**Optimizations**

**A) Spring Boot Application Configuration**

External Injected Configuration

Create a separate configuration properties file which holds all configuration properties.

Use Springs’ @ConfigurationProperties in order to attach the file’s configuration properties in a separate class.

@ConfigurationProperties(prefix = "app.file")

public class FileStorageProperties {

private String csvuUploadDir;

}

**B) Caching**

In case we have frequently queried data that remains unchanged.

@Service

public class PlayerService {

@Cacheable("players")

public List<Player> getAllPlayers() {

return repository.findAll();

}

}

**C) Batch Processing**

It’s a great way to improve performance when handling large CSV files.

For bulk inserts to the database. It’s an efficient way to handle large volumes of data.

In the CSV file processing, the batch processing could be applied when saving the parsed Player objects to the database.

1. Configure the Spring Data JPA properties file to support batch operations, as it doesn’t support by default.
2. Modify the service method that processes the CSV file to save the List<Players>. Now instead of saving each Player instance individually, you can collect a batch and save them together for each save operation. This minimizes round trip calls to the database.

**D) Unit Tests**

Add unit tests for example at the service level

@SpringBootTest

public class FileServiceTest {

@Autowired

private FileService fileService;

@Test

public void testProcessFileAsync() {

MockMultipartFile file = new MockMultipartFile("data", "players.csv", "text/csv");

String jobId = fileService.processFileAsync(file);

assertNotNull(jobId);

}

}

**E) Scalability**

**Horizontal Pod Autoscaler** : Configure HPA to auto-scale your pods based on their load.

Add a yaml file for example:

apiVersion: autoscaling/v1

kind: HorizontalPodAutoscaler

metadata:

name: csvmanager-hpa

spec:

scaleTargetRef:

apiVersion: apps/v1

kind: Deployment

name: csvmanager-deployment

minReplicas: 1

maxReplicas: 10

targetCPUUtilizationPercentage: 80