

Group 3:

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CS 417

Final Project Submission

How to configure and run the project

We've packaged the code into a .jar file which will be able to run on Windows and Linux. You can download the release from our group 3 github repo. The file to download is called

racingbot.zip

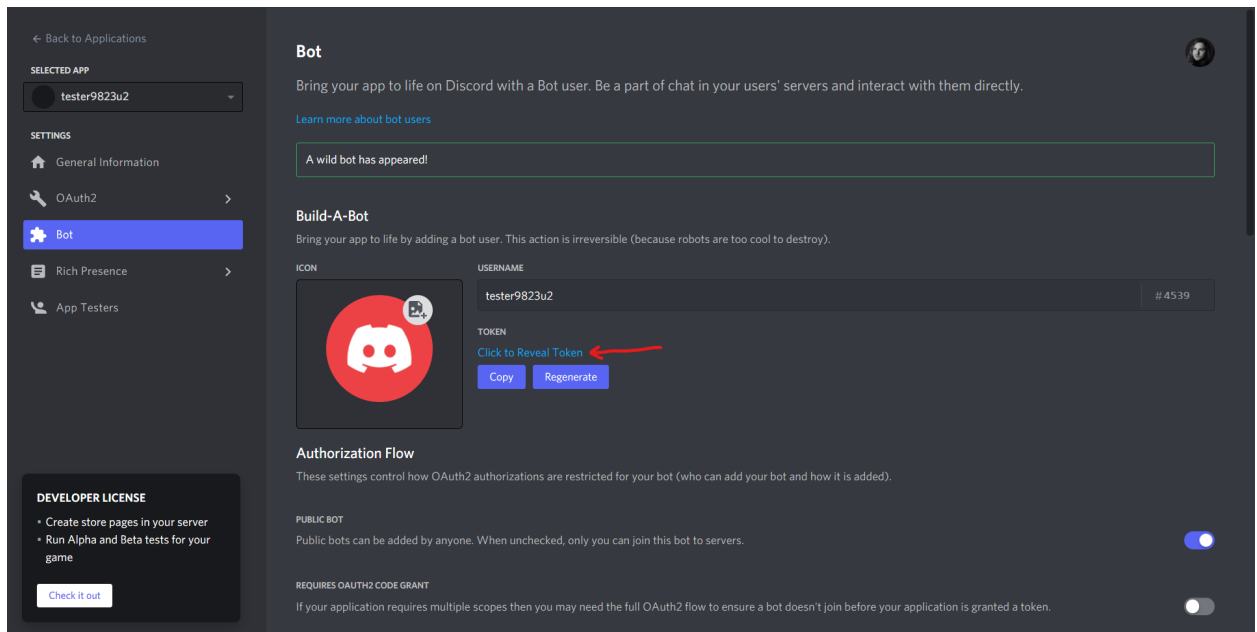
<https://github.com/CCSU-DesignPatterns-F21/final-project-f21-group3/releases/tag/1.0.1>

Since this is a Discord bot, you will need to create a new Discord bot (and you'll need a Discord account). Also, we use MongoDB for a database. All install instructions are outlined below.

To create a discord bot

1. Go to <https://discord.com/developers/applications>. You may need to sign up for or log into a discord account to see this page.
2. Create a new application.
3. Give the bot a unique name. Ex. "Racing Bot 62948272". These names are like usernames, so if you find this name is already taken at step 5, you'll have to rename it.
4. While on the page where you can see and edit the newly created bot's details, navigate to the bot tab.
5. Click "Add a Bot"

6. Once you land onto the bot details page, **copy the secret token** and keep it on hand.



7. Still on the bot details page, scroll down where you see bot privileges. For simplicity, give the bot administrator privileges.

Adding the discord bot to a server

1. Open up Discord and log in. If you don't have it on your system, download and install it here: <https://discord.com/>
2. Create your own server
3. Navigate back to the <https://discord.com/developers/applications> page and click on your bot.
4. Navigate to OAuth > URL Generator
5. Check "Bot" under scopes and then check "Administrator" under Bot Permissions.

6. There should be a link that has appeared at the bottom of the page. Copy it and visit it:

← Back to Applications

SELECTED APP

T2973927482

SETTINGS

- General Information
- OAuth2**
- General
- URL Generator
- Bot
- Rich Presence
- App Testers

DEVELOPER LICENSE

- Create store pages in your server
- Run Alpha and Beta tests for your game

Check it out

BOT PERMISSIONS

GENERAL PERMISSIONS	TEXT PERMISSIONS	VOICE PERMISSIONS
<input checked="" type="checkbox"/> Administrator	<input type="checkbox"/> Send Messages	<input type="checkbox"/> Connect
<input type="checkbox"/> View Audit Log	<input type="checkbox"/> Create Public Threads	<input type="checkbox"/> Speak
<input type="checkbox"/> View Server Insights	<input type="checkbox"/> Create Private Threads	<input type="checkbox"/> Video
<input type="checkbox"/> Manage Server	<input type="checkbox"/> Send Messages in Threads	<input type="checkbox"/> Mute Members
<input type="checkbox"/> Manage Roles	<input type="checkbox"/> Send TTS Messages	<input type="checkbox"/> Deafen Members
<input type="checkbox"/> Manage Channels	<input type="checkbox"/> Manage Messages	<input type="checkbox"/> Move Members
<input type="checkbox"/> Kick Members	<input type="checkbox"/> Manage Threads	<input type="checkbox"/> Use Voice Activity
<input type="checkbox"/> Ban Members	<input type="checkbox"/> Embed Links	<input type="checkbox"/> Priority Speaker
<input type="checkbox"/> Create Instant Invite	<input type="checkbox"/> Attach Files	
<input type="checkbox"/> Change Nickname	<input type="checkbox"/> Read Message History	
<input type="checkbox"/> Manage Nicknames	<input type="checkbox"/> Mention Everyone	
<input type="checkbox"/> Manage Emojis and Stickers	<input type="checkbox"/> Use External Emojis	
<input type="checkbox"/> Manage Webhooks	<input type="checkbox"/> Use External Stickers	
<input type="checkbox"/> Read Messages/View Channels	<input type="checkbox"/> Add Reactions	
<input type="checkbox"/> Manage Events	<input type="checkbox"/> Use Slash Commands	

GENERATED URL

https://discord.com/api/oauth2/authorize?client_id=914646929881829407&permissions=8&scope=bot

Copy

7. When you visit that link, you can add the bot to the server of your choice.

What to do with the discord bot secret token

Our code will first look for an encrypted file called AppConfig with all of our keys and other secrets. If it cannot find it, then it will fall back to using the unencrypted config.properties file.

Encrypted version

We don't have direct access to group 1's encryption software, but we supplied an example xml file with the correct structure needed so that when it's encrypted using their software it will work with our bot.

1. Rename the AppConfig.xml.example (**/project-root/AppConfig.xml.example**) to AppConfig.xml. This is where all necessary keys and database info will go.
2. Open up AppConfig.xml and paste the discord secret token into there.
3. For the remaining fields, we need mongodb installed. Instructions on that are found in the next section.

Unencrypted version

1. Rename config.properties.example (**/project-root/config.properties.example**) to config.properties. This is where all necessary keys and database info will go.
2. Open up config.properties and paste the discord secret token into there.
3. For the remaining fields, we need mongodb installed. Instructions on that are found in the next section.

Now in order to use the bot, you must install MongoDB.

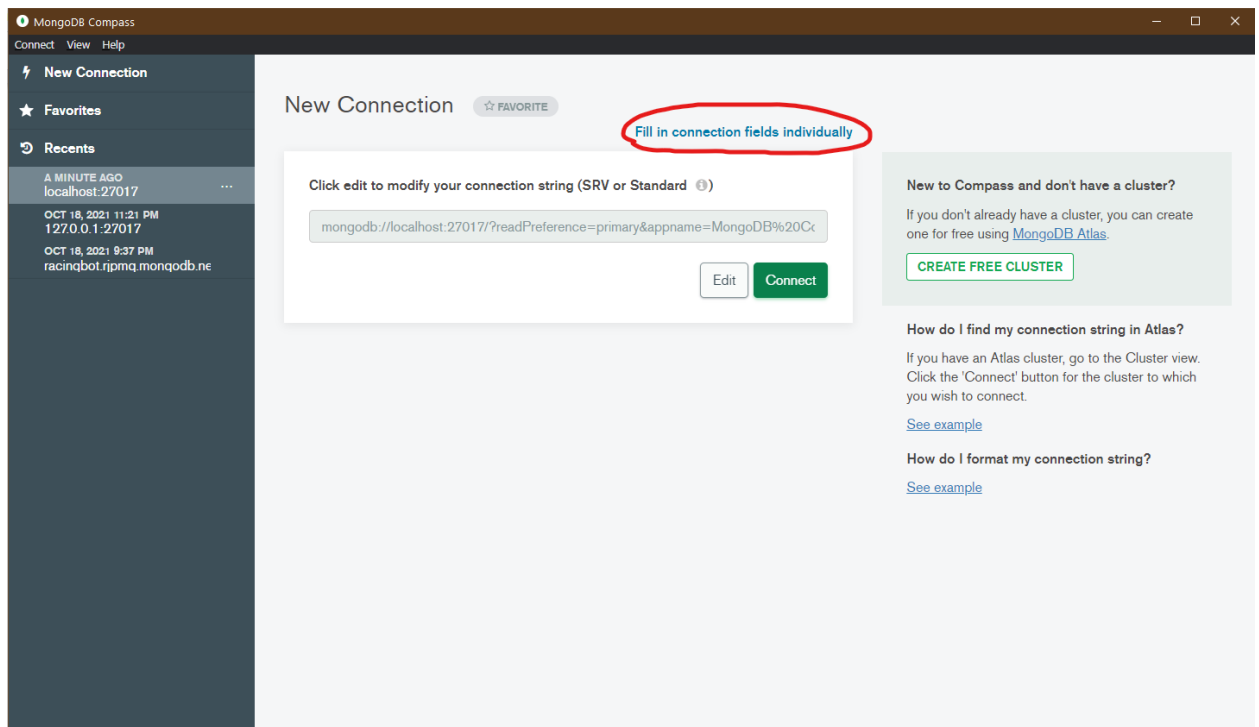
Setting up MongoDB for Windows

(<https://docs.mongodb.com/manual/tutorial/install-mongodb-on-windows/>)

1. Download MongoDB
https://www.mongodb.com/try/download/community?tck=docs_server
2. Run the installer and complete the setup wizard.
 - a. Service Configuration: Make sure that “Install MongoDB as a Service” is checked.
3. As a note, you may need to add the bin folder from the mongodb folder into your PATH. (

Install mongo compass and create the database

1. Download mongo compass here: <https://www.mongodb.com/try/download/compass>
2. If you’ve downloaded as a zip, extract the files then run MongoDBCompass.exe.
3. You should see this screen:



Click “Fill in connection fields individually”

4. Fill out the fields as shown here, with the hostname as localhost and the port as 27017, then click connect.

The screenshot shows the 'New Connection' window in MongoDB Compass. At the top, there's a 'New Connection' title and a 'FAVORITE' button. A link 'Paste connection string' is in the top right. Below is a tabbed interface with 'Hostname' and 'More Options'. The 'Hostname' tab is active, showing a 'Hostname' field with 'localhost', a 'Port' field with '27017', an 'SRV Record' toggle switch (disabled), and an 'Authentication' dropdown menu set to 'None'. A green 'Connect' button is at the bottom right.

5. Create a new database (call it RacingBot) and add three collections: Users, Shops, and Events. Add the name of the database to config.properties.

NOTE: Since you've started a local server without authentication, you will leave *mongoDBUsername* and *mongoDBPass* blank.

Run the Bat

With Mongo Compass running, the discord bot credentials placed into the config.properties/AppConfig file, we can now run the bot! Within the racingbot.zip from the release in github, there's the **start.bat** file which you can use to start up the bot.

Patterns used and their associated classes

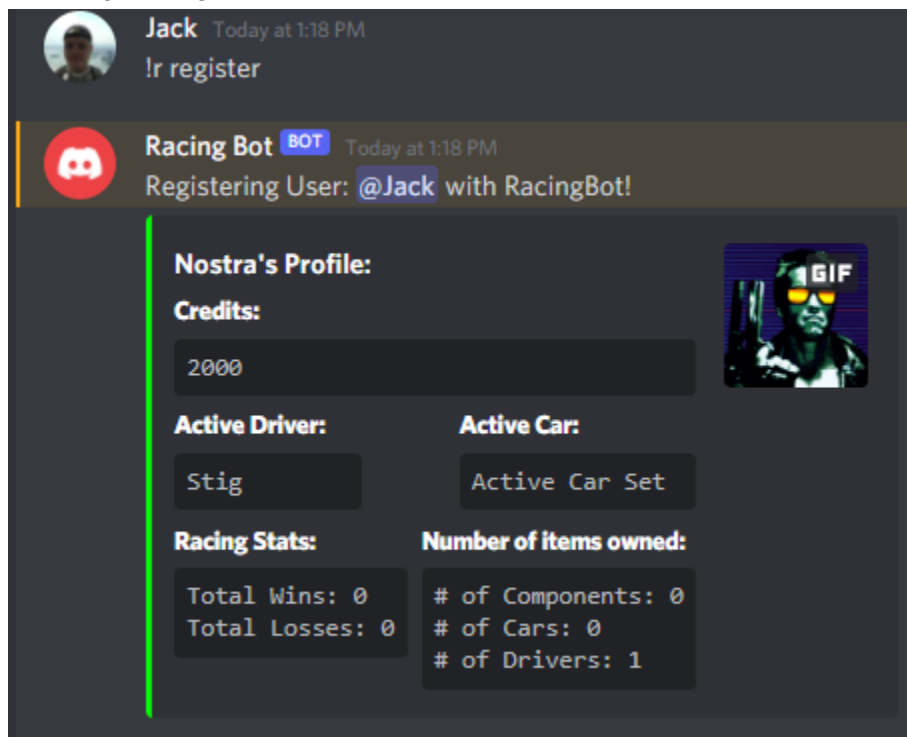
- Singleton
 - ConfigPropertiesHandler
 - AppConfig
 - Graduate Team Module Package: DesignPatterns.utils
 - DBHandler
- Observer
 - GameplayHandler
 - CustomObserver
- Abstract factory
 - Component

- ChassisComponent
 - TransmissionComponent
 - EngineComponent
 - SuspensionComponent
 - WheelComponent
 - ConcreteComponentFactory
 - ComponentFactory
- Chain of Responsibility
 - RaceTrack
 - TrackNode
 - StraightNode
 - CornerNode
- State
 - Driver
 - DriverState
 - Resting
 - Training
 - Racing
 - Aggressive
 - Normal
 - Defensive
 - Crashed
 - RacePending
 - Completed
 - DNF
 - FinishedRace
 - FinishedTraining
- Iterator
 - Iterator
 - ConcreteIterator
 - Inventory<T extends Unique>
- Decorator
 - Iterator
 - IteratorDecorator
 - QualityFilter<T extends MaterialFilterable>
 - DurabilityFilter<T extends MaterialFilterable>
 - ValueFilter<T extends MaterialFilterable>
 - WeightFilter<T extends MaterialFilterable>
 - ComposureFilter<T extends SkillFilterable>
 - AwarenessFilter<T extends SkillFilterable>
 - DraftingFilter<T extends SkillFilterable>
 - StraightsFilter<T extends SkillFilterable>
 - CorneringFilter<T extends SkillFilterable>
 - RecoveryFilter<T extends SkillFilterable>

- ComponentTypeFilter<T extends ComponentFilterable>
- Prototype
 - ICloneable
 - Car
 - Component
- Builder
 - CarBuilder
 - Car
- Strategy
 - Standings
 - SortStandings
 - DriverStandingsQuickSort
 - DriverStandingsMergeSort

The Racing Bot in Action

User registering




The screenshot shows a Discord chat interface. At the top, a user named Jack sends the command `!r register`. Below this, the Racing Bot (marked as a BOT) responds with the message: "Registering User: @Jack with RacingBot!".


The bot then displays a profile for "Nostra's Profile:" which includes the following information:


- Credits:** 2000
- Active Driver:** Stig
- Active Car:** Active Car Set
- Racing Stats:**
 - Total Wins: 0
 - Total Losses: 0
- Number of items owned:**
 - # of Components: 0
 - # of Cars: 0
 - # of Drivers: 1

A green vertical line is drawn on the left side of the profile information area. A small GIF of a person with yellow sunglasses is visible in the top right corner of the profile section.

User Profile

**Jack** Today at 1:19 PM
!r profile

**Racing Bot** BOT Today at 1:19 PM

Nostra's Profile:

Credits:

2000

Active Driver:

Stig

Active Car:

Active Car Set

Racing Stats:

Total Wins: 0
Total Losses: 0

Number of items owned:

of Components: 0
of Cars: 0
of Drivers: 1

Hourly shop update

**Racing Bot** BOT Today at 12:00 PM

Hourly Update!
Store Update
New Components and Cars for sale at the Stores!

Shop View

**DemoBot** BOT Yesterday at 2:07 AM

Chop Shop

You never know what you will find at the Chop Shop, stolen catalytic converters, wheels, rims and more! No questions asked, no refunds!


ENGINE	WHEELS	SUSPENSION
ID: 8r8	ID: uwl	ID: 435
ENGINE	WHEELS	SUSPENSION
Quality: LEMON	Quality: LEMON	Quality: LEMON
Value: 81	Value: 140	Value: 99
Durability: 50	Durability: 50	Durability: 50
Weight: 800	Weight: 800	Weight: 800
Speed: 25.0	Braking: 25.0	Handling: 25.0


CHASSIS	TRANSMISSION
ID: ean	ID: 1vh
CHASSIS	TRANSMISSION
Quality: LEMON	Quality: LEMON
Value: 61	Value: 62
Durability: 50	Durability: 50
Weight: 800	Weight: 800
Popularity: 1.0	Acceleration: 25.0
Acceleration Modifier: 1.0	
Speed Modifier: 1.0	
Handling Modifier: 1.0	
Braking Modifier: 1.0	

Cars for sale:

r4s
id: r4s | Durability: 50 | Value: 454 | Quality: LEMON | Weight: 4000

Purchasing individual component from Shop

 **TRN_SeaHag** Yesterday at 2:08 AM
!r shop chopshop buy 8r8

 **DemoBot** BOT Yesterday at 2:08 AM
Transaction complete! New Credit balance: 6498

ENGINE

Quality:


lemon

Durability: Value: Weight:

50/50 81 800

Speed:

25.0



Race event being generated


Nostra Today at 12:28 AM
!r event generate


Nostra bot BOT Today at 12:28 AM


Upcoming Event

New Event created successfully!


Event ID	Total Nodes	Distance
jeisfl	18	17338







 Reward Potential


Event view

 **sabs21** Yesterday at 8:06 PM
!r event view

 **Racing Bot** BOT Yesterday at 8:06 PM
ID: bxw24r
PRIZE: 4500
TRACK INFO:
TRACK LENGTH: 4491ft
Straight: 436ft long
Corner: 564ft long | difficulty: EASY
Straight: 190ft long
Corner: 1313ft long | difficulty: MEDIUM
Straight: 939ft long
Corner: 1049ft long | difficulty: HARD

Race in progress (text)

 **sabs21** Yesterday at 8:44 PM
!r event begin

 **Racing Bot** BOT Yesterday at 8:44 PM

1. | Driver: jack | 3 of 18 | Distance: 760 / 1646 | Current state: Normal
2. | Driver: nick | 1 of 18 | Distance: 374 / 898 | Current state: Defensive

1. | Driver: jack | 4 of 18 | Distance: 95 / 1774 | Current state: Defensive
2. | Driver: nick | 1 of 18 | Distance: 800 / 898 | Current state: Defensive

1. | Driver: jack | 4 of 18 | Distance: 781 / 1774 | Current state: Defensive
2. | Driver: nick | 3 of 18 | Distance: 241 / 1646 | Current state: Defensive

1. | Driver: jack | 4 of 18 | Distance: 1560 / 1774 | Current state: Defensive
2. | Driver: nick | 3 of 18 | Distance: 610 / 1646 | Current state: Defensive


Race end (time completed is 0 because of "Did not finish")


RaceEvent Or4uq9 is complete!

—

1. | Driver: jack (x7sdca) | Time Completed: 17
2. | Driver: nick (f6t12t) | Time Completed: 0

Claiming credits after race is over

 **Nostra** Today at 12:41 AM
!r claim

 **Nostra bot** BOT Today at 12:41 AM
Claimed 14790 credits. jack2 took their cut of 2610 credits from the total winnings of 17400 credits

Repairing components after race

