

# CSE 1325

Week of 08/22/2022

Instructor : Donna French

# Canvas and Email

- I use Canvas for everything.
  - Any material presented in class will be posted on Canvas
    - Slides
    - Code examples
- I use email A LOT
  - I expect that you will check your UTA/Canvas email at least once per day
  - If you send me an email, you can expect to hear back from me within 24 hours or less unless I have announced that I will specifically be out of touch.

# Homework

- Homework will be assigned on Mondays at noon and will be due the following Monday by midnight.
- Homework will usually consist of questions covering the previous week's lectures.
- Any homework submitted within 24 hours after the due date will incur a 50% penalty but 50% is better than 0%.
- Homework questions are taken directly from the slides, class discussion and coding assignments.
- Homework will appear in Canvas as “Quizzes” in order to make use of Canvas’s ability to automatically grade that type of submission.
- Completing and understanding the homework will prepare you for the exams.
- Homework is 8% of your grade.

# Crash Course

- Crash Course video quizzes will be assigned on Mondays at noon and will be due the following Monday by noon.
- Any quizzes submitted within 24 hours after the due date will incur a 50% penalty but 50% is better than 0%.
- Quiz questions are taken directly from the videos. I highly suggest you turn on Closed Captioning to get exact phrasing and spelling.
- Crash Course quizzes will appear in Canvas as “Quizzess” in order to make use of Canvas’s ability to automatically grade that type of submission.
- The purpose of the quiz is to verify that you have watched the video – not to test how much you already know; therefore, alternate terms will not be accepted even though they may be correct.
- This should be an easy 100% every time.

# Coding Assignments

- Coding Assignments will be assigned on Mondays at noon and will be due the following Monday by noon.
- Some of the assignments will build on the previous week's assignment. They will start out easy and will get progressively harder.
- Turn in early and ask me to review. Email me what you have and ask questions. Don't get stuck.
- Coding Assignments will be graded by your assigned GA. They will use the provided rubric to grade your programs. Review the rubric yourself before submitting your final version. **Code that does not compile or compiles with warnings will automatically receive a grade of 0.**
- Google is not your friend
  - Ask Google – find a thousand places to look
  - Ask your professor – find the right place to look

# OnLine Quizzes

Weekly quizzes will make up 70% of your overall grade.

These quizzes will test your ability to read and write code.

OLQs will cover material from class and coding assignments.

The best way to study for the OLQs is to do the Coding Assignments and **understand** them.

OLQs will be open every Tuesday from 6PM to Wednesday at midnight and will take 30-60 minutes.

# Final Exam

The Final Exam is 10% of your overall grade.

The Final Exam will be the same type of 2.5 hour exam that would be given in person.

The 2.5 hour exam will be broken up into 5 thirty minute quizzes called FEQs (Final Exam Quizzes).

Each FEQ will represent a portion of what would have been the Final Exam in person.

# Code Formatting

Formatting will count as 10% of the grade for any code you write in this class – Coding Assignments or OLQs.

## Indentation and alignment

Code blocks should be indented at least 3 spaces and not more than 5 spaces

If tabs are used, always use tabs and set tab size to be 3-5 spaces

If spaces are used, always use spaces and always use the same number of them

Curly braces { } should align vertically and be on their own line

```
A
{
    B;
    C
    {
        D;
    }
}
```

# Code Formatting

Code formatting has several benefits

- allows quick readability – it is easier/faster to understand the gross structure of the code without in depth examination
- allows for less reliance on the editor to match up braces and code blocks
- creates readable code that is easier for someone other than the student to read – for example, when the student is asking the instructor or TAs for assistance
- allows for easier grading of code – both the instructor and student benefit – code that is easier to grade is less likely to be marked as incorrect
- gives the students the experience of applying a given formatting standard which they will likely encounter as a professional programmer

# Expectations

What I expect from you...

- Attend class and be on time
- Actively participate in class – be present
- Do your own work and submit on time
- Ask for help when needed

What you should expect from me...

- I will be fair to all of you
- I will grade/return work in a timely manner
- I will help when asked
- I will let you know as soon as possible when something changes
- I will do what I say I'm going to do
- I will let you know what I want you to do and be as clear as possible about it
- I will never purposely make you feel dumb

<https://mavsuta.sharepoint.com/sites/cse13xx>

The screenshot shows a SharePoint site interface. At the top, there's a navigation bar with 'SharePoint' on the left, a search bar containing 'Search this site', and icons for notifications, settings, help, and a user profile on the right. Below the bar, the site title 'cse13xx' is displayed next to a green square icon with a white letter 'C'. To the right of the title are 'Not following' and 'Share' buttons. The main content area has a header with 'Home', 'New', 'Page details', 'Analytics', and 'Published 1/11/2022' along with edit and back/forward buttons. On the left, a vertical navigation menu lists 'CSE 1310', 'CSE 1320', 'CSE 1325', 'VM Download', 'VM Information', 'CSE 1310 Benchmarks', 'CSE 1310 Placement Exam', 'Recycle bin', and 'Edit'. The main content area features a large heading 'Welcome to CSE 1310, CSE 1320 and CSE 1325!'. Below it, a text block states: 'On this site, you will find links to each course's Home Page and links to the Lab Schedules/Office Hours for each course. The Home Page of each course will list specific information about that course.' Further down, a section titled 'Getting Help from the GTAs/TAs' contains text about TA/GTA support during office hours.

SharePoint Search this site Not following Share

cse13xx

Home New Page details Analytics Published 1/11/2022 Edit

CSE 1310

CSE 1320

CSE 1325

VM Download

VM Information

CSE 1310 Benchmarks

CSE 1310 Placement Exam

Recycle bin

Edit

## Welcome to CSE 1310, CSE 1320 and CSE 1325!

On this site, you will find links to each course's Home Page and links to the Lab Schedules/Office Hours for each course. The Home Page of each course will list specific information about that course.

### Getting Help from the GTAs/TAs

Every course/section has a Graduate Teaching Assistant (GTA) or undergraduate Teaching Assistant (TA) who holds office hours to provide support to the students by helping with coding assignments and questions over material from class. You are welcome to visit the TA/GTA from **any** section of your course if you have general questions, but, if you have more specific assignment questions, please look for your specific GTA in the schedule and visit with them during their working hours.

## Getting Help from the GTAs/TAs

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Due to the current circumstances, no in-person lab times are available - everything is online. Please download the Teams apps (the web version does not support screenshare) so that you can use screen share and/or chat with the GTAs/TAs. Consult the lab schedule for your course to determine what time a TA/GTA will be on duty for your course. You can then use the Chat feature of Microsoft Teams to contact the on duty TA/GTA (use their name in the Search box in Teams) and you will be able to share your screen with them and discuss your questions/issues.

**Please make sure you are contacting the TA/GTA using their @mavs.uta.edu Teams address and not their @uta.edu. Some of the TAs/GTAs have both email addresses, but only monitor/use their @mavs.uta.edu. When you type the name into the Search box of Teams, pick the name labeled with Student or no label - do not pick the entry labeled as Enhanced GTA or Resident Assistant or STEM Graduate Teaching Assistant for example.**

If you cannot contact a TA/GTA during their scheduled work times, please fill out this [form](#) with the date and time and which TA/GTA you were unable to contact. Please include what information you used to contact them.



cse13xx

Not following Share



Home

+ New

Send to

Promote

Page details

Immersive Reader

...

Published 8/3/2022

Edit



CSE 1310



CSE 1320



CSE 1325

VM Download

VM Information

CSE 1310 Benchmarks

CSE 1310 Placement Exam

Recycle bin

Edit

# CSE 1325

French, Donna Marjorie  
SENIOR LECTURERCSE 1325 Student  
Learning OutcomesCSE 1325 GTA  
Schedule

## Lab Information

All lab hours will be online in Microsoft Teams.

The lab schedule is always subject to change, and the schedule may be different each week. If you plan to contact a TA/GTA, please check the current date to make sure you see the most up-to-date schedule. Type the TA's name into the Search box of Teams. Send your instructor an e-mail if you have any trouble contacting a TA/GTA during their schedule office hours.

CSE 1325 students are welcome to contact a TA/GTA any time during the posted lab hours. During posted hours, teaching assistants (TAs/GTAs) will be available to help students with the course material. Any CSE

is welcome to seek help from any teaching assistant, regardless of the CSE 1325 section that the

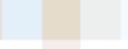
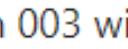
## Lab Information

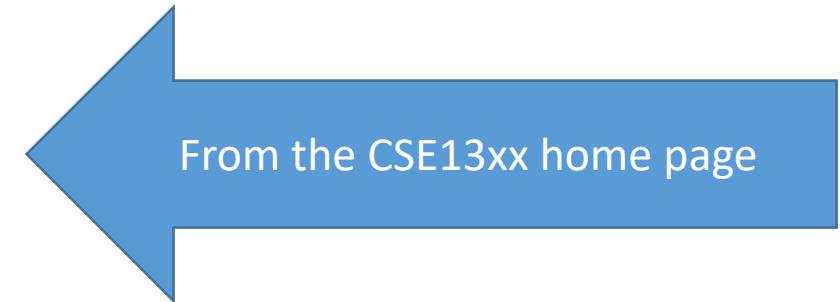
All lab hours will be online in Microsoft Teams.

The lab schedule is always subject to change, and the schedule may be different each week. If you plan to contact a TA/GTA, please check the current date to make sure you see the most up-to-date schedule. Type the TA's name into the **Search** box of Teams. Send your instructor an e-mail if you have any trouble contacting a TA/GTA during their schedule office hours.

CSE 1325 students are welcome to use contact a TA/GTA any time during the posted lab hours. During posted hours, teaching assistants (TAs/GTAs) will be available to help students with the course material. Any CSE 1325 student is welcome to seek help from any teaching assistant, regardless of the CSE 1325 section that the teaching assistant is assigned to.

This is the list of TAs with assigned office hours:

- Section 001 with 
  - 
- Section 002 with 
  - 
- Section 003 with 
  - 
- Section 004 with 
  - 



CSE 1325

VM Download

VM Information

CSE 1310 Benchmarks

CSE 1310 Placement Exam

French, Donna Marjorie  
SENIOR LECTURER

CSE 1325 Student Learning Outcomes

CSE 1325 GTA Schedule

BROWSE EVENTS CALENDAR

SHARE FOLLOW



EDIT LINKS

Search this site



# CSE 1325 Lab Schedule

◀ 2022 ▶

Jan

Feb

Mar

Apr

May

Jun

Jul

Aug

Sep

Oct

Nov

Dec

Today is Sunday, August 21, 2022

Calendars in View

CSE 1325 Lab Schedule

Home

CSE 1310

CSE 1320

CSE 1325

VM Download

VM Information

CSE 1310 Benchmarks

CSE 1310 Placement Exam

Recent

◀ ▶ August 2022

SUNDAY

MONDAY

TUESDAY

WEDNESDAY

THURSDAY

FRIDAY

SATURDAY

31

1

2

3

4

5

6

7

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28

29

30

31

1

2

3



# OLQ1

- Quiz needs to be taken between 6PM Tuesday and midnight Wednesday.
- You can take the quiz multiple times.

The screenshot shows a course navigation menu with 'OLQ' selected. Below it, a specific quiz announcement is displayed. The announcement has a green vertical bar on the left and includes a rocket ship icon, the title 'OLQ1 - Requires Respondus LockDown Browser + Webcam', the due date 'Sep 1', and the point value '100 pts'.

⋮ ▾ OLQ

⋮ OLQ1 - Requires Respondus LockDown Browser + Webcam  
Sep 1 | 100 pts

# OLQ1 - Requires Respondus LockDown Browser + Webcam ↗

OLQ1

## Quiz Instructions

This quiz serves two purposes

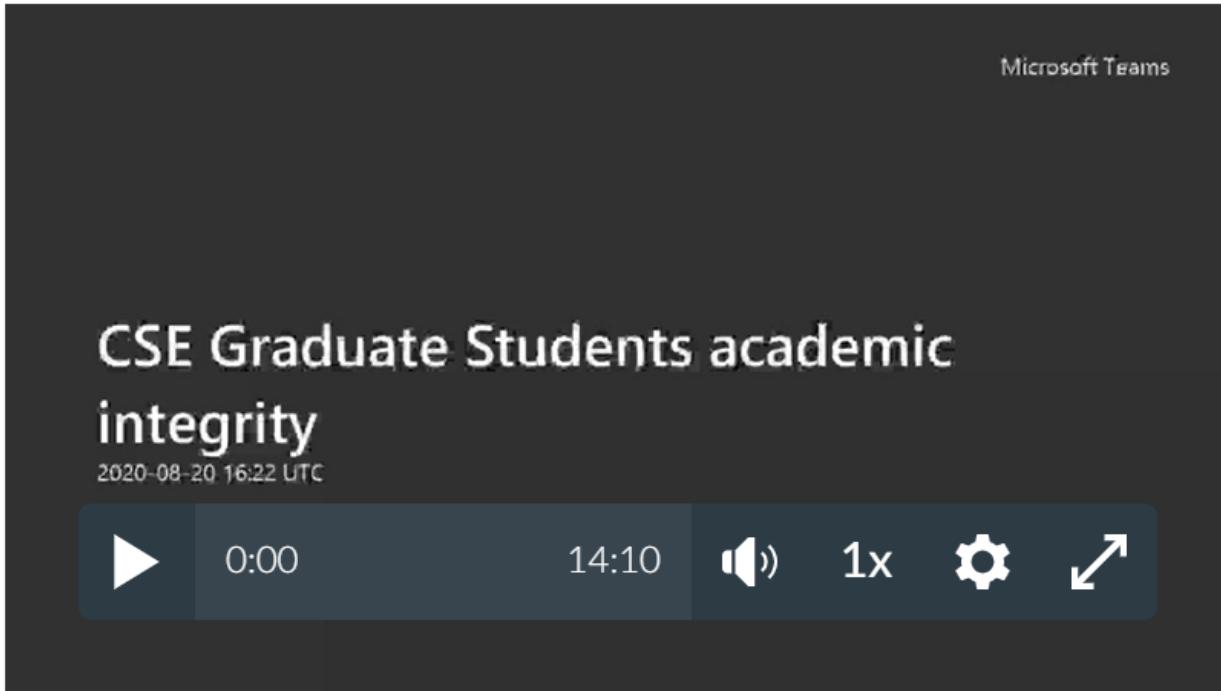
- provides an opportunity for you to try some activities in LockDown Browser with Monitor before an actual quiz.
- informs you of the university's academic integrity policies

Please watch this video by Dan Moore who is the Associate Director for Academic Integrity with the Office of Student Conduct. The video was original recorded for new CSE Graduate students but the information applies to all CSE students.

You will be asked several questions related to the video to demonstrate that you watched the video in its entirety.

You should take this quiz as many times as needed to get a 100%. You will be expected to be able to use these skills on the next quiz where you won't be able to take the quiz more than once.

OLQ1



By completing this quiz,

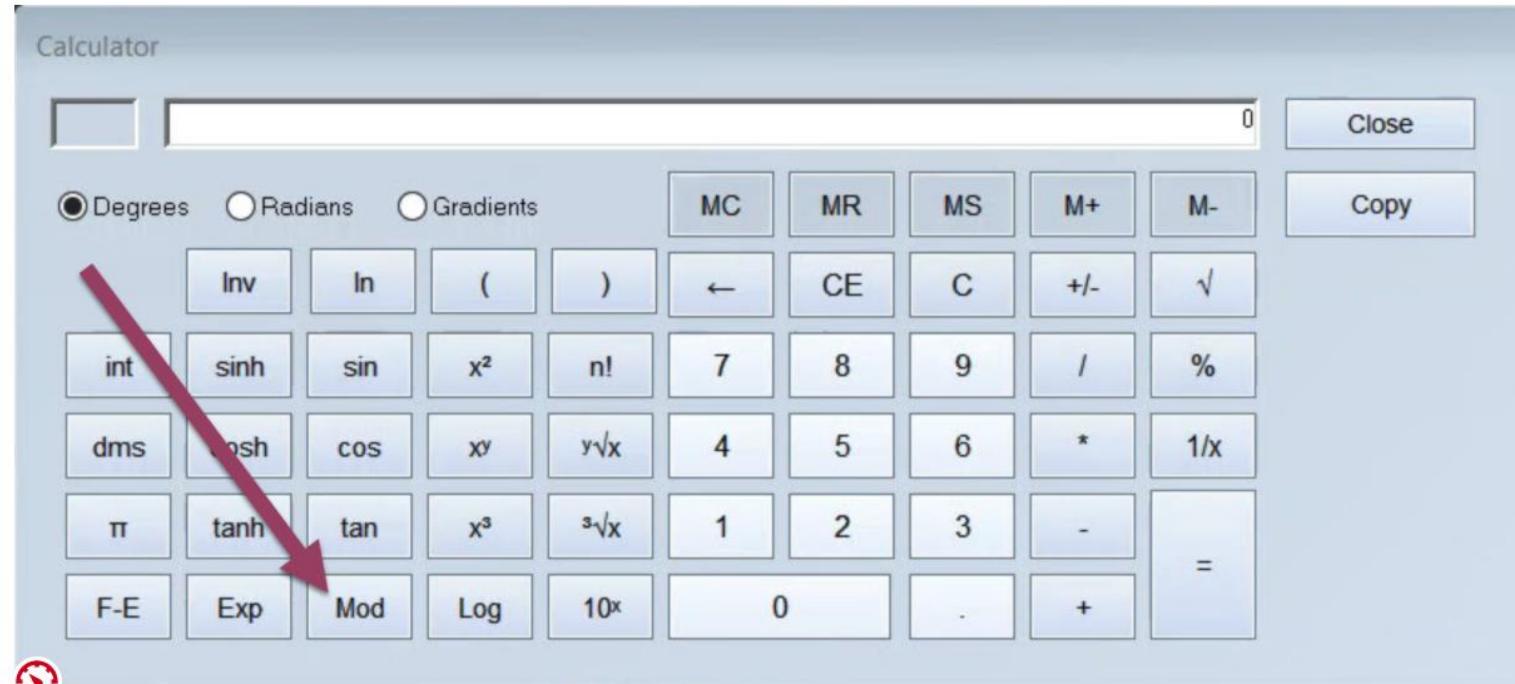
- you are acknowledging your awareness of UTA's academic honesty policies
- you are able to use LockDown Browser with Monitor and will be prepared for the first required usage
- you are able to find and use the scientific calculator in LockDown Browser

## Question 1

25 pts

OLQ1

Using the scientific calculator, what is 9,493,838 MOD 17?



**Question 2**

25 pts

Students who provide their code to other students, whether directly or indirectly (posting on the web, for example), are subject to the same academic honesty violation of collusion as the student who used the code.

---

 True

---

 False

**Question 3****25 pts**

Several classmates work together on a specific approach to solving a coding assignment and they all use that specific approach to code their programs. The instructor has stated that all assignments in the class are individual and not group assignments.

This situation is not an example of collusion since they all wrote their own code.

---

 True

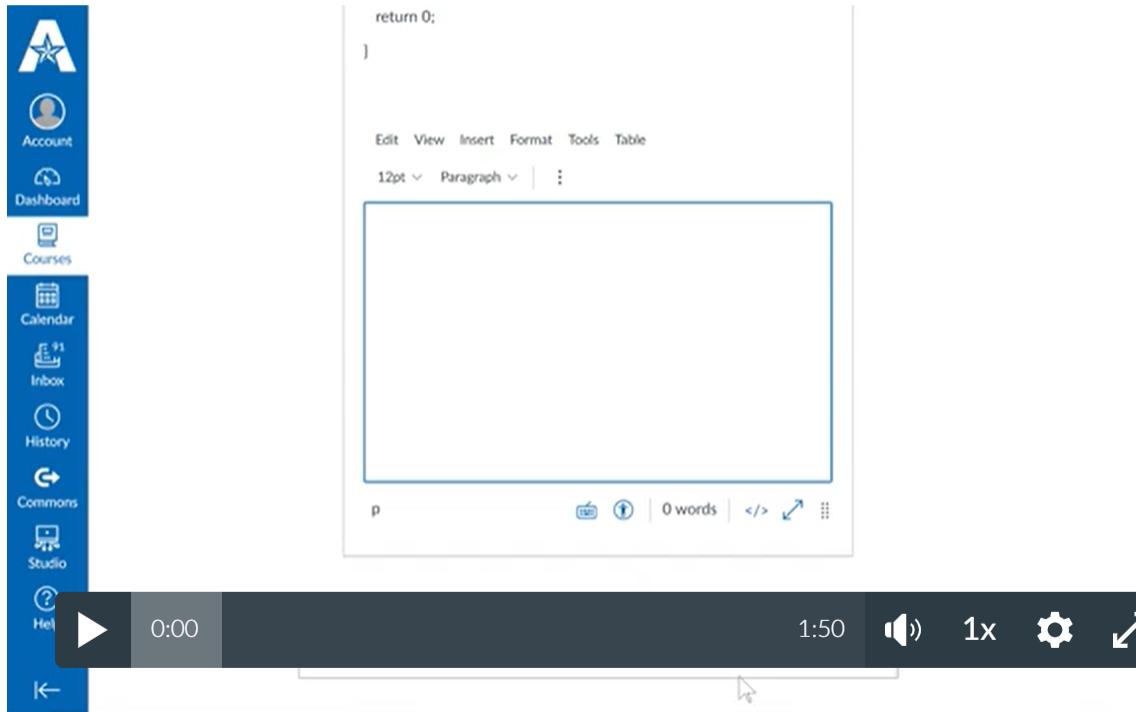
---

 False

## Question 4

25 pts

Watch this video on how to format your coding answers.



OLQ1

After watching the video, type the following code and format it as required as your answer.

```
int main(void)
```

```
{
```

```
    printf("Hello");
```

```
    return 0;
```

```
}
```

**NOT USING PREFORMATTED FONT  
WHEN WRITING CODE ON QUIZZES  
WILL BE AN AUTOMATIC 5 POINT  
PENALTY!!**

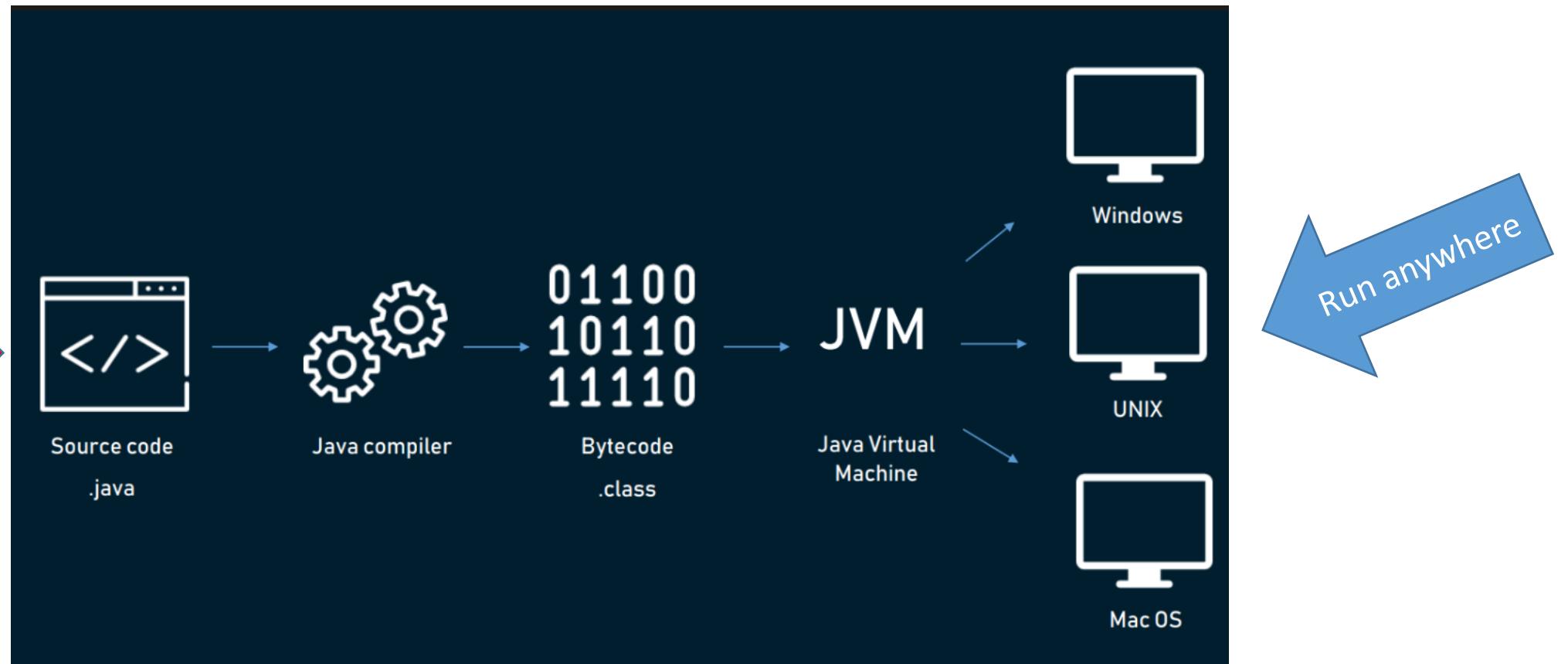
Edit View Insert Format Tools Table

12pt ▾ Paragraph ▾ B I U A ▾ T<sup>2</sup> ▾ :

# Java

- Java is case sensitive
    - main
    - Main
    - MAIN
  - You will save your Java program into a file with a .java extension.
  - The Java compiler translates source code into class files that contain instructions for the Java Virtual Machine (JVM).
- 
- Not the same!!!

# From Source Code to Running Program





# Installing JDK

<https://www.oracle.com/java/>

The screenshot shows the Oracle Java homepage. At the top, there's a navigation bar with links for Products, Industries, Resources, Customers, Partners, Developers, and Events. To the right of the navigation are search, account, and contact buttons. Below the navigation, the word "Java" is prominently displayed in large white letters. A descriptive paragraph highlights Java's status as the #1 programming language and development platform, mentioning its cost reduction, innovation, and widespread use by millions of developers worldwide. A "Download Java" button is located on the right side. The background features a stylized illustration of three people interacting with spheres on a grid.

ORACLE

Products Industries Resources Customers Partners Developers Events

View Accounts Contact Sales

Java

Oracle Java is the #1 programming language and development platform. It reduces costs, shortens development timeframes, drives innovation, and improves application services. With millions of developers running more than 51 billion Java Virtual Machines worldwide, Java continues to be the development platform of choice for enterprises and developers.

Assess the health of your Java environment

Download Java

Java &gt; Technical Details &gt;

# Java Downloads

[Java downloads](#)   [Tools and resources](#)   [Java archive](#)**Looking for other Java downloads?**[OpenJDK Early Access Builds](#)[JRE for Consumers](#)

## Java 18 and Java 17 available now

Java 17 LTS is the latest long-term support release for the Java SE platform. JDK 18 and JDK 17 binaries are free to use in production and free to redistribute, at no cost, under the [Oracle No-Fee Terms and Conditions](#).

[Learn about Java SE Subscription](#)

JDK 18 will receive updates under these terms, until September 2022 when it will be superseded by JDK 19

JDK 17 will receive updates under these terms, until at least September 2024.

[Java 18](#)   [Java 17](#)

## Java SE Development Kit 18.0.2.1 downloads

Thank you for downloading this release of the Java™ Platform, Standard Edition Development Kit (JDK™). The JDK is a development environment for building applications and components using the Java programming language.

The JDK includes tools for developing and testing programs written in the Java programming language and running on the Java platform.

[Java downloads](#)   [Tools and resources](#)   [Java archive](#)

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The JDK includes tools for developing and testing programs written in the Java programming language and running on the Java platform.

[Linux](#)   [macOS](#)   [Windows](#)

Product/file description	File size	Download
x64 Compressed Archive	172.93 MB	<a href="https://download.oracle.com/java/18/latest/jdk-18_windows-x64_bin.zip">https://download.oracle.com/java/18/latest/jdk-18_windows-x64_bin.zip</a> (sha256
x64 Installer	153.45 MB	<a href="https://download.oracle.com/java/18/latest/jdk-18_windows-x64_bin.exe">https://download.oracle.com/java/18/latest/jdk-18_windows-x64_bin.exe</a> (sha256
x64 MSI Installer	152.33 MB	<a href="https://download.oracle.com/java/18/latest/jdk-18_windows-x64_bin.msi">https://download.oracle.com/java/18/latest/jdk-18_windows-x64_bin.msi</a> (sha256

### JDK Script-friendly URLs

The URLs listed above will remain the same for JDK update releases to allow their use in scripts.

[Learn more about automating the downloads of JDK](#)

Latest release

# Apache NetBeans 14

[Download](#)

## Apache NetBeans Fits the Pieces Together

Development Environment, Tooling Platform and Application Framework.

### Fast & Smart Editing

Apache NetBeans is much more than a text editor. It highlights source code syntactically and semantically, lets you easily refactor code, with a range of handy and powerful tools.

### Java, JavaScript, PHP, HTML5, CSS, and More

Apache NetBeans provides editors, wizards, and templates to help you create applications in Java, PHP and many other languages.

### Cross Platform

Apache NetBeans can be installed on all operating systems that support Java, i.e., Windows, Linux, Mac OSX and BSD. Write Once, Run Anywhere, applies to NetBeans too.

### Join us

Subscribe to our mailing lists, or follow us in Twitter, Slack, FaceBook or YouTube.

### Participate

See how you can participate by submitting pull requests, filing issues, or joining the NetCAT program.

### Learn

We are currently reviewing the tutorials. See how you can help us review the Java and PHP tutorials.

# Downloading Apache NetBeans 14

Apache NetBeans 14 was released on June 9, 2022. Go here on [GitHub](#) for a list of fixed issues for Apache NetBeans 14.

Apache NetBeans 14 is available for download from your closest Apache mirror.

- Binaries: [netbeans-14-bin.zip](#) (SHA-512, PGP ASC)
- Installers:
  - [Apache-NetBeans-14-bin-windows-x64.exe](#) (SHA-512, PGP ASC)
  - [Apache-NetBeans-14-bin-linux-x64.sh](#) (SHA-512, PGP ASC)
  - [Apache-NetBeans-14-bin-macosx.dmg](#) (SHA-512, PGP ASC)
- Source: [netbeans-14-source.zip](#) (SHA-512, PGP ASC)

Officially, it is important that you [verify the integrity](#) of the downloaded files using the PGP signatures (.asc file) or a hash (.sha512 files). The PGP keys used to sign this release are available [here](#).

Apache NetBeans can also be installed as a self-contained [snap package](#) on Linux.

## Community Installers



Individual NetBeans committers may provide additional binary packages as a convenience. While built using the Apache NetBeans release, they are not releases of the Apache Software Foundation. They may include other contents (eg. JDK) under additional license terms.

- [Codelerity / Gj IT packages](#) - Windows, macOS and Linux (.deb / .ApplImage) built with [NBPackage](#). Most include a local JDK runtime for the IDE to run on, for a self-contained out-of-the-box experience (other JDK's may be used for projects).

## Deployment Platforms

The Apache NetBeans 14 binary releases require JDK 11+, and officially support running on JDK 11 and JDK 17.



The current JDKs have an issue on macOS Big Sur, that causes freezes on dialogs. That could be fixed by applying the workaround described at [NETBEANS-5037](#).

[Community Installers](#)

[Deployment Platforms](#)

[Building from Source](#)

[Community Approval](#)

[Earlier Releases](#)



## COMMUNITY-LED DEVELOPMENT "THE APACHE WAY"



We suggest the following site for your download:

<https://dlcdn.apache.org/netbeans/netbeans-installers/14/Apache-NetBeans-14-bin-windows-x64.exe>

Alternate download locations are suggested below.

It is essential that you verify the integrity of the downloaded file using the PGP signature ([.asc](#) file) or a hash ([.md5](#) or [.sha\\*](#) file).

### HTTP

<https://dlcdn.apache.org/netbeans/netbeans-installers/14/Apache-NetBeans-14-bin-windows-x64.exe>

### BACKUP SITE

<https://dlcdn.apache.org/netbeans/netbeans-installers/14/Apache-NetBeans-14-bin-windows-x64.exe>

### VERIFY THE INTEGRITY OF THE FILES

It is essential that you verify the integrity of the downloaded file using the PGP signature ([.asc](#) file) or a hash ([.md5](#) or [.sha\\*](#) file). Please read [Verifying Apache Software Foundation Releases](#) for more information on why you should verify our releases.

Verify the PGP signature using PGP or GPG. First download the [KEYS](#) as well as the [.asc](#) signature file for the relevant distribution.

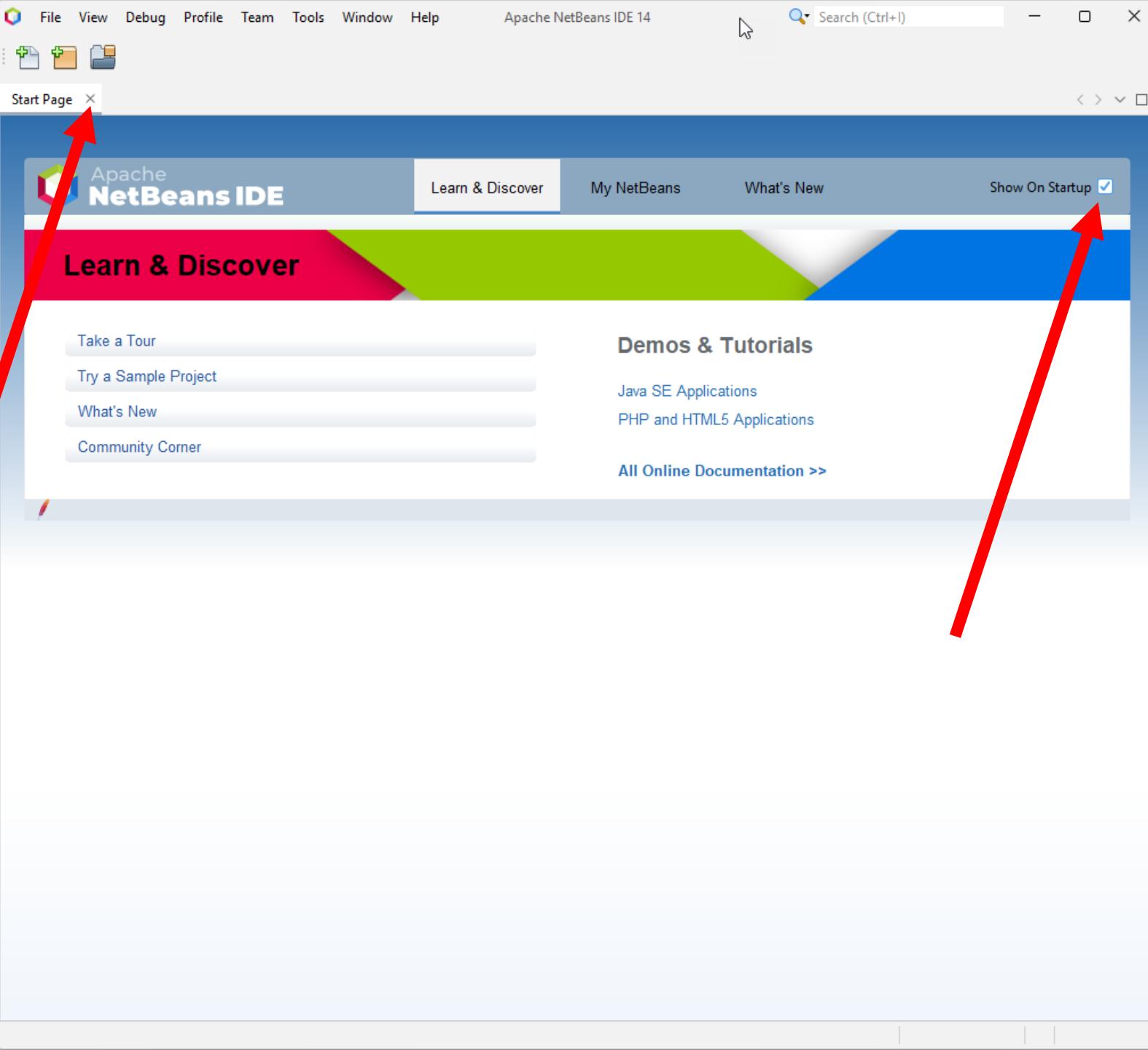
```
% gpg --import KEYS  
% gpg --verify downloaded_file.asc downloaded_file
```

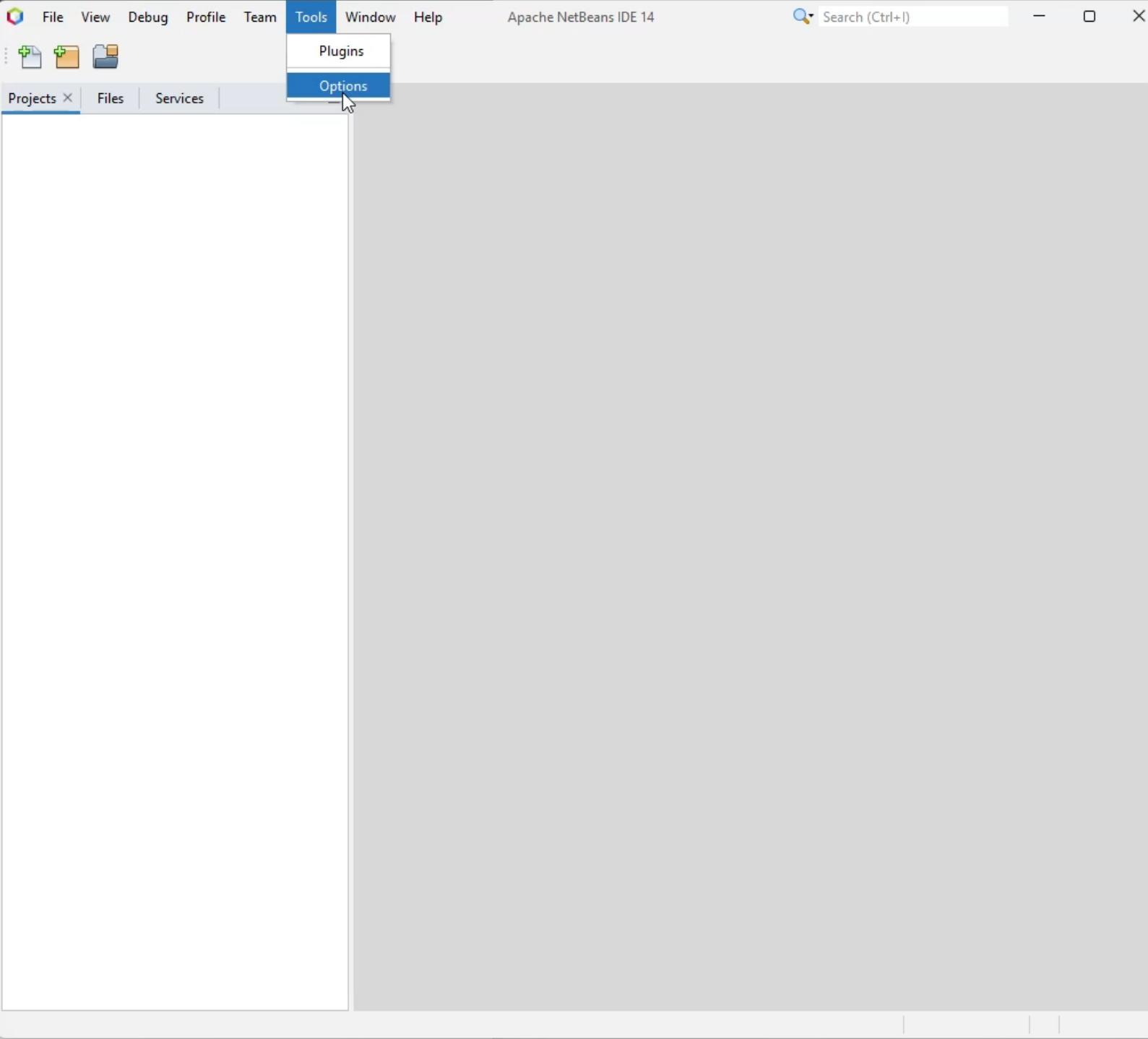
or

```
% pgpk -a KEYS  
% pgpv downloaded_file.asc
```

or

```
% pgp -ka KEYS  
% oep downloaded_file.asc
```





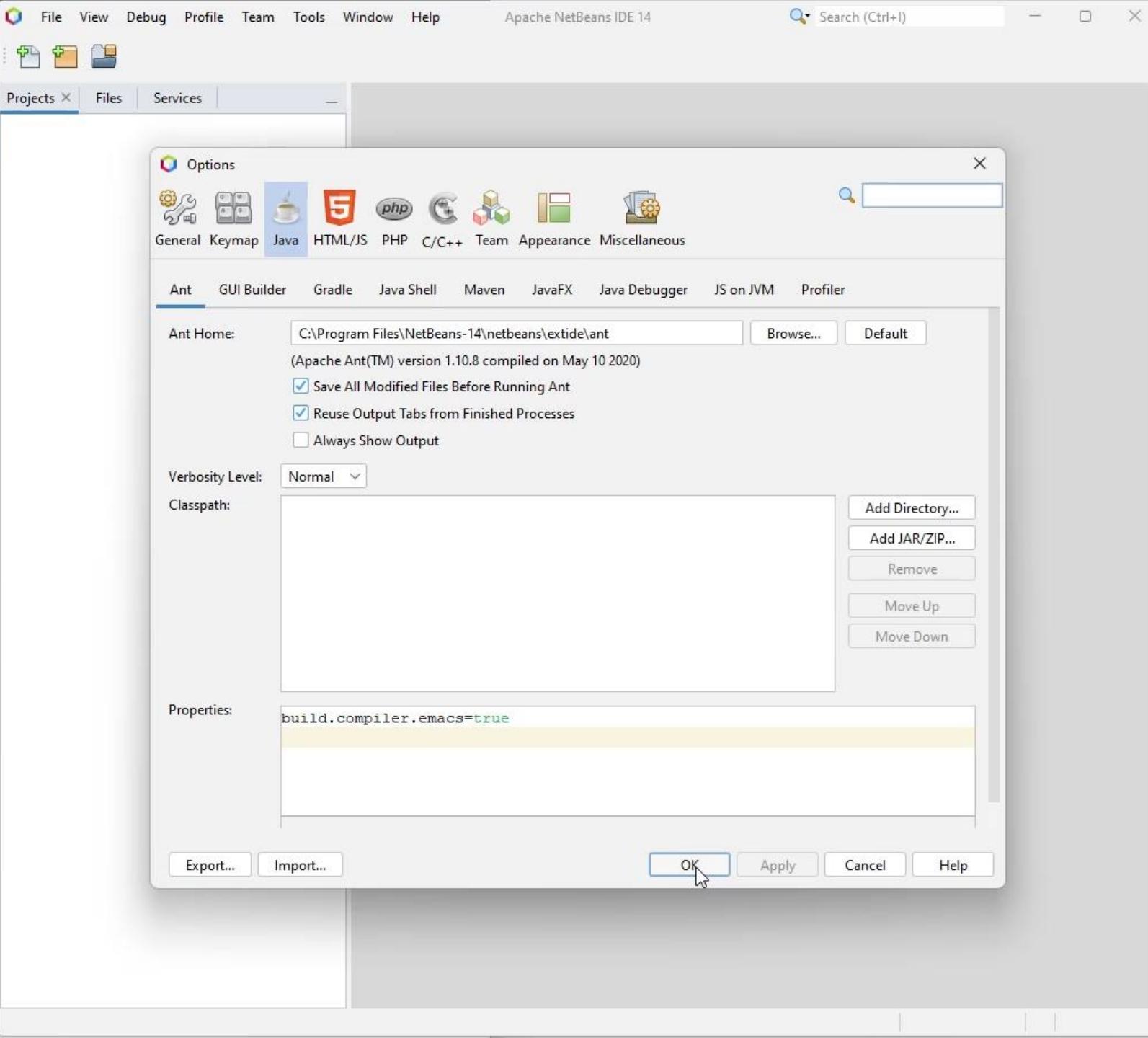
# NetBeans and Mac

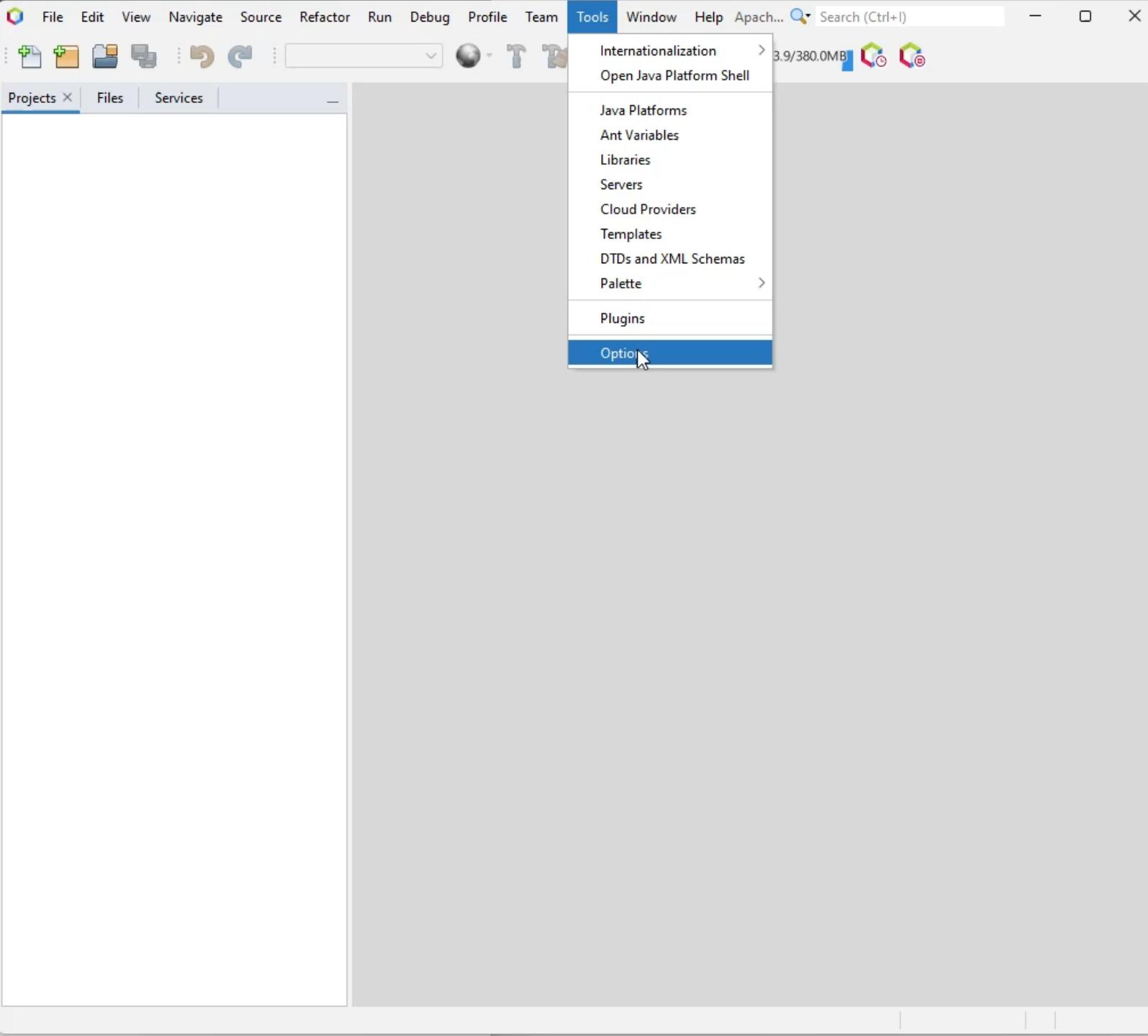
Instead of Tools -> Options

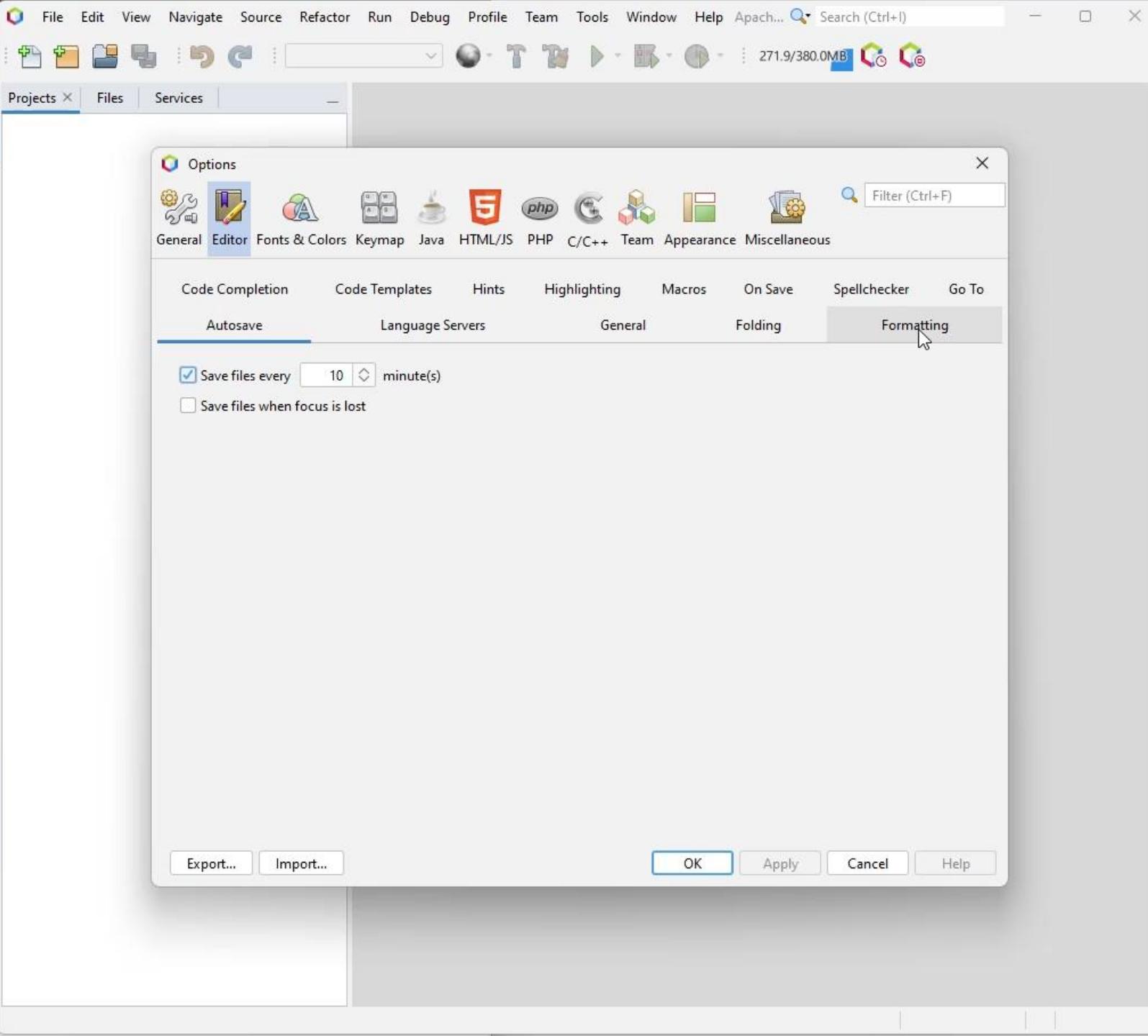
go to

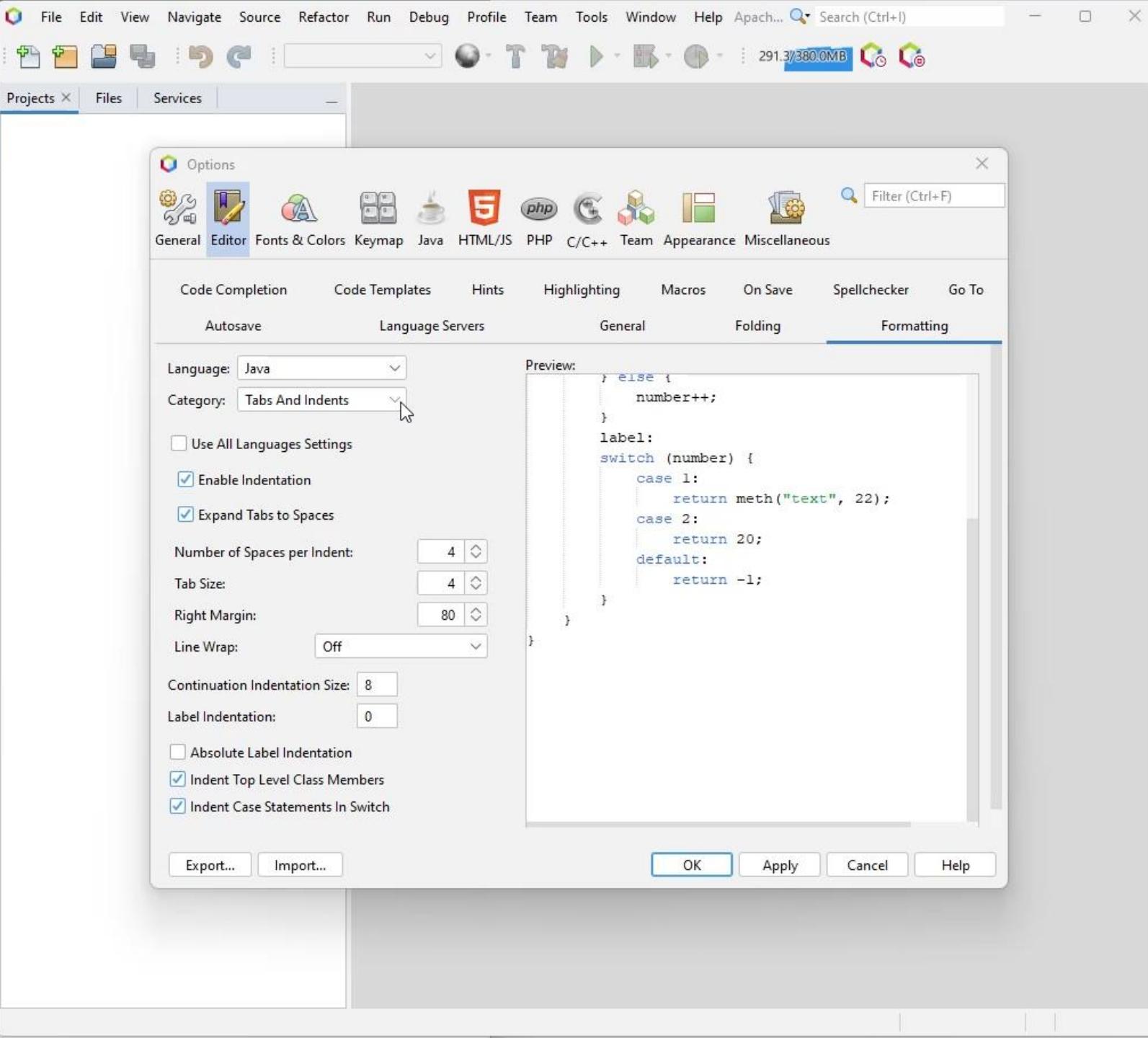
NetBeans - > Preferences

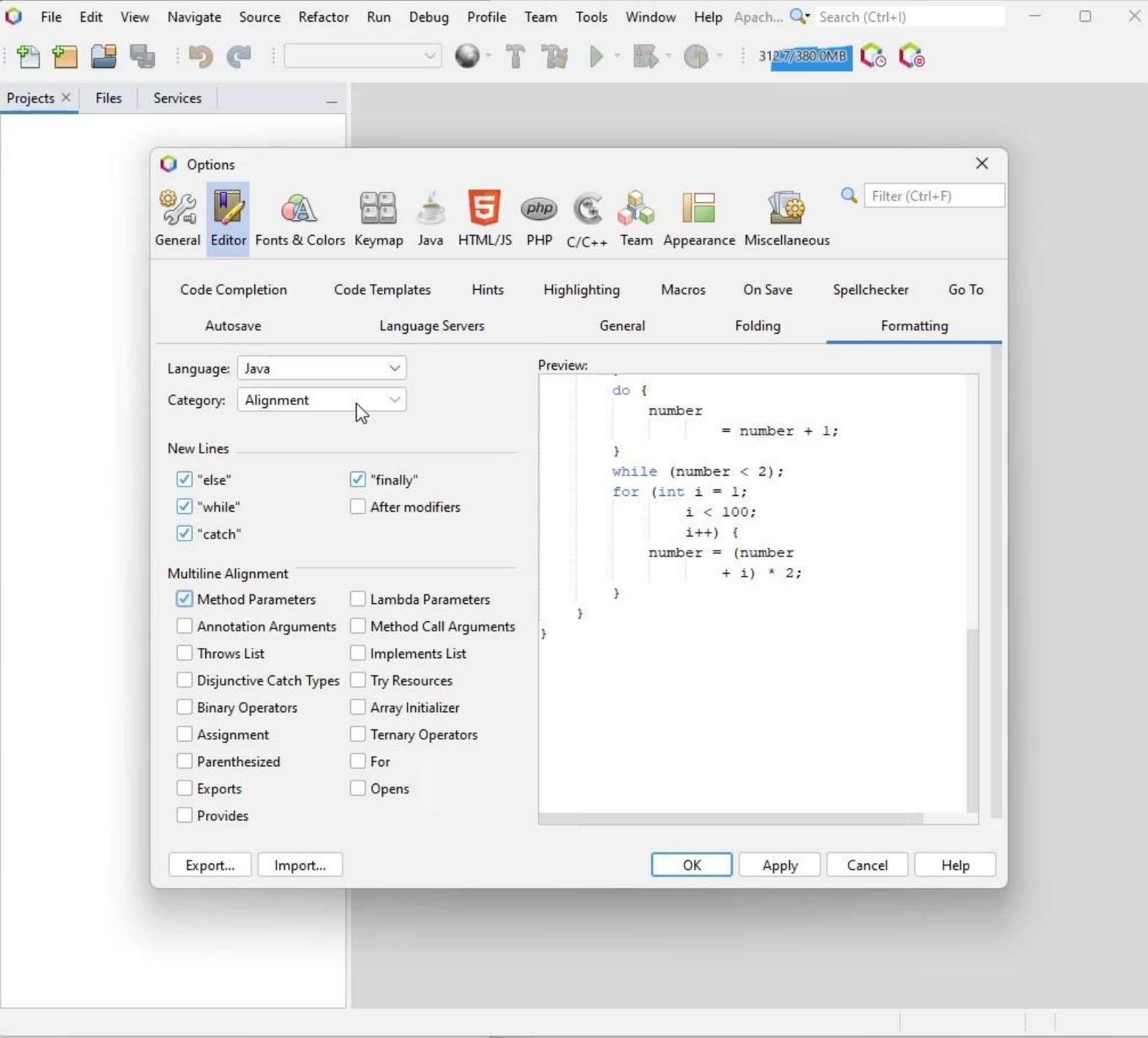
Configuration windows are the same after that

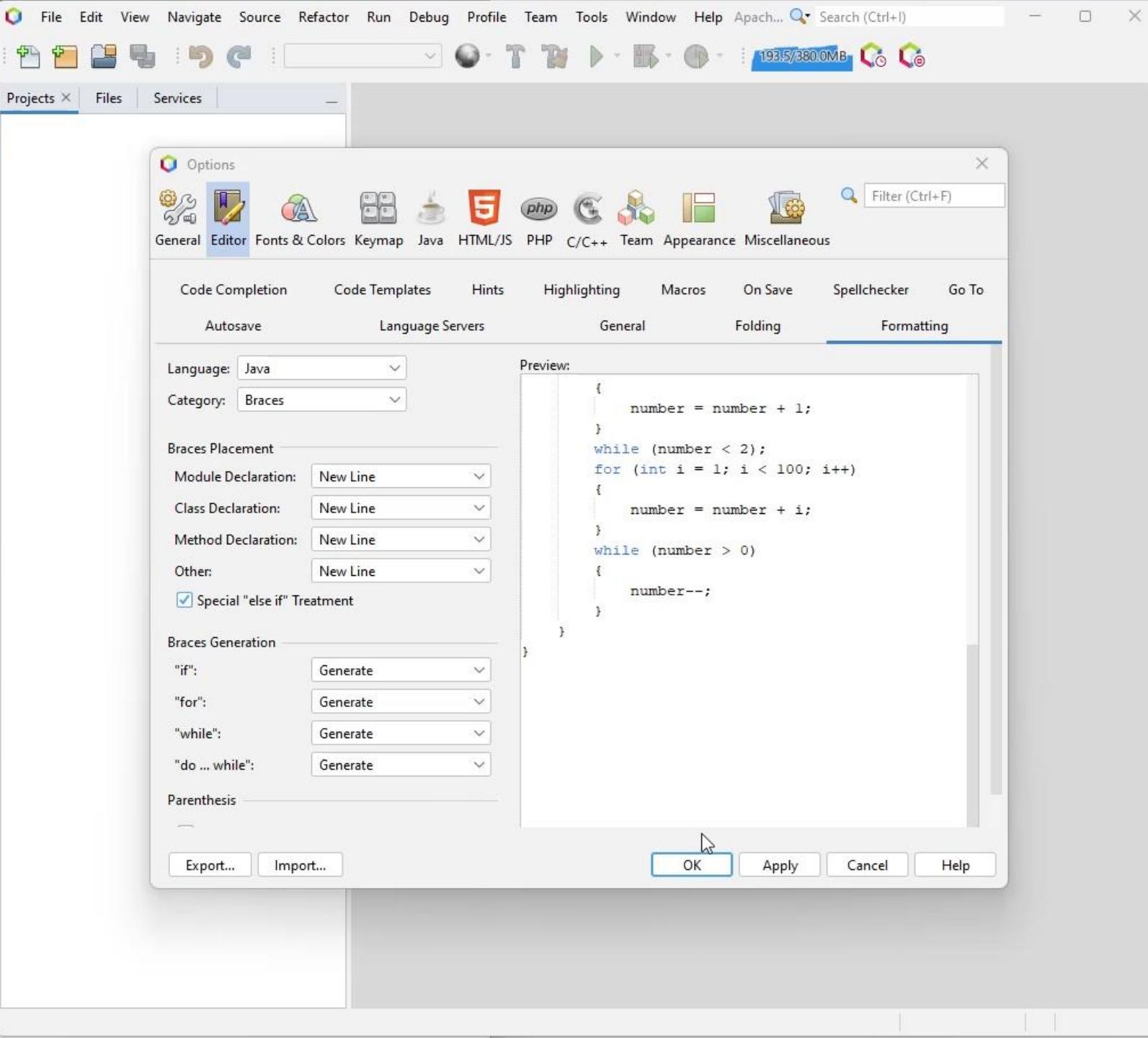


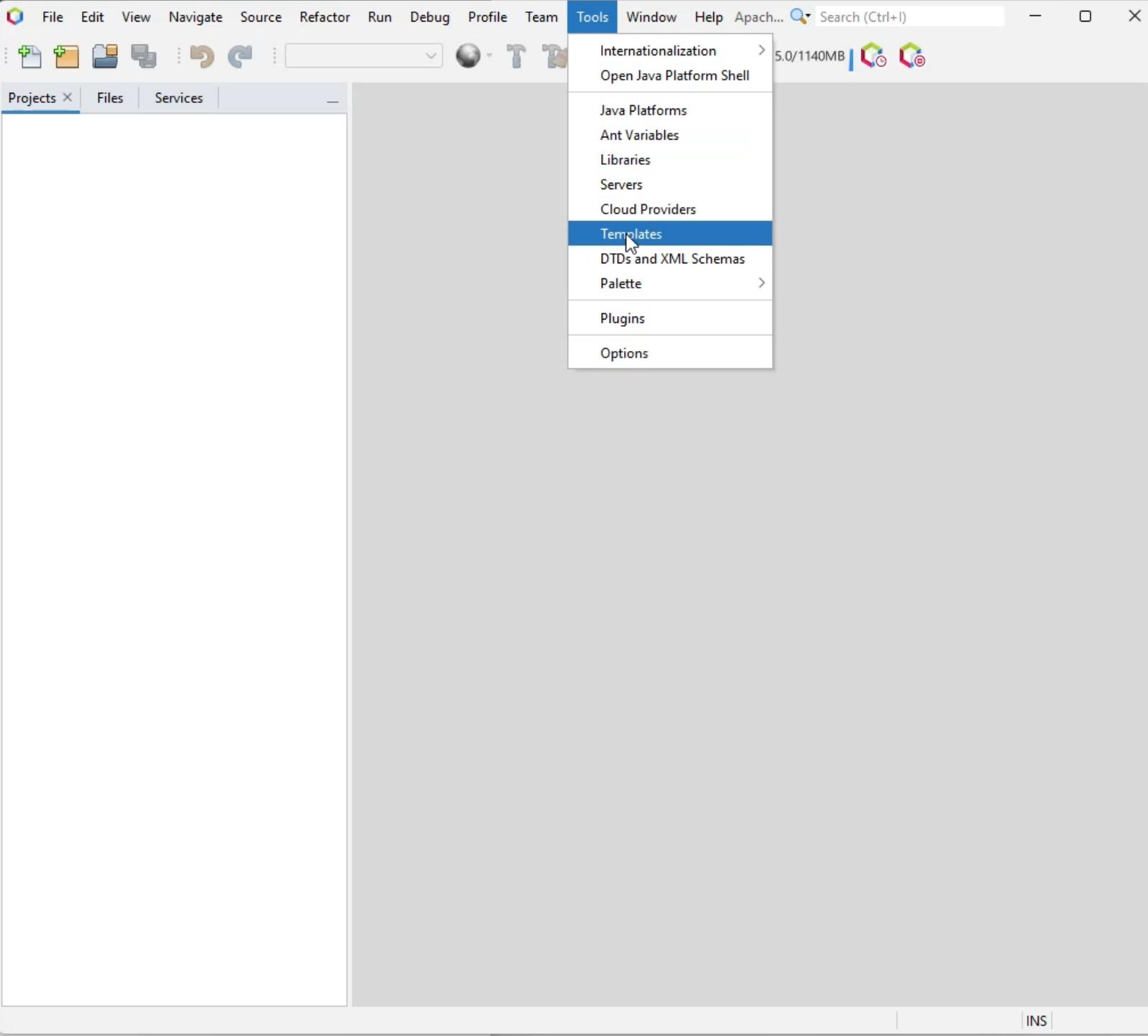


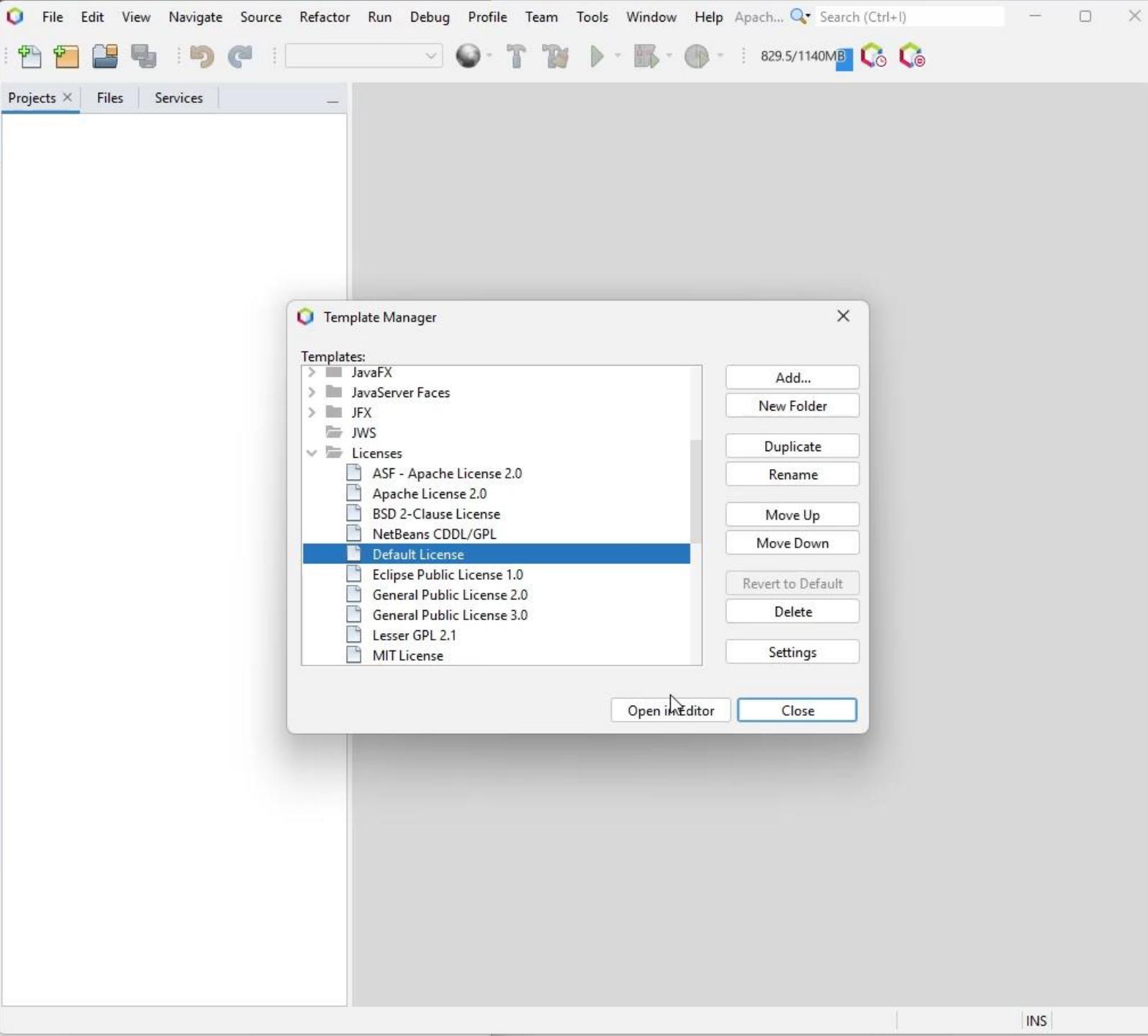












The screenshot shows a software interface, likely a developer's tool, with a menu bar at the top. The menu items include File, Edit, View, Navigate, Source, Refactor, Run, Debug, Profile, Team, Tools, Window, Help, Apache..., and Search (Ctrl+I). Below the menu is a toolbar with various icons. The main workspace has tabs for Projects, Files, and Services, with 'Default License' currently selected. The code editor window displays the following text:

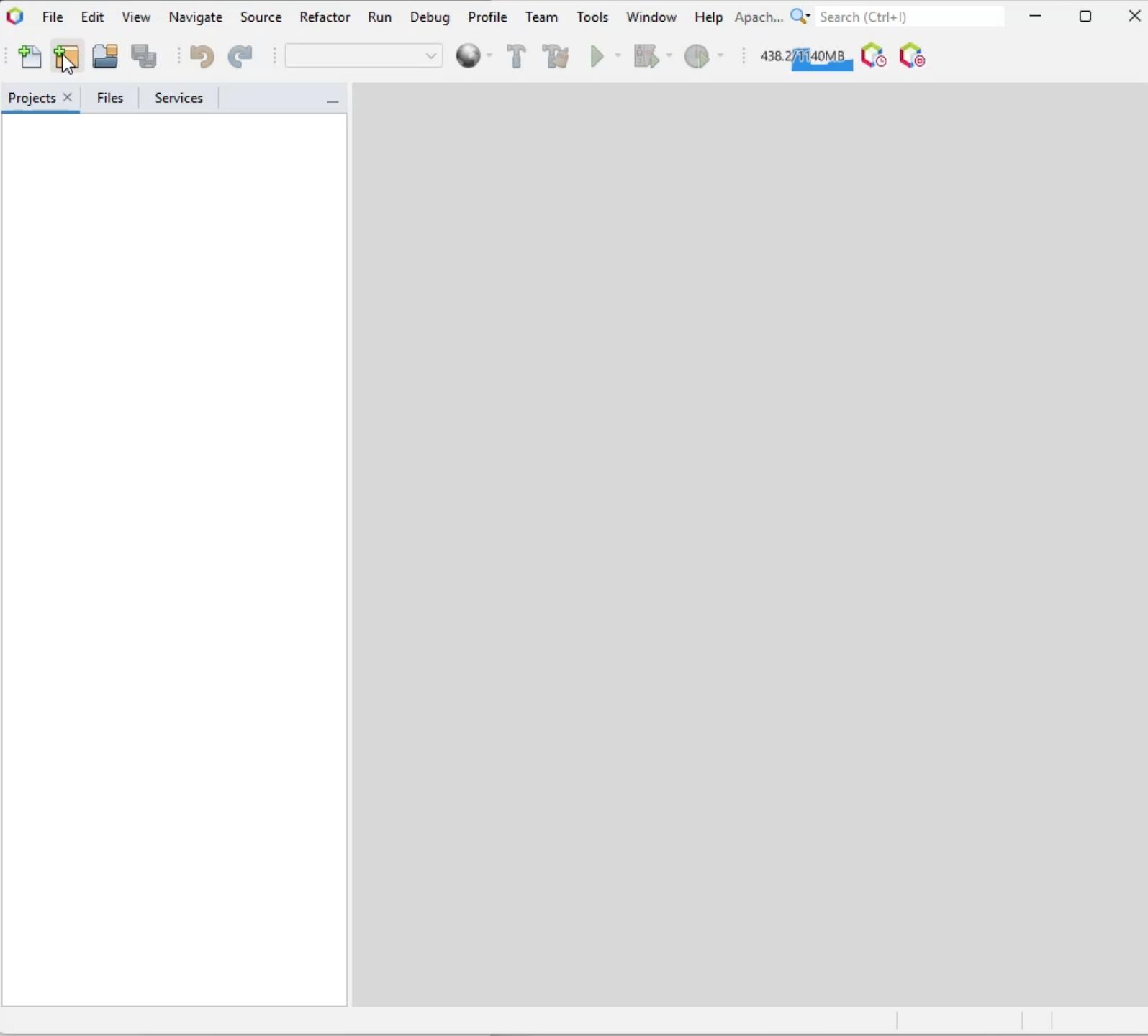
```
Source History
1 ${licenseFirst!""}
2 ${licensePrefix}Click nbfs://nbhost/SystemFileSystem/Templates/Licenses/license-
3 ${licensePrefix}Click nbfs://nbhost/SystemFileSystem/${.data_model["org.openide.+"}
4 ${licenseLast!""}
5
```

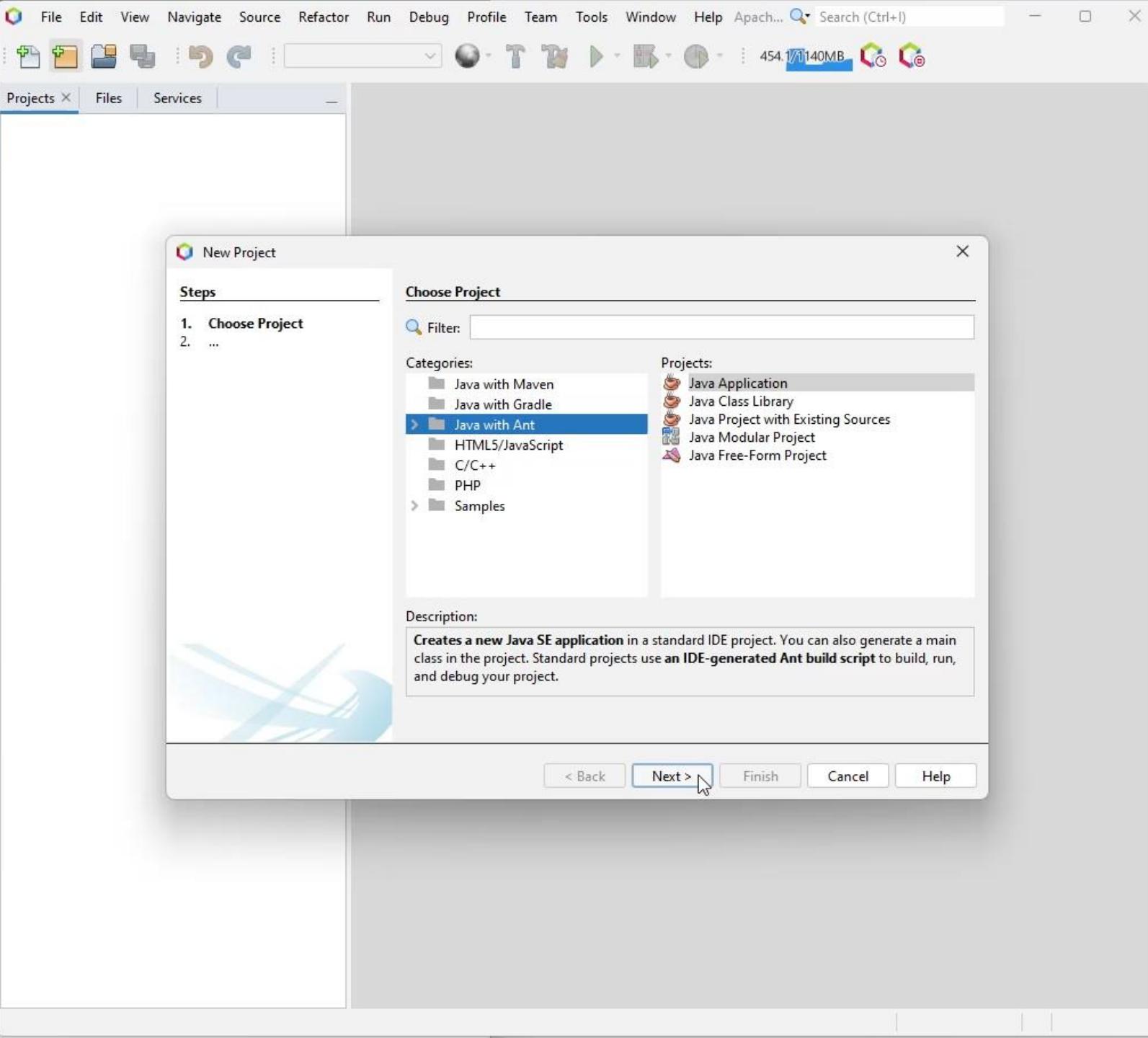
The code uses template strings and includes references to 'nbhost' and 'org.openide.'.

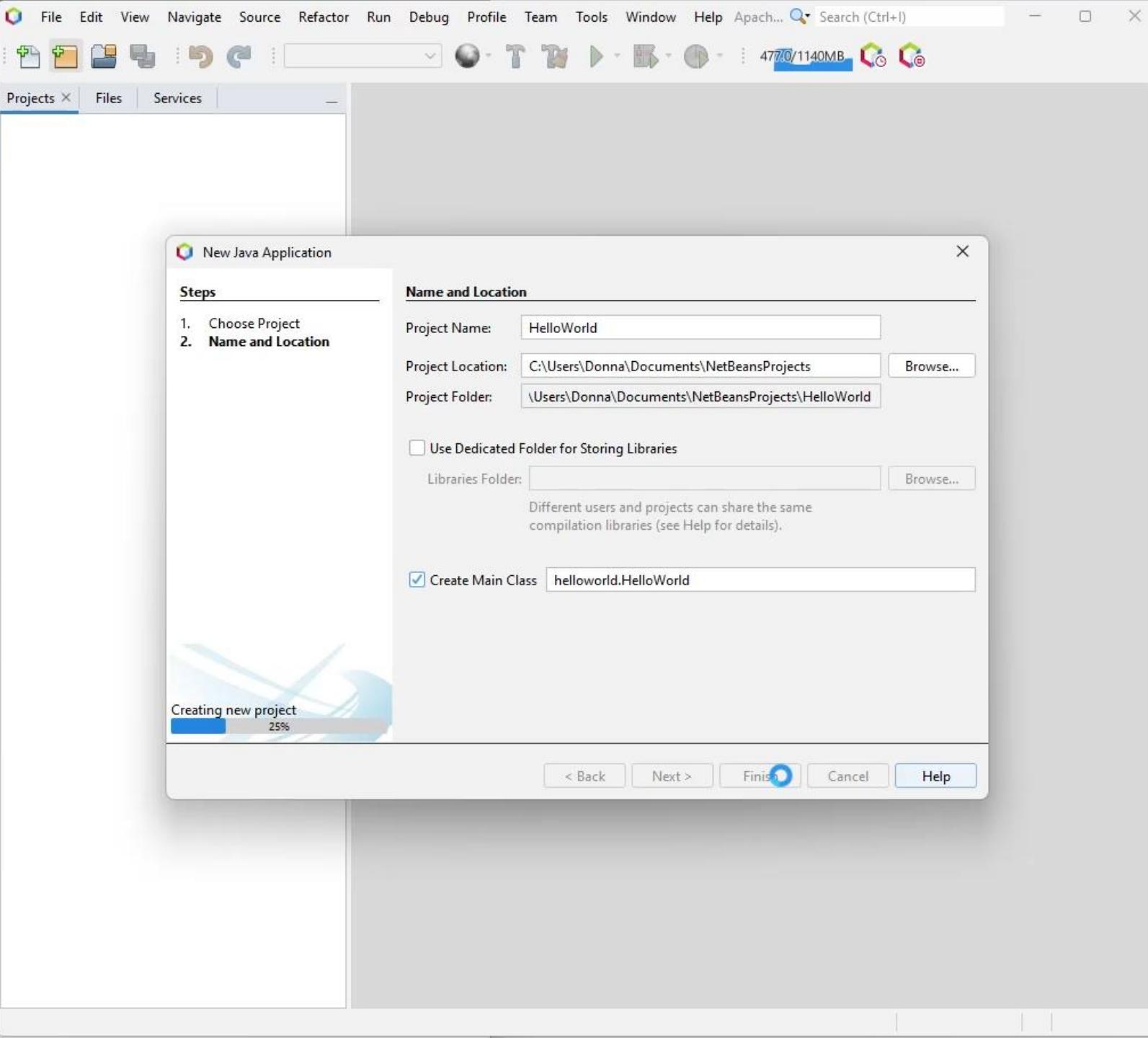
The screenshot shows a software interface, likely an Integrated Development Environment (IDE), with a menu bar at the top. The menu items include File, Edit, View, Navigate, Source, Refactor, Run, Debug, Profile, Team, Tools, Window, Help, Apache..., and Search (Ctrl+I). Below the menu is a toolbar with various icons. The main window has tabs for Projects, Files, and Services, with 'Files' currently selected. A code editor window titled 'Default License' is open, showing the following text:

```
1 ${licenseFirst!""}
2 ${licensePrefix}Donna French 1000074079
3 ${licenseLast!""}
4
```

The code editor has a Source tab and a History tab. At the bottom right of the code editor, there are status indicators showing '3:1' and 'INS'.







The screenshot shows an IDE interface with the following details:

- File Menu:** File, Edit, View, Navigate, Source, Refactor, Run, Debug, Profile, Team, Tools, Window, Help, Hello..., Search (Ctrl+I).
- Toolbar:** Includes icons for file operations like New, Open, Save, and a search icon.
- Project Explorer:** Shows a project named "HelloWorld" with a "Source Packages" folder containing a "helloworld" package and a "HelloWorld.java" file.
- Code Editor:** The "HelloWorld.java" file is open, displaying the following Java code:

```
1  /*
2  *  * Donna French 1000074079
3  */
4  package helloworld;
5
6  /**
7  *
8  * @author Donna
9  */
10 public class HelloWorld
11 {
12
13     /**
14      * @param args the command line arguments
15     */
16    public static void main(String[] args)
17    {
18        // TODO code application logic here
19    }
20
21 }
22
```
- Navigator View:** Shows the members of the "HelloWorld" class: "HelloWorld", "HelloWorld()", and "main(String[] args)".
- Status Bar:** Background scanning of projects... and INS Windows (CRLF).

```
/*
 * Donna French 1000074079
 */
package helloworld;

/**
 *
 * @author frenc
 */
public class HelloWorld
{
    /**
     * @param args the command line arguments
     */
    public static void main(String[] args)
    {
        // TODO code application logic here
    }
}
```

You will not see this code left in my slides – takes up too much space.

Used by JavaDoc to autogenerated documentation – take it out or leave it in.

The screenshot shows an IDE interface with the following components:

- Top Bar:** File, Edit, View, Navigate, Source, Refactor, Run, Debug, Profile, Team, Tools, Window, Help, Hello..., Search (Ctrl+I).
- Toolbar:** Includes icons for file operations like New, Open, Save, and a search bar labeled <default config>.
- Projects View:** Shows a project named "HelloWorld" with a "Source Packages" folder containing a "helloworld" package, which in turn contains a "HelloWorld.java" file.
- Navigator View:** Shows the "HelloWorld.java - Navigator" view with the "Members" tab selected, displaying the class "HelloWorld" and its methods "HelloWorld()" and "main(String[] args)".
- Main Editor:** The "HelloWorld.java" editor window displays the following Java code:

```
1  /*
2  * Donna French 1000074079
3  */
4  package helloworld;
5
6  public class HelloWorld
7  {
8      public static void main(String[] args)
9      {
10         // TODO code application logic here
11     }
12 }
13
14
```
- Annotations:** A large blue arrow points from the text "Comments can also start with // " to the multi-line comment block in the code. A callout bubble contains the text "Comments start with /\* and end with \*/".
- Text Box:** A callout bubble contains the text "Comments can also start with // ".
- Text Box:** A callout bubble contains the text "Each line to be commented must have its own // ".
- Text Box:** A callout bubble contains the text "// This is a single line comment".
- Status Bar:** Shows the memory usage as 831.1/1140MB and the current line as 14:1.

File Edit View Navigate Source Refactor Run Debug Profile Team Tools Window Help Hello... Search (Ctrl+I)

Projects Files Services

HelloWorld

Source Packages

helloworld

HelloWorld.java

Libraries

HelloWorld.java

Source History

/\* \* Donna French 1000074079 \*/ package helloworld; public class HelloWorld { public static void main(String[] args) { // TODO code application logic here } }

HelloWorld.java - Navigator

Members

HelloWorld

HelloWorld()

main(String[] args)

831.1/1140MB

14:1 INS

Part of the skeleton created by NetBeans

Leave this as-is

Leave off when hand writing code

The screenshot shows an IDE interface with the following components:

- Top Bar:** File, Edit, View, Navigate, Source, Refactor, Run, Debug, Profile, Team, Tools, Window, Help, Hello..., Search (Ctrl+I).
- Toolbar:** Includes icons for file operations like New, Open, Save, and Build.
- Project Explorer:** Shows a project named "HelloWorld" with a "Source Packages" folder containing "helloworld" and "HelloWorld.java".
- Code Editor:** The active tab is "HelloWorld.java". The code is:

```
1  /*
2  *  Donn French 1000074079
3  */
4  package helloworld;
5
6  public class HelloWorld
7  {
8      public static void main(s
9      {
10         // TODO code application logic here
11     }
12 }
13
14 }
```

A red arrow points from the text "This declares a class named HelloWorld." to the word "HelloWorld" in the code.
- Navigator:** Shows the members of the "HelloWorld" class: "HelloWorld" and "main(String[] args)".
- Status Bar:** Shows the time as 14:1 and mode as INS.

**This declares a class named HelloWorld.**

**Every Java program consists of one or more classes.**

**Classes are the fundamental building blocks of Java.**

**Every source file can contain at most one public class and the name of the public class must match the name of the file containing the class.**

The screenshot shows an IDE interface with the following components:

- Top Bar:** File, Edit, View, Navigate, Source, Refactor, Run, Debug, Profile, Team, Tools, Window, Help, Hello..., Search (Ctrl+I).
- Toolbar:** Includes icons for New, Open, Save, Cut, Copy, Paste, Find, Replace, and others.
- Project Explorer:** Shows a project named "HelloWorld" with a "Source Packages" folder containing "helloworld" and "HelloWorld.java".
- Code Editor:** The "HelloWorld.java" file is open, showing the following code:

```
1  /*
2  * Donna French 1000074079
3  */
4  package helloworld;
5
6  public class HelloWorld
7  {
8      public static void main(String[] args)
9      {
10         // TODO code application logic here
11     }
12 }
13
14 }
```
- Navigator:** Shows the members of the "HelloWorld" class: "HelloWorld", "HelloWorld()", and "main(String[] args)".
- Status Bar:** Displays memory usage (831.1/1140MB) and other status information.

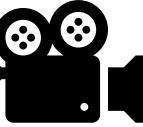
A large callout box on the right side of the code editor contains the following text:

Every Java application contains a class with a main method. When the application starts, the instructions in the main method are executed.

A second callout box at the bottom left contains the following text:

A method contains a collection of programming instructions that describe how to carry out a particular task.

Every Java application must have a main method.



File Edit View Navigate Source Refactor Run Debug Profile Team Tools Window Help Hello... Search (Ctrl+I) — □ ×

Proj... x Files Services | **HelloWorld.java x**

Source History | 780.5/1140MB

1 **/\***  
2   **\* Donna French 1000074079**  
3   **\*/**  
4   **package helloworld;**  
5  
6   **public class HelloWorld**  
7   {  
8       **public static void main(String[] args)**  
9       {  
10          **// TODO code application logic here**   
11       }  
12   }  
13  
14

main - Navigator x

Members <e...

>HelloWorld  
  HelloWorld()  
  main(String[] args)

helloworld.HelloWorld > main >

10:44 INS Windows (CRLF)

# Methods

```
System.out.println("Hello World");
```

## Method

System.out.println

## Argument

"Hello World"

Arguments are enclosed in ()

Multiple arguments are separated by commas

"Hello World"

A sequence of characters enclosed in quotation marks is called a **string**. The method will print to the screen whatever is enclosed in the quotes.

# Errors

Compile-time errors (also known as syntax errors)

- Something is wrong according to the rules of the language and the compiler detects it.

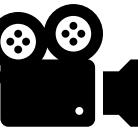
Missing a semicolon is an example of a syntax error

This statement

```
System.out.println("Hello World")
```

will produce this syntax error

```
error: ';' expected
      System.out.println("Hello World")
1 error
BUILD FAILED (total time: 1 second)
```



Type here to search



# Errors

## BEWARE

If the compiler finds an error, it will not simply stop and give up. It will try to report as many errors as it can find.

My advice is to always go back to the first error and correct it and compile again.

# Errors

## Run-time errors

The program compiles but gives the wrong output.

```
System.out.println("Hello Word");
```

Syntactically correct but gives the wrong output if you intended to output "Hello World".

These types of errors are also called **logic errors**.

# Errors

## Exceptions

Severe run time errors produced by the JVM (Java Virtual Machine).

Dividing by zero will cause an exception run time error.

Program will run up to the point of the exception and will then crash.



Projects    HelloWorld1325.java    X

Source History

Files Services

```
1  /*  
2   * Donna French 1000074079  
3   */  
4  package helloworld1325;  
5  
6  public class HelloWorld1325  
7  {  
8      public static void main(String[] args)  
9      {  
10          System.out.println("Hello World");  
11      }  
12  }  
13
```

Output - HelloWorld1325 (run) X

4:23 | INS

# Java

- Java is an object oriented language
  - Lots of other OOP languages
    - Java, C++, C#, Python, PHP, JavaScript, Ruby, Perl, Object Pascal, Objective-C, Dart, Swift, Scala, Common Lisp, MATLAB, and Smalltalk.
- Object-oriented programming (OOP) is a programming paradigm\* based on the concept of "objects", which can contain data, in the form of fields (often known as attributes or properties), and code, in the form of procedures (often known as methods).

\*paradigm - a typical example or pattern of something; a model.

# Java vs C

Java will not allow some "things" that C does

- overflow works differently
- going out of bounds in an array
- not initializing variables
- truncation of values

Apache NetBeans IDE 12.0

File Edit View Navigate Source Refactor Run Debug Profile Team Tools Window Help

Search (Ctrl+I)



Projects

Files

Services

246.0/104.0MB

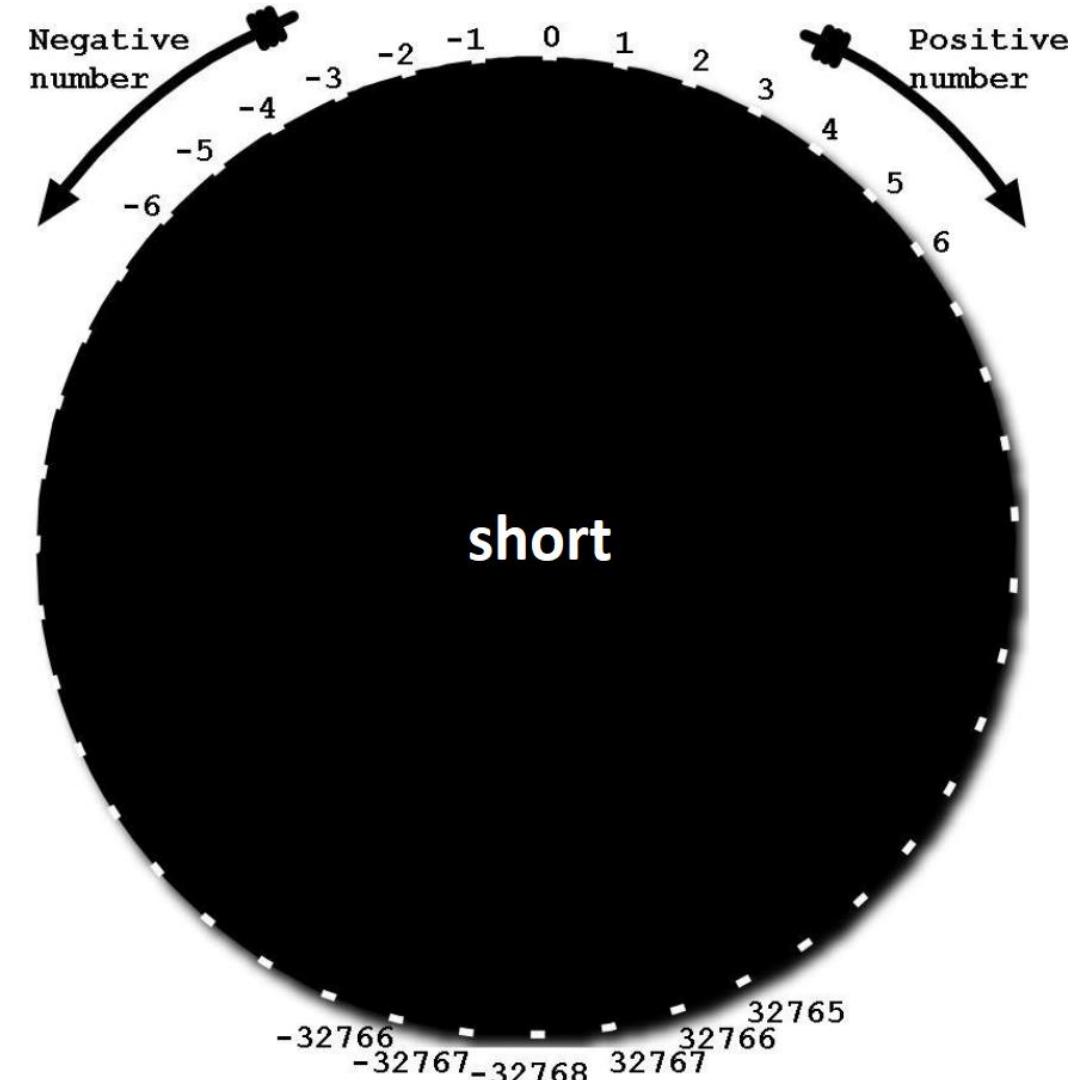


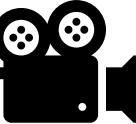
# Number Types

When an arithmetic operation attempts to create a numeric value that is outside of the range that can be represented with a given number of bits, we get

overflow

Each type has its own range





## ArrayOutOfBounds - Apache NetBeans IDE 12.0

File Edit View Navigate Source Refactor Run Debug Profile Team Tools Window Help

Search (Ctrl+I)



Projects Files Services

ArrayOutOfBoundsException.java x

Source History

```
8     public static void PrintArray(int x[])
9     {
10        for (int i = 0; i < 10; i++)
11        {
12            System.out.print(x[i]);
13        }
14        System.out.println();
15    }
16
17    public static void main(String[] args)
18    {
19        int x[] = {0,1,2,3,4,5,6,7,8,9};
20        PrintArray(x);
21        x[1] = 999;
22        PrintArray(x);
```

Output - ArrayOutOfBoundsException (run) x



21:12

INS

# Using floating point numbers with computers

- Roundoff errors are a fact of life when calculating floating point numbers.
- $1 \div 3$  is  $0.\overline{3}$  but  $0.\overline{3} * 3$  is not  $1.00$ .
- Numbers are represented using binary in computer hardware. Since only 1 and 0 are used to represent every number, some rounding errors are unavoidable.
- There is not a way to exactly represent some fractions in a computer.



Overflow.java

Source History

```
1  /*
2   *      * Donna French 1000074079
3   *      */
4  package overflow;
5
6  public class Overflow
7  {
8      public static void main(String[] args)
9      {
10
11
12 }
13 }
```

Output - Overflow (run)

```
deps-jar:
Updating property file: C:\Users\frenc\Documents\NetBeansProjects\Overflow\build\built-jar.properties
Compiling 1 source file to C:\Users\frenc\Documents\NetBeansProjects\Overflow\build\classes
compile:
run:
-2147483648
BUILD SUCCESSFUL (total time: 0 seconds)
```

259.7/485.0MB

10:9 INS

## Range of numeric data types in Java

Type	Size	Range
byte	8 bits	-128 .. 127
short	16 bits	-32,768 .. 32,767
int	32 bits	-2,147,483,648 .. 2,147,483,647
long	64 bits	-9,223,372,036,854,775,808 .. 9,223,372,036,854,775,807
float	32 bits	$3.40282347 \times 10^{38}$ , $1.40239846 \times 10^{-45}$
double	64 bits	$1.7976931348623157 \times 10^{308}$ , $4.9406564584124654 \times 10^{-324}$

# Variable Names

- Can consist of letters, digits and underscores
- Must start with a letter or underscore.
- Java is case sensitive.
- Must not be identical to a keyword
- Length is limited – varies between compilers

# Reserved Words

abstract	assert	boolean	break	byte
case	catch	char	class	const
continue	default	do	double	else
enum	extends	final	finally	float
for	goto	if	implements	import
instanceof	int	interface	long	native
new	package	private	protected	public
return	short	static	strictfp	super
switch	synchronized	this	throw	throws
transient	try	void	volatile	while

# Using Undeclared or Uninitialized Variables

- You must declare a variable before using it for the first time.
- The statements in your program are compiled in order starting in main.
- When the compiler reaches a statement containing a variable, it must already know what that variable is.
- The Java compiler will also complain if you use a variable that has not been given a value.



Variables.java x

Source History

```
1  /*
2   * Donna French 1000074079
3   */
4 package variables;
5
6 public class Variables
7 {
8     public static void main(String[] args)
9     {
10    }
11 }
12 }
```

# Constants

- When a variable is defined with the reserved word **final**, its value can never change.
- Constants are commonly written using capital letters to distinguish them visually from regular variables. Use capital letters is NOT required.

```
final int DAYS_PER_YEAR = 365;  
final int DAYS_PER_LEAPYEAR = 366;
```

- It is good programming style to use named constants in your programs to explain the meaning of numeric values.
- The value of a **final** cannot be changed after it is set (which is why it is called constant)



Projects Files Services

FinalDemo1325.java

Source History

```
3  /*
4   package finaldemo1325;
5
6   public class FinalDemo1325
7   {
8       public static void main(String[] args)
9       {
10           final int CAPACITY = 45;
11           final int NUMBEROFRCLASSROOMS = 10;
12           System.out.print("The ERB can hold ");
13           System.out.print(CAPACITY*NUMBEROFRCLASSROOMS);
14           System.out.println(" students");
15
16           System.out.println("The ERB can hold 450 students");
17       }
18   }
```

Output - FinalDemo1325 (run)

17:1 INS

# Comments

- Comments are used to provide information to the human reader of your programs.
- The compiler does not process comments at all.
- Use // to comment an entire line
- Use /\*        \*/ to comment blocks of code.

# Converting Floating Point Numbers to Integer

If you try to assign a floating point number to an integer, you will get an error

```
public static void main(String[] args)
{
    double x = 1;
    int y = x;
}
```

```
Compiling 1 source file to
C:\Users\Donna\Desktop\UTA\CSE1310\Programs\Arithmetic\build\classes
C:\Users\Donna\Desktop\UTA\CSE1310\Programs\Arithmetic\src\arithmetic
\Arithmetic.java:19: error: incompatible types: possible lossy
conversion from double to int
    int y = x;
```

```
1 error
BUILD FAILED (total time: 1 second)
```

# Converting Floating Point Numbers to Integer

```
public static void main(String[] args)
{
    double x = 1;
    int y = x;
}
```

The compiler disallows this assignment because it is potentially dangerous

The fractional part is lost

The magnitude may be too large (the largest integer is about 2 billion but a floating point number can be much larger)

# Converting Floating Point Numbers to Integer

The cast operator is used to convert a floating point value to an integer.

Write the cast operator before the expression that you want to convert and enclose the cast in ()

```
public static void main(String[] args)
{
    double x = 1;
    int y = (int) x;
}
```

Common coding error

int y = int (x);

placing the () around the variable instead of the cast

This placement of the () turns the statement into a method call

Apache NetBeans IDE 12.0

File Edit View Navigate Source Refactor Run Debug Profile Team Tools Window Help

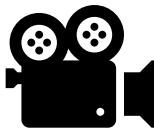
Search (Ctrl+I)



331.2 / 485.0MB



Projects  
Files  
Services



# Converting Floating Point Numbers to Integer

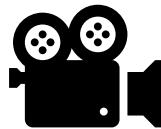
The cast operator discards the fractional part of the floating point value.

This may not be the desired outcome.

If you actually need to round the number (rather than discard), then use the math method `round`.

Please note that the method `round` follows the standard rule of rounding down from anything below 5 and rounding up for anything 5 and above.

1.4999 rounds down to 1 and 1.5 rounds up to 2



Casting1325 - Apache NetBeans IDE 12.0

File Edit View Navigate Source Refactor Run Debug Profile Team Tools Window Help

<default config> 295.7/485.0MB

Casting1325.java

Source History

```
1  /*
2   * Donna French 1000074079
3   */
4 package casting1325;
5
6 public class Casting1325
7 {
8     public static void main(String[] args)
9     {
10        double x = 1.2;
11        int y = (int)x;
12
13        System.out.println(x);
14        System.out.println(y);
15    }
}
```

Output - Casting1325 (run)

```
Updating property file: C:\Users\frenc\Documents\NetBeansProjects\Casting1325\build\built-jar.properties
Compiling 1 source file to C:\Users\frenc\Documents\NetBeansProjects\Casting1325\build\classes
compile:
run:
1.2
1
BUILD SUCCESSFUL (total time: 1 second)
```

11:22 INS

```
public static void main(String[] args)
{
    double x = 1.7;

    int y = (int) Math.round(x);

    System.out.println(x);
    System.out.println(y);
}
```