Problem Statement 1: Game Insights with Aggregation (Aggregation Framework):

Objective: Leverage the Aggregation Framework to analyze game data and generate insights.

Task:

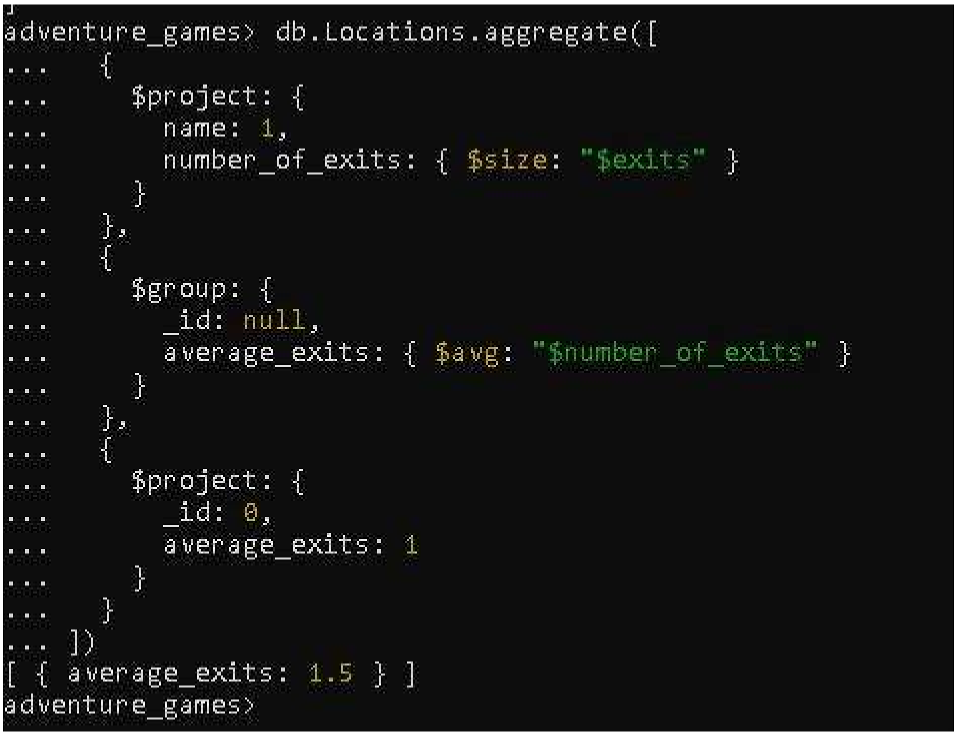
• Utilize the Aggregation Framework to perform data manipulation and analysis within your game:

✓ Count the total number of locations in your game world.

adventure_games> db.Locations.aggregate({$count:'Locations'})

[{ Locations: 4 }]

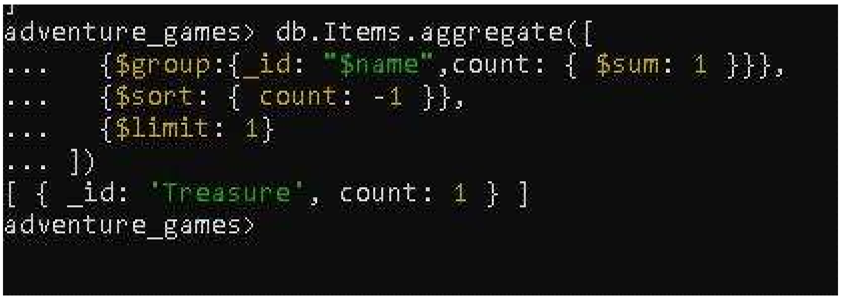
✓ Calculate the average number of exits per location.



```
adventure_games> db.Locations.aggregate([
...   {
...     $project: {
...       name: 1,
...       number_of_exits: { $size: "$exits" }
...     }
...   },
...   {
...     $group: {
...       _id: null,
...       average_exits: { $avg: "$number_of_exits" }
...     }
...   },
...   {
...     $project: {
...       _id: 0,
...       average_exits: 1
...     }
...   }
... ])
[ { average_exits: 1.5 } ]
adventure_games>
```

✓ Identify the most prevalent item type (e.g., weapons, potions) using aggregation

pipelines.



```
]
adventure_games> db.Items.aggregate([
...    {$group:{_id: "$name",count: { $sum: 1 }}},
...    {$sort: { count: -1 }},
...    {$limit: 1}
... ])
[ { _id: 'Treasure', count: 1 } ]
adventure_games>
```

Problem Statement 2: Speedy Navigation with Indexing:

Objective: Implement indexing strategies to optimize query performance in your game.

Task:

• Identify frequently used query fields in your game (e.g., location names, item types).

• Create indexes on these fields within the relevant collections.

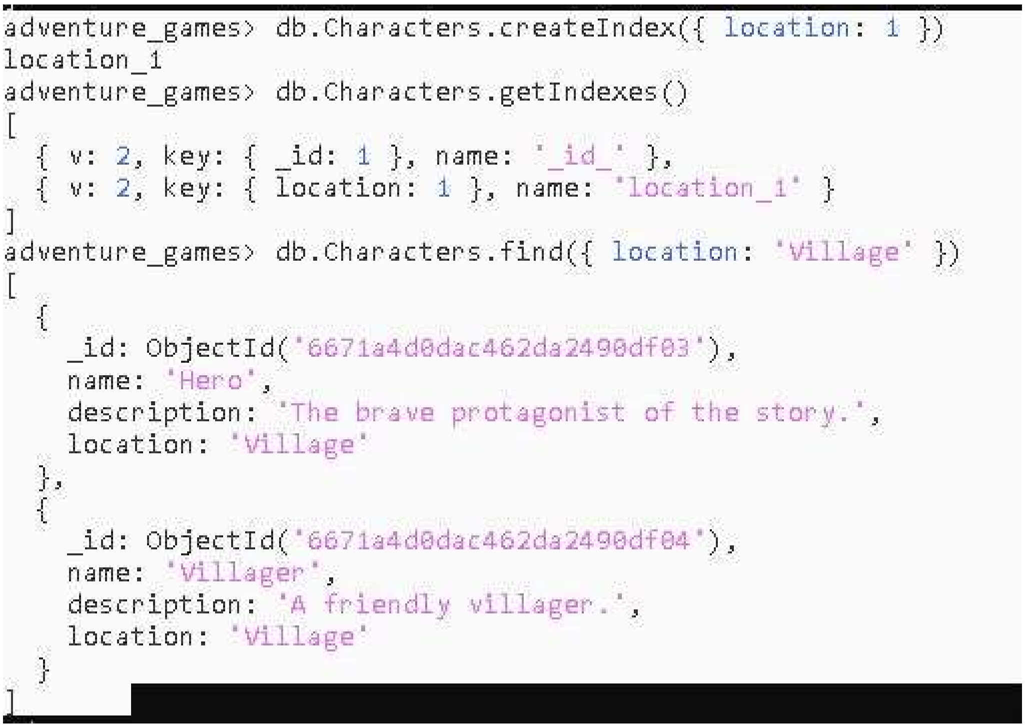
db.Locations.createIndex({ name: 1 })

db.Locations.getIndexes()

db.Characters.createIndex({ location: 1 })

db.Characters.getIndexes()

• Test the impact of indexes on query speed by comparing performance before and after indexing.



```
adventure_games> db.Characters.createIndex({ location: 1 })
location_1
adventure_games> db.Characters.getIndexes()
[
  { v: 2, key: { _id: 1 }, name: '_id_' },
  { v: 2, key: { location: 1 }, name: 'location_1' }
]
adventure_games> db.Characters.find({ location: 'Village' })
[
  {
    _id: ObjectId('6671a4d0dac462da2490df03'),
    name: 'Hero',
    description: 'The brave protagonist of the story.',
    location: 'Village'
  },
  {
    _id: ObjectId('6671a4d0dac462da2490df04'),
    name: 'Villager',
    description: 'A friendly villager.',
    location: 'Village'
  }
]
```