, start\_pos, end\_pos)* – build a cube of blocks between start\_pos and end\_pos being opposite corners of a cuboid

• *generate\_zoo/cliff/fall/bridge* – generate the corresponding square of the arena in **XML**

• *get\_bot (players) get\_player (players)* – given the *JSON* that is retrieved by **<ObservationFromNearbyEntities>**, retrieves the bot object and the player object named “Lightside” (if existing) correspondingly