



DEPARTAMENTO DE CIENCIAS DE LA COMPUTACION

PROGRAMACION ORIENTADA A OBJETOS

ACTIVIDAD AUTONOMA N.1

Proyecto: Aplicación de Gestión de Tareas con Interfaz Gráfica y Base de Datos NoSQL



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Aplicación de Gestión de Tareas con Interfaz Gráfica y Base de Datos

1. Introducción

En la actualidad, la gestión eficiente de tareas es fundamental para optimizar el tiempo y la productividad. Las aplicaciones de gestión de tareas permiten a los usuarios organizar sus actividades de manera estructurada, facilitando su seguimiento y ejecución. Este proyecto tiene como objetivo desarrollar una aplicación con una interfaz gráfica intuitiva y una base de datos NoSQL para el almacenamiento de información. Se implementarán los principios SOLID para garantizar un diseño de software flexible, mantenible y escalable.

2. Objetivos

Objetivo General

Desarrollar una aplicación de gestión de tareas con interfaz gráfica, utilizando una base de datos NoSQL y aplicando los principios SOLID para mejorar la calidad del software.

Objetivos Específicos

- Diseñar una interfaz gráfica amigable e intuitiva que facilite la interacción del usuario.
- Implementar una base de datos NoSQL para el almacenamiento y consulta eficiente de las tareas.
- Aplicar los principios SOLID para garantizar un código limpio, modular y escalable.

- Integrar funcionalidades clave como creación, edición, eliminación y categorización de tareas.
- Evaluar el rendimiento y la usabilidad de la aplicación a través de pruebas y ajustes iterativos.

3. *Marco Teórico*

Gestión de Tareas y Productividad

Las aplicaciones de gestión de tareas son herramientas diseñadas para ayudar a los usuarios a organizar sus actividades diarias, priorizar responsabilidades y mejorar la eficiencia. Estas aplicaciones pueden incluir funciones como recordatorios, categorización y colaboración en equipo.

Bases de Datos NoSQL

Las bases de datos NoSQL son sistemas de almacenamiento de datos que no siguen el modelo relacional tradicional. Se caracterizan por su flexibilidad, escalabilidad y rendimiento en grandes volúmenes de datos. Ejemplos de bases de datos NoSQL incluyen MongoDB, Firebase y CouchDB.

Principios SOLID

Los principios SOLID son un conjunto de buenas prácticas en el diseño de software que facilitan la mantenibilidad y escalabilidad del código. Estos principios son:

- S (Single Responsibility Principle): Cada clase debe tener una única responsabilidad.
- (Open/Closed Principle): El código debe estar abierto a la extensión, pero cerrado a la modificación.

- L (Liskov Substitution Principle): Los objetos de una clase derivada deben poder sustituir a los de su clase base sin alterar el comportamiento del programa.
- I (Interface Segregation Principle): Las interfaces deben ser específicas y evitar incluir métodos innecesarios.
- D (Dependency Inversion Principle): Los módulos de alto nivel no deben depender de módulos de bajo nivel, sino de abstracciones.

3.1 Análisis del proceso

El flujo del sistema se describe en los siguientes pasos:

- El usuario accede a la aplicación y visualiza las tareas existentes.
- Puede agregar nuevas tareas con un título, descripción y estado.
- Puede modificar o eliminar tareas según sea necesario.
- La base de datos NoSQL almacena y recupera las tareas de forma dinámica.

3.2 Análisis de requisitos

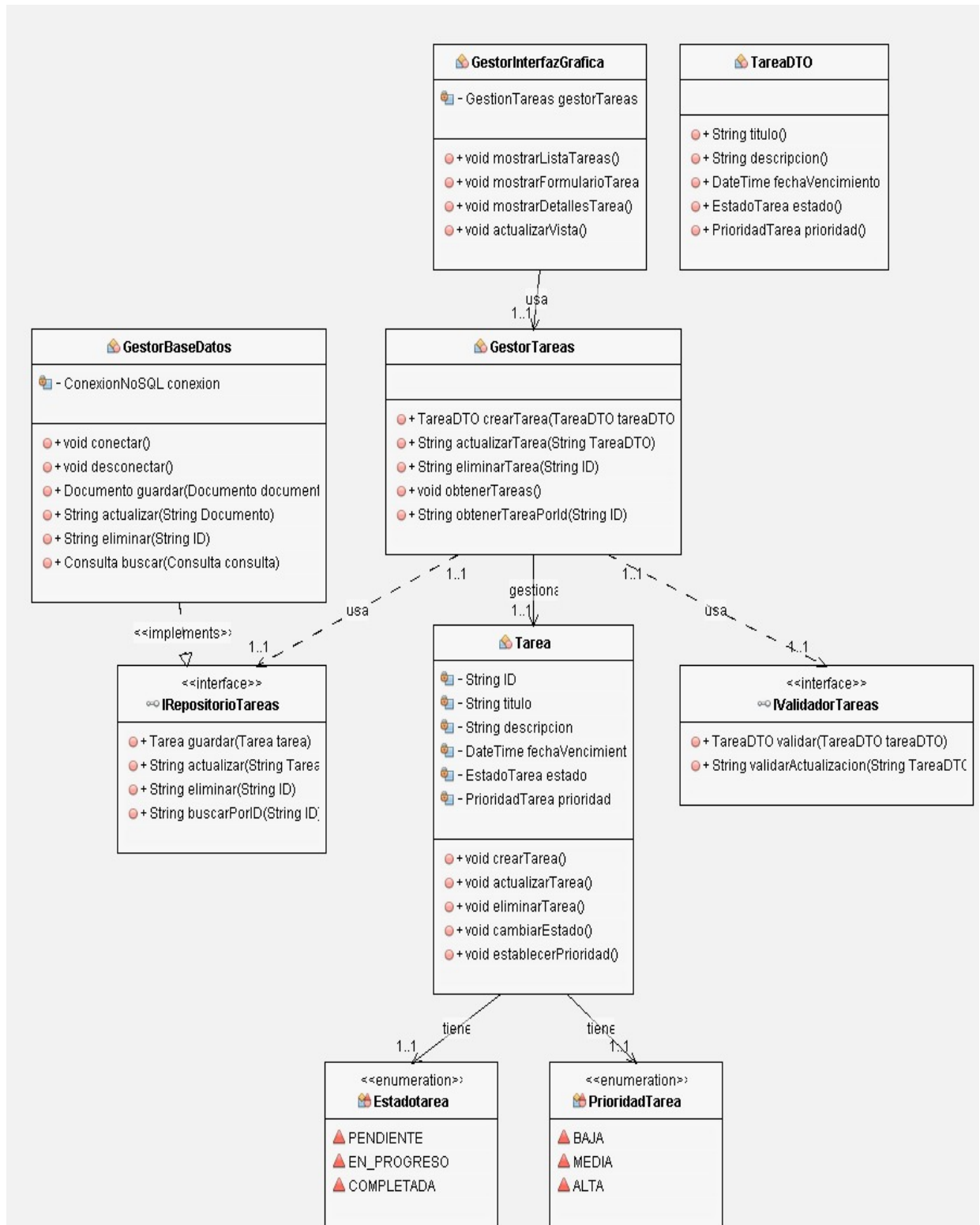
Requisitos Funcionales:

- Permitir la creación, modificación y eliminación de tareas.
- Almacenar tareas en una base de datos NoSQL.
- Implementar una interfaz gráfica para la interacción del usuario.
- Filtrar tareas por estado (pendiente, en progreso, completada).

Requisitos No Funcionales:

- La aplicación debe ser intuitiva y fácil de usar.
- La base de datos debe manejar grandes volúmenes de información eficientemente.
- Se debe garantizar la persistencia de los datos en cada operación.

3.3 Diagrama UML



4. *Resultados*

El sistema permite registrar, actualizar y listar productos de manera eficiente. Se logró calcular el valor total del inventario de forma dinámica, facilitando la gestión y toma de decisiones dentro del negocio.

5. *Conclusiones*

El desarrollo de una aplicación de gestión de tareas con base de datos NoSQL y principios SOLID proporciona una solución eficiente, escalable y mantenible. La implementación de estos principios mejora la modularidad del código, facilita la depuración y reduce el acoplamiento, permitiendo futuras mejoras sin afectar el sistema principal.

6. *Recomendaciones*

- Mantener una documentación clara y detallada del código para facilitar futuras actualizaciones.
- Implementar pruebas automatizadas para garantizar el correcto funcionamiento de la aplicación.
- Considerar el feedback de los usuarios para mejorar la experiencia y usabilidad de la interfaz gráfica.
- Explorar la posibilidad de integrar servicios en la nube para mejorar la accesibilidad y sincronización de las tareas en múltiples dispositivos.

7. *Evidencias*

Ejecución del programa con conexión local y usando neatbeans

Primero se debe instalar mongodb y mongo dbcompass una vez hecho esto para nuestra conexion iremos al cmd y ejecutamos el comando mongod para poder tener conexion con nuestra base de datos y creamos una base de datos

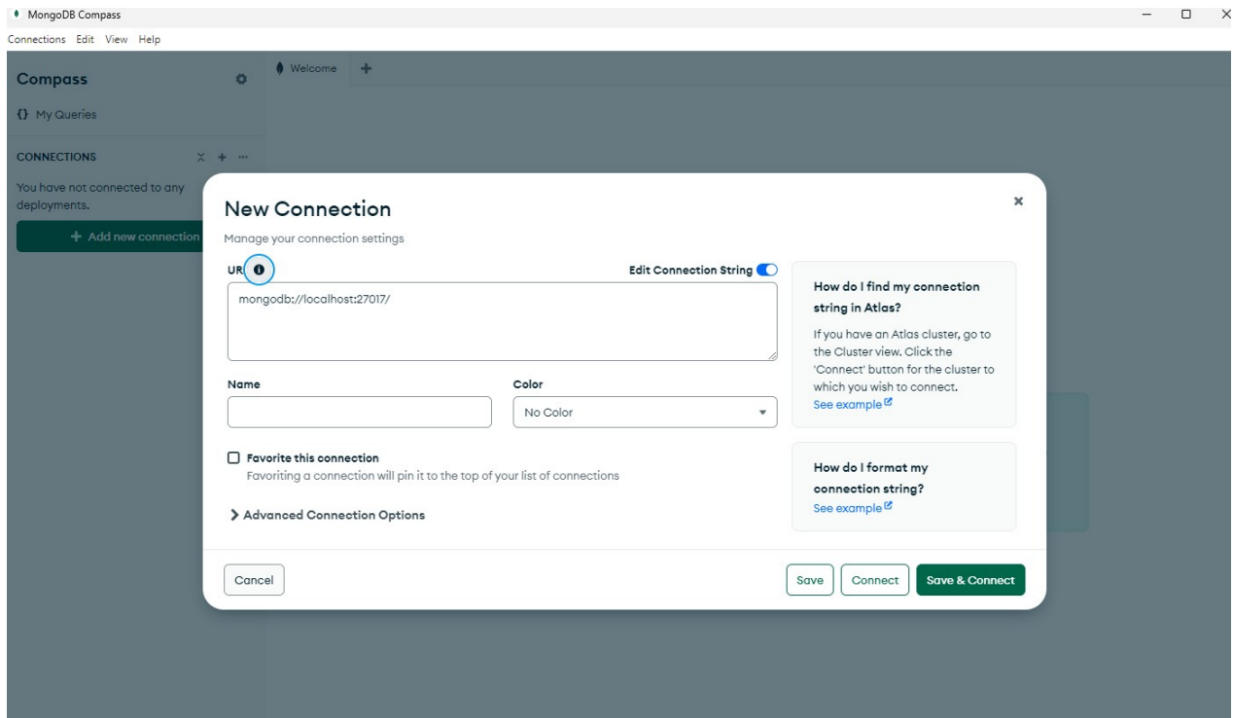
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Microsoft Windows [Version 10.0.22631.4761]
(c) Microsoft Corporation. All rights reserved.

C:\Users\lesstam\mongodb>

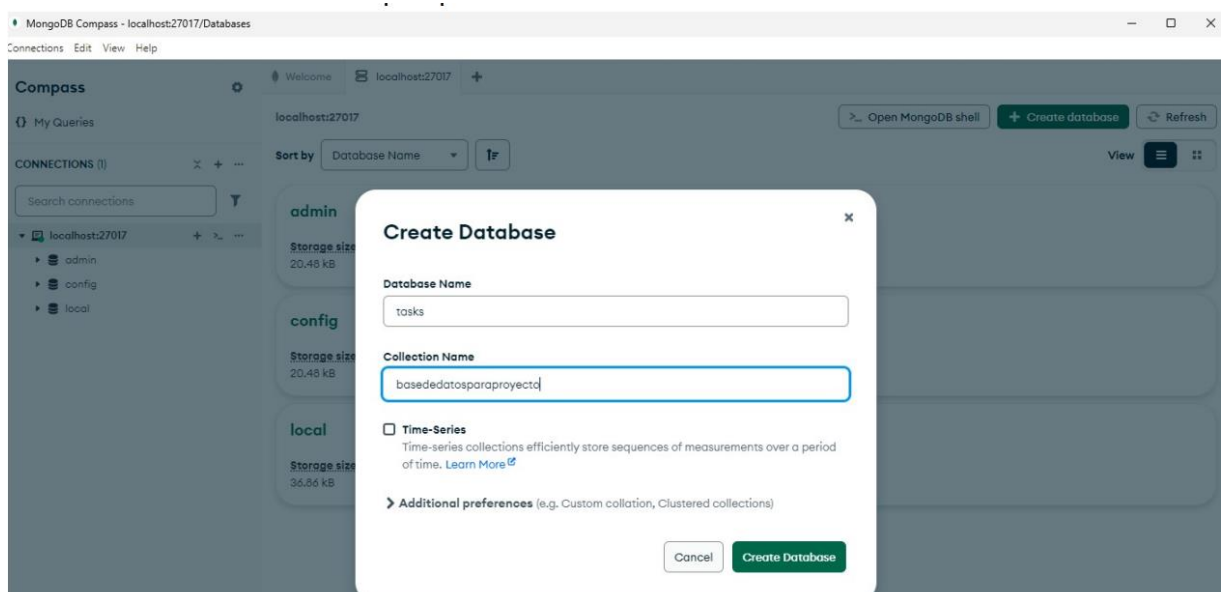
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{"t":{"$date":"2025-02-06T16:16:00.620-05:00"},"s":"I",  "c":"WIRECOV",  "id":22430,  "ctx":"initandlisten", "msg":"WiredTiger message", "attr":{"message":{"ts_sec":1738876560,"ts_usec":623929,"thread":"948:14078025093104","session_name":"txn-recover","category":"WT_VERB_CHECKPOINT_PROGRESS","category_id":7,"verbose_level":"DEBUG_1","verbose_level_id":1,"msg":"Saving checkpoint snapshot min: 1, snapshot max: 1 snapshot count: 0, oldest timestamp: (0, 0), meta checkpoint timestamp: (0, 0) base write gen: 66"}}}}
{"t":{"$date":"2025-02-06T16:16:00.641-05:00"},"s":"I",  "c":"WIRECOV",  "id":22430,  "ctx":"initandlisten", "msg":"WiredTiger message", "attr":{"message":{"ts_sec":1738876560,"ts_usec":641265,"thread":"948:14078025093104","session_name":"txn-recover","category":"WT_VERB_RECOVERY_PROGRESS","category_id":34,"verbose_level":"DEBUG_1","verbose_level_id":1,"msg":"Recovery checkpoint has successfully finished and ran for 21 milliseconds"}}}}
{"t":{"$date":"2025-02-06T16:16:00.641-05:00"},"s":"I",  "c":"WIRECOV",  "id":22430,  "ctx":"initandlisten", "msg":"WiredTiger message", "attr":{"message":{"ts_sec":1738876560,"ts_usec":641265,"thread":"948:14078025093104","session_name":"txn-recover","category":"WT_VERB_RECOVERY_PROGRESS","category_id":34,"verbose_level":"DEBUG_1","verbose_level_id":1,"msg":"Recovery was completed successfully and took 333ms, including 310ms for the log replay, 0ms for the rollback to stable, and 21ms for the checkpoint."}}}}
{"t":{"$date":"2025-02-06T16:16:00.648-05:00"},"s":"I",  "c":"STORAGE",  "id":4929900, "ctx":"initandlisten", "msg":"WiredTiger opened", "attr":{"durationMillis":361}}
{"t":{"$date":"2025-02-06T16:16:00.648-05:00"},"s":"I",  "c":"RECOVERY", "id":23987,  "ctx":"initandlisten", "msg":"WiredTiger recovery timestamp", "attr":{"recoveryTimestamp":{"timestamp":{"t":0,"i":0}}}}
{"t":{"$date":"2025-02-06T16:16:00.660-05:00"},"s":"W",  "c":"CONTROL",  "id":22120,  "ctx":"initandlisten", "msg":"Access control is not enabled for the database. Read and write access to data and configuration is unrestricted, tags"}
{"t":{"$date":"2025-02-06T16:16:00.660-05:00"},"s":"W",  "c":"CONTROL",  "id":22140,  "ctx":"initandlisten", "msg":"This server is bound to localhost. Remote systems will be unable to connect to this server. S responses from, or with --bind_ip.all to bind to all interfaces. If this behavior is desired, start the server with --bind_ip 127.0.0.1 to disable this warning, tags"}
{"t":{"$date":"2025-02-06T16:16:00.663-05:00"},"s":"I",  "c":"NETWORK",  "id":4915702, "ctx":"initandlisten", "msg":"Updated wire specification", "attr":{"oldSpec":{"incomingExternalClient":{"minWireVersion":0,"maxWireVersion":25},"incomingInternalClient":{"minWireVersion":0,"maxWireVersion":25},"outgoing":{"minWireVersion":6,"maxWireVersion":25},"isInternalClient":true},"newSpec":{"incomingExternalClient":{"minWireVersion":0,"maxWireVersion":25},"incomingInternalClient":{"minWireVersion":0,"maxWireVersion":25},"outgoing":{"minWireVersion":25,"maxWireVersion":25},"isInternalClient":true}}}
{"t":{"$date":"2025-02-06T16:16:00.663-05:00"},"s":"I",  "c":"REPL",  "id":5853300, "ctx":"initandlisten", "msg":"Current featureCompatibilityVersion value", "attr":{"featureCompatibilityVersion":"8.0","contentStartup"}}
{"t":{"$date":"2025-02-06T16:16:00.663-05:00"},"s":"I",  "c":"STORAGE",  "id":5871300, "ctx":"initandlisten", "msg":"Clearing temp directory"}
{"t":{"$date":"2025-02-06T16:16:00.664-05:00"},"s":"I",  "c":"CONTROL",  "id":6608290, "ctx":"initandlisten", "msg":"Initializing cluster server parameters from disk"}
{"t":{"$date":"2025-02-06T16:16:00.664-05:00"},"s":"I",  "c":"CONTROL",  "id":28536,  "ctx":"initandlisten", "msg":"Flow Control is enabled on this deployment"}
{"t":{"$date":"2025-02-06T16:16:00.626-05:00"},"s":"I",  "c":"FTDC",  "id":28025,  "ctx":"initandlisten", "msg":"Initializing full-time diagnostic data capture", "attr":{"dataDirectory":"/data/db/diagnostic_data"}}
{"t":{"$date":"2025-02-06T16:16:00.820-05:00"},"s":"I",  "c":"REPL",  "id":6015317, "ctx":"initandlisten", "msg":"Setting new configuration state", "attr":{"newState":"ConfigReplicationDisabled","oldState":"ConfigPreStart"}}
{"t":{"$date":"2025-02-06T16:16:00.820-05:00"},"s":"I",  "c":"STORAGE",  "id":22262,  "ctx":"initandlisten", "msg":"Timestamp monitor starting"}
{"t":{"$date":"2025-02-06T16:16:00.820-05:00"},"s":"I",  "c":"STORAGE",  "id":2333003, "ctx":"initandlisten", "msg":"Starting the DiskSpaceMonitor"}
{"t":{"$date":"2025-02-06T16:16:00.830-05:00"},"s":"I",  "c":"NETWORK",  "id":23015,  "ctx":"listener", "msg":"Listening on", "attr":{"address":"127.0.0.1:27017"}}
{"t":{"$date":"2025-02-06T16:16:00.830-05:00"},"s":"I",  "c":"NETWORK",  "id":23016,  "ctx":"listener", "msg":"Waiting for connections", "attr":{"port":27017,"ssl":"off"}}
{"t":{"$date":"2025-02-06T16:16:00.830-05:00"},"s":"I",  "c":"CONTROL",  "id":8023403, "ctx":"initandlisten", "msg":"mongod startup complete", "attr":{"summaryOfTimeElapsed":{"Startup from clean shutdown":{"tr online certificate status protocol manager":"0 ms","Transport layer setup":"0 ms","Run initial syncer crash storage engine":"0 ms","Create storage engine lock file in the data directory":"0 ms","Get metadata describing storage engine":"0 ms","Validate options in metadata against current startup options":"361 ms","Create storage engine":"361 ms","Write current PID to file":"0 ms","Initialize FCV before rebuilding indexes":"3 ms","Drop abandoned idents and get back indexes that need to be rebuilt or builds that need to be restarted":"0 ms","Rebuild indexes for collections":"0 ms","Load cluster parameters from disk for a standalone":"0 ms","Build user and roles graph":"0 ms","Set up the background thread pool responsible for waiting for options to be majority committed":"0 ms","Start up the replication coordinator":"0 ms","Ensure the change stream collections on startup contain consistent data":"0 ms","Write startup options to the audit log":"0 ms","Start transport layer":"0 ms","Init and listen total elapsed time":"540 ms"}}}}
{"t":{"$date":"2025-02-06T16:16:01.004-05:00"},"s":"W",  "c":"CONTROL",  "id":636300, "ctx":"ftdc", "msg":"Use of deprecated server parameter name", "attr":{"deprecatedName":"internalQueryCacheSize","canonicalName":"internalQueryCacheMaxEntriesPerCollection"}}
{"t":{"$date":"2025-02-06T16:16:01.004-05:00"},"s":"W",  "c":"CONTROL",  "id":636300, "ctx":"ftdc", "msg":"Use of deprecated server parameter name", "attr":{"deprecatedName":"oplogSamplingLogIntervalSeconds","canonicalName":"oplogSamplingIntervalSeconds"}}
{"t":{"$date":"2025-02-06T16:16:01.004-05:00"},"s":"W",  "c":"NETWORK",  "id":23803,  "ctx":"ftdc", "msg":"Use of deprecated server parameter name 'sslMode', please use 'tlsMode' instead."}
{"t":{"$date":"2025-02-06T16:16:01.004-05:00"},"s":"W",  "c":"CONTROL",  "id":636300, "ctx":"ftdc", "msg":"Use of deprecated server parameter name", "attr":{"deprecatedName":"wiredTigerConcurrentReadTransaction","canonicalName":"StorageEngineConcurrentReadTransactions"}}
{"t":{"$date":"2025-02-06T16:16:01.005-05:00"},"s":"W",  "c":"CONTROL",  "id":636300, "ctx":"ftdc", "msg":"Use of deprecated server parameter name", "attr":{"deprecatedName":"wiredTigerConcurrentWriteTransactions","canonicalName":"StorageEngineConcurrentWriteTransactions"}}
```

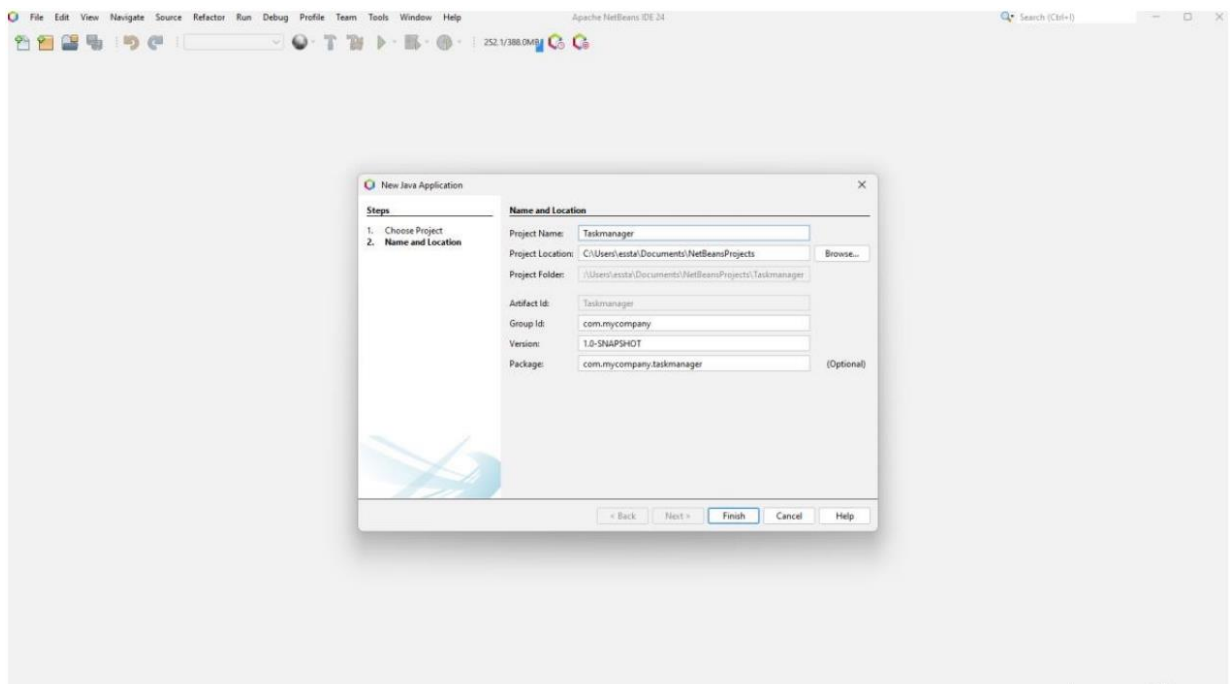
Recordemos que la conexión para poder hacerla en el cmd o power Shell no debe darnos línea de comando si no quedar en vacío hasta realizar la conexión A continuación, en mongodb compass creamos una conexión o usamos una conexión reciente en l puerto 27017 que es el localhost



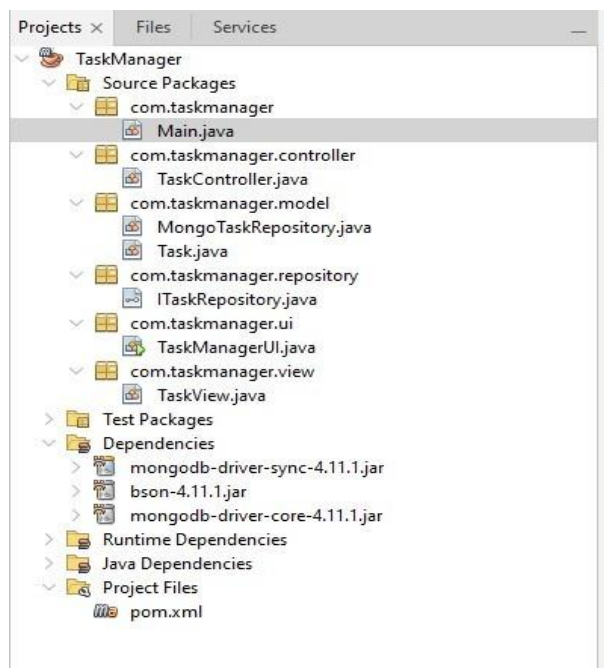
Una vez realizado esto creamos nuestra base de datos con el nombre que queramos



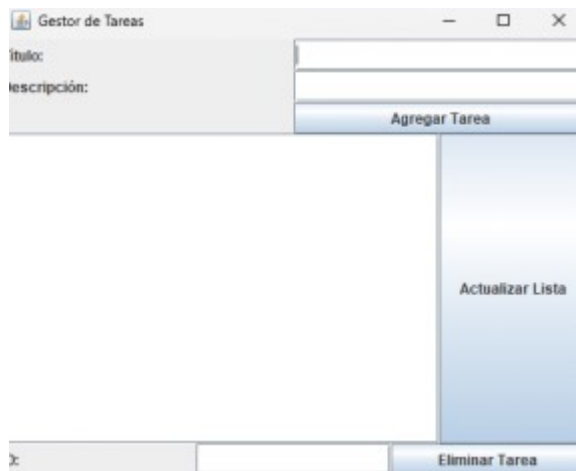
Ahora en netbeans vamos a crear un nuevo proyecto en java with Maven para la conexión y usamos Java Application



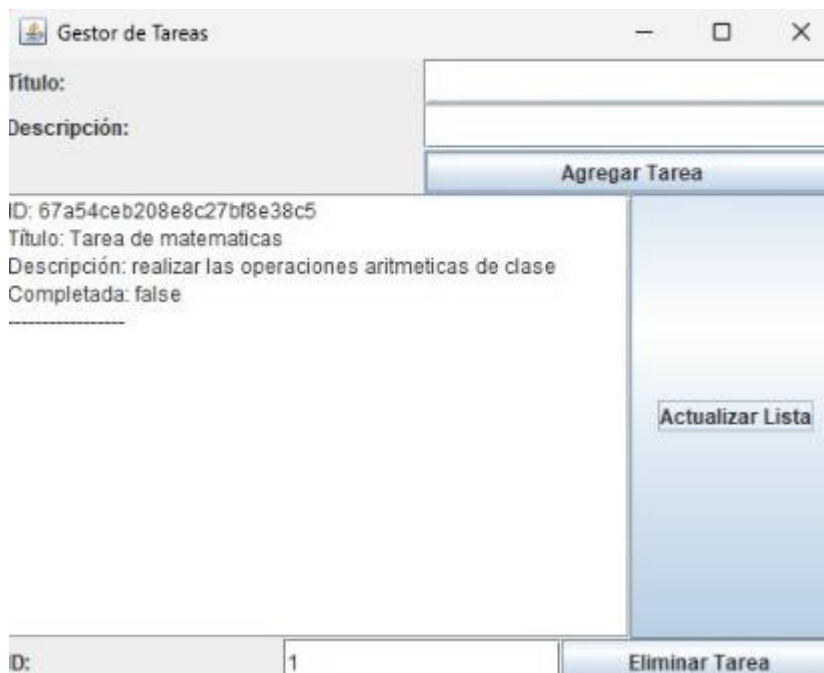
A continuación creamos los 7 archivos incluido con MVC tomando en cuenta que el main está en el archivo TaskManagerIU.jkava y un archivo más para las dependencias que será el pom.xml



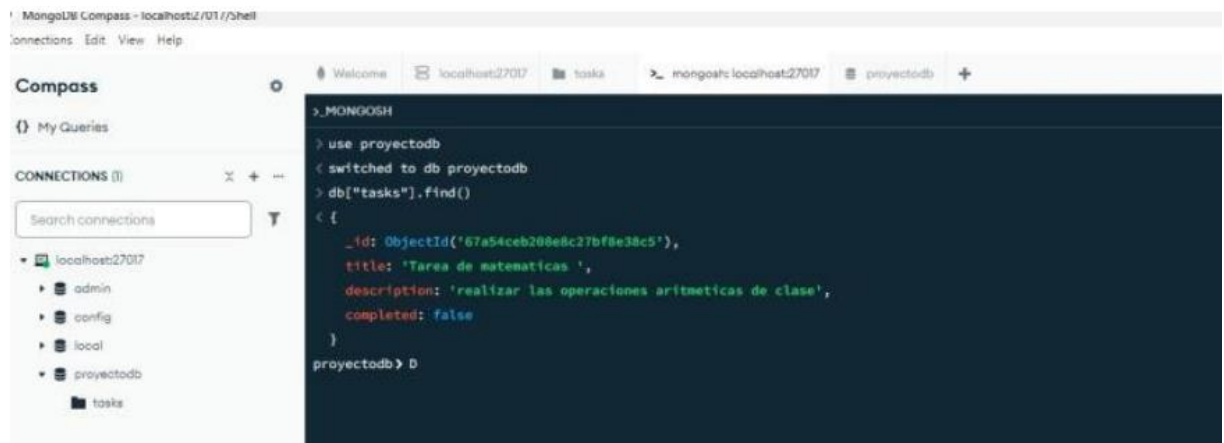
A continuación, se realiza todo el código que para nuestro proyecto y ejecutamos desde el main para tener una vista tal que así



A continuación, vamos a ir agregando tareas



Ahora vamos a mongoddbcompass y abrimos el MongoDB Shell y nos mopstrara nuestros datos ingresados



Finalmente, aquí se muestran más ejemplos de la ejecución

Gestor de Tareas

Título:

Tarea de Lengua

Descripción:

Realizar las oraciones en participios

Agregar Tarea

ID: 67a54ceb208e8c27bf8e38c5
Título: Tarea de matematicas
Descripción: realizar las operaciones aritmeticas de clase
Completada: false

Actualizar Lista

ID:

Eliminar Tarea

Gestor de Tareas

Título:

Descripción:

Agregar Tarea

ID: 67a54ceb208e8c27bf8e38c5
 Título: Tarea de matematicas
 Descripción: realizar las operaciones aritmeticas de clase
 Completada: false

ID: 67a56e0b08770939435b42ec
 Título: Tarea de Lengua
 Descripción: Realizar las oraciones en particpios
 Completada: false

ID: 67a56e2308770939435b42ed
 Título: Tarea de Programaicon
 Descripción: realizar os progamas de c++
 Completada: false

Actualizar Lista

Eliminar Tarea

The screenshot shows the MongoDB Compass application. On the left, the 'CONNECTIONS (1)' panel lists the connection 'localhost:27017' with databases 'admin', 'config', 'local', and 'projectodb'. The 'tasks' collection is selected under 'projectodb'. The main terminal window shows the following commands and output:

```
> use projectodb
< switched to db projectodb
> db["tasks"].find()
< {
  _id: ObjectId('67a54ceb208e8c27bf8e38c5'),
  title: 'Tarea de matematicas ',
  description: 'realizar las operaciones aritmeticas de clase',
  completed: false
}
{
  _id: ObjectId('67a56e0b8770939435b42ec'),
  title: 'Tarea de Lengua ',
  description: 'Realizar las oraciones en participios ',
  completed: false
}
{
  _id: ObjectId('67a56e238770939435b42ed'),
  title: 'Tarea de Programaicon ',
  description: 'realizar os programas de c++',
  completed: false
}
}
projectodb>
```

MongoDB Compass - localhost:27017/proyectodb.tasks

Connections Edit View Collection Help

Compass

My Queries

CONNECTIONS (1)

Search connections

localhost:27017

- admin
- config
- local
- proyectodb
 - tasks

localhost:27017 > proyectodb > tasks

Documents 1 Aggregations Schema Indexes 1 Validation

Type a query: { field: 'value' } or [Generate query](#)

Explain Reset Find Options

ADD DATA EXPORT DATA UPDATE DELETE

25 1 - 3 of 3

```
_id: ObjectId('67a54ceb268e9c27bf8e38c5')
title: "Tarea de matematicas "
description: "realizar las operaciones aritmeticas de clase"
completed: false
```

```
_id: ObjectId('67a56e0b08770939435b42ec')
title: "Tarea de Lengua "
description: "Realizar las oraciones en participios "
completed: false
```

```
_id: ObjectId('67a56e2308770939435b42ed')
title: "Tarea de Programacion "
description: "realizar os programas de c++"
completed: false
```