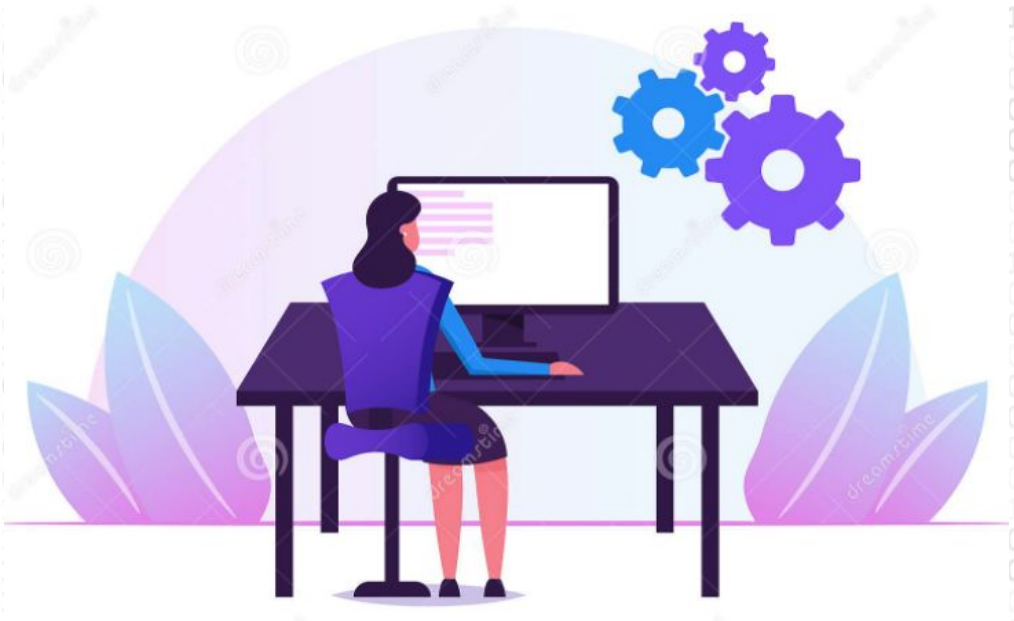
Welcome!



- We'll start in a moment :)
- We are NOT recording tonight's event. We may plan to take screenshots for social media.
- ***If you want to remain anonymous***, change your name & keep video off.
- We'll introduce the hosts & might break in-between for Q/A.
- We will make some time for Q&A at the end of the presentation as well.
- You can come prepared with questions.
- Feel free to take notes.
- Online event best practices:
    - Don't multitask. Distractions reduce your ability to remember concepts.
    - Mute yourself when you aren't talking.
    - We want the session to be interactive.
    - Feel free to unmute & ask questions.
- Turn on your video if you feel comfortable.

- *Disclaimer: Speaker doesn't knows everything!*

WWCode Digital + **Backend**

Backend Study Group

May 25, 2022

WOMEN WHO CODE

Introduction & Agenda

- Welcome from WWCode!
- Our mission: Inspiring women to excel in technology careers.
- Our vision: A world where women are representative as technical executives, founders,VCs, board members and software engineers.

Prachi Shah
Speaker,
Senior Software Engineer, Metromile
Director, WWCode SF

Harini Rajendran
Co-host,
Software Engineer, Confluent
Lead, WWCode SF

- Improve your code debugging skills.
- What is code debugging?
- Why is debugging an important skill?
- Live code debugging.
- Q/A.

Disclaimer:
- Sessions can be heavy!
- Lots of acronyms.
- Speaker doesn't know everything.

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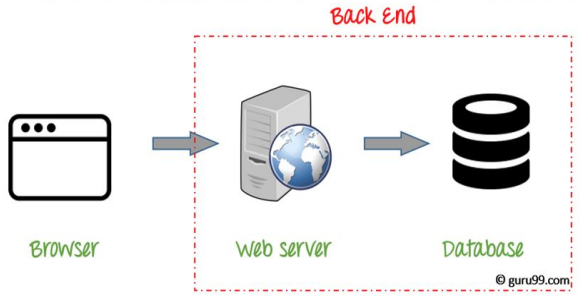
Backend Engineering

- Design, build and maintain server-side web applications.



- Common terms: Client-server architecture, networking, API, web frameworks, platform, micro-service, database engineering, web fundamentals, etc.

- Other domains: Front end engineering, full stack engineering, design & user experience, mobile development, devOps engineering, machine learning, etc. *

- Examples: Amazon Online Shopping, Instagram, Weather website.

** Disclaimer: Roles and responsibilities can vary per company and industry.*

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Code Debugging

- **Code debugging:**
  - Run the code step-by-step.
  - Understand the program flow and data flow.
  - Find problems in the code: errors and exceptions.
  - Find, fix and test for bugs.
  - Test the functionality (business logic).

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Code Debugging

- **Code debugging is an important skill:**
  - All code has bugs. For quality code, we want the application to be bug-free.
  - Bugs can introduce serious flaws in the functionality and cause serious effects. Ex.
  - Functionality (business logic) should work as designed and expected.
  - Best practices for coding support bug-free development.
  - External integration development should be bug-free and tested thoroughly.
  - Understand someone else's code.
  - Explain your code to someone else.
  - Explaining application functionalities (business logic) to others.
  - Essential skill for engineers to design, write, execute and test quality code.

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Code Debugging

- **When debugging**:
  - Observe the error messages and exceptions. Review the stack trace.

```
Exception in thread "main" java.lang.NullPointerException: Cannot
invoke "java.util.HashSet.contains(Object)" because "roots" is null at
com.wwcodesf.backendstudygroup.codedebugging.ReplaceWords.replaceWords
InSentence(ReplaceWords.java:58)
at
com.wwcodesf.backendstudygroup.codedebugging.ReplaceWords.main(Replace
Words.java:38)
```

  - Write clean code. Use best practices (can be language-specific).
  - "DRY" principle: don't repeat yourself – don't repeat the code.
  - "KISS" principle: keep it simple stupid – write simple code that is easy to read and test.
  - Ask for help: from a co-worker, the internet, books, etc. Revise or study. :)

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Code Debugging

- **How to debug code (with examples)**:
  - Print statements after running the application. Logging statements using loggers.
  - Insert *assert* statements in the functions to check for correct conditions.

```
for (int i = 1; i <= word.length(); ++i) {
        prefix = word.substring(0, i);
        if (words.contains(prefix)) {
            System.out.println(i);              // i=3
            System.out.println(word.length());  // word="cattle" and length=6
            logger.info(prefix);    // prefix="cat"
            assert i != 0;
            break;
        } }
```

```
Output:
3
6
Apr 02, 2022 1:45:27 AM com.wwcodesf.backendstudygroup.codedebugging.ReplaceWords
replaceWordsInSentence
INFO: cat
```

  - IDEs has debugger to debug through the code and view objects, data and errors.
  - Unit testing.

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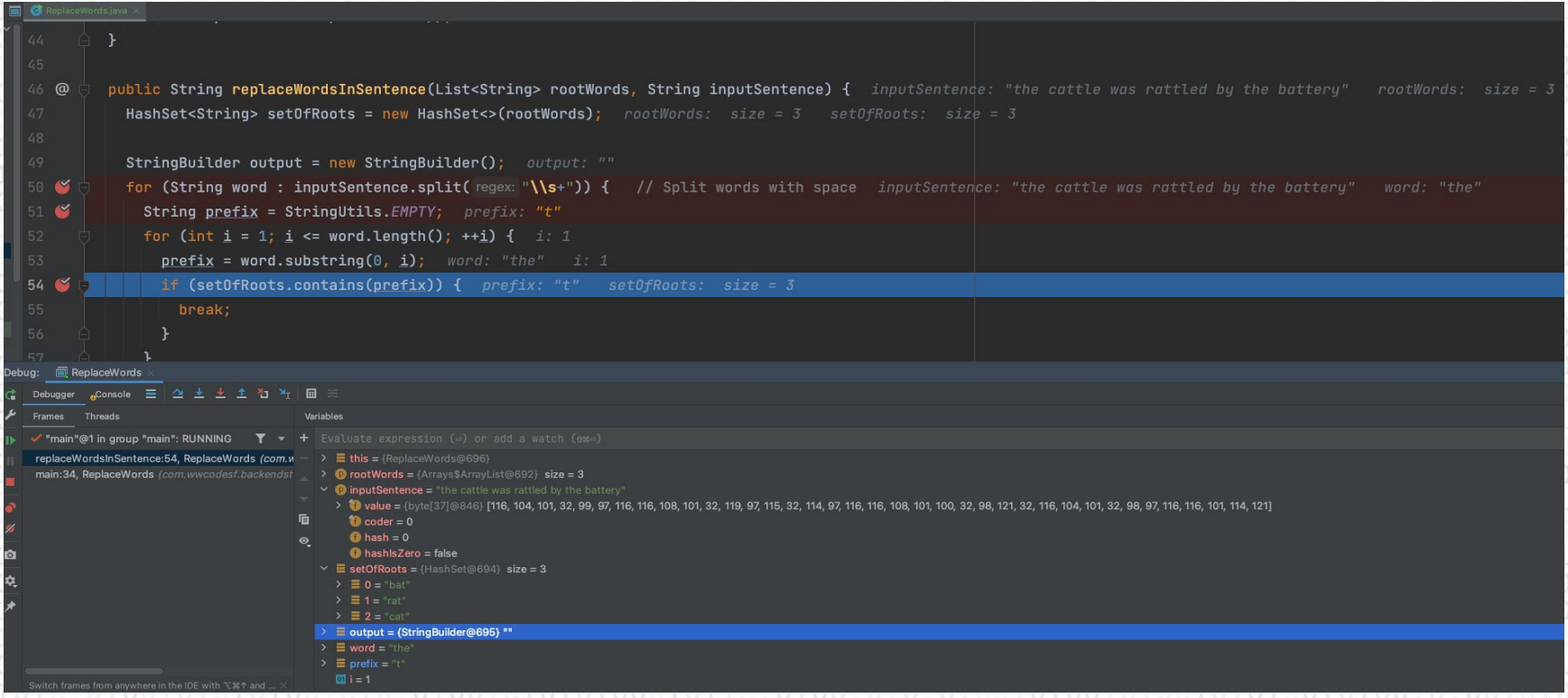
Code Debugging



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Code Debugging

- **Code debugging tools:**
  - IDE (Integrated Development Environment) provides debugging functionality.
  Example: IntelliJ IDEA, Eclipse, MS Visual Code Studio, etc.
  Add *breakpoints* to statements and the *debugger* will debug step-by-step.
  - Frontend code: TypeScript auto-detects errors and bad syntax.
  - In the browser: *console.log() or console.debug()* to debug frontend code.
  - node.js has a *debugger* that does stepping and code inspections.
  - Python has a built-in debugger called *pdb*.
  - Java has a built-in command-line debugger called *jdb*.
  - Sentry logging prints out useful debugging information about the application.
  - More: GNU Debugger *gdb*, CodeLite for C/C++, Xcode debugger for iOS, etc.

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Code Debugging

- **Debugging as an engineer at a workplace:**
  - Debugging code locally for development.
  - Debugging code locally for testing.
  - Debugging code locally for integration (external).
  - Fix production bugs.
  - Pair programming with another engineer.
  - Understand fellow engineer's code.
  - Explain your code to fellow engineers.
  - Explaining application functionalities (business logic) to others.
  - When setting up a new project, debugging & running tests is the best way to learn!

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Code Debugging

Demo

Java Code, Program Flow, Unit Tests

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Code Debugging

- **Key Takeaways:**
  - Run the code step-by-step.
  - Understand the program flow and data flow.
  - Find problems in the code: errors and exceptions.
  - Find, fix and test for bugs.
  - Test the functionality (business logic).
  - All code has bugs. For quality code, we want the application to be bug-free.
  - Write clean code. Use best practices (can be language-specific).
  - Understand existing applications, explain code functionality and write good tests.
  - IDEs,and languages have in-built debuggers & independent debugger tools.
  - Essential skill for engineers!
  - Ask for help: from a co-worker, the internet, books, etc. Revise or study. :)

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Backend Engineering

Resources:

- What is Debugging? How to Debug Your Code for Beginners
- Debugger
- Debug_code

Backend Study Group:

- Presentations on GitHub and session recordings are found on WWCode YouTube channel
- Upcoming session: June 30th, 2022 about

Transition from a Frontend Engineer to a Backend Engineer.

- Technical Tracks and Digital Events.
- Get updates – join the Digital mailing list!
- Have questions?
    - Contacts us at: contact@womenwhocode.com
    - Join our Slack workspace and join *#backend-study-group*!

You can unmute and talk or use the chat.

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