



# Object-Oriented Programming In Mechatronic Systems

Summer School 2018

**Final Project Preparations**

Aachen, Germany

Cybernetics Lab IMA & IfU  
Faculty of Mechanical Engineering  
RWTH Aachen University

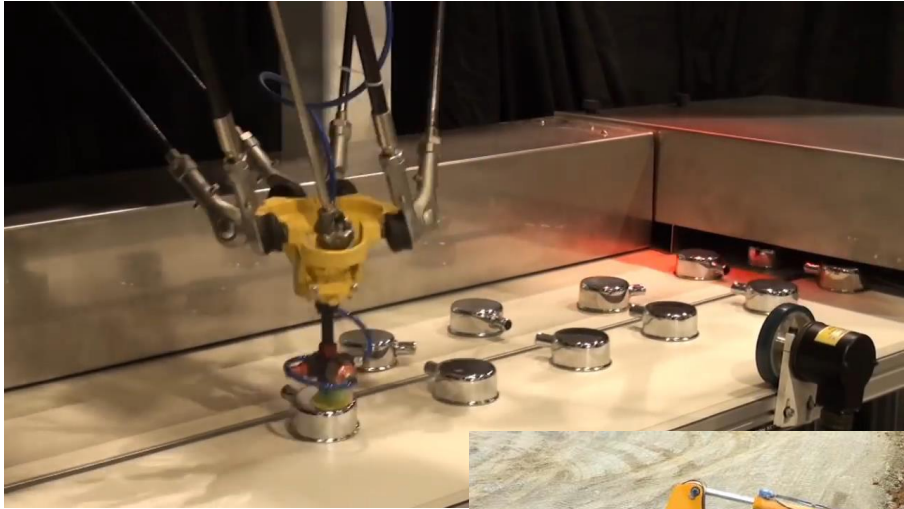


# Final Project

# Final Project: Motivation

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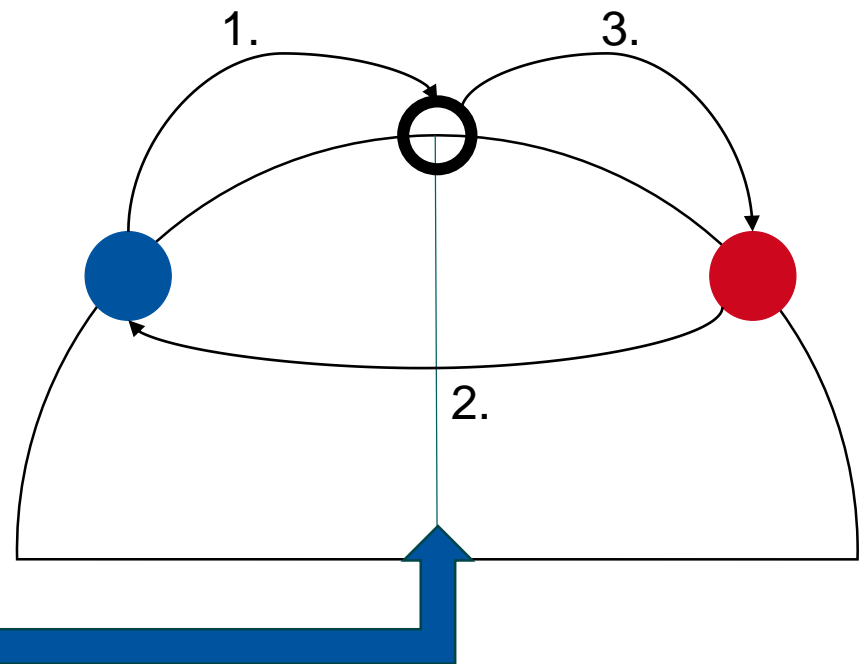
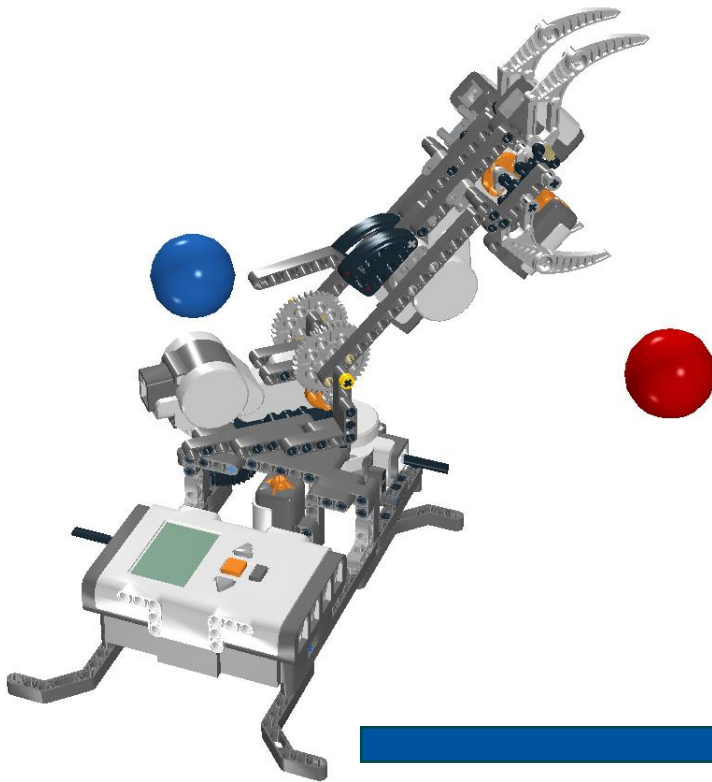
## Mechatronic systems are everywhere!



# Final Project: Robot Programming

**In the final project, you will program a real robot!**

- We use LEGO Mindstorm robots
- The task: Find and swap colored balls with the robot





# Final Project: Robot Programming

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## The robots have several elements



Touch sensor



Light sensor



Ultrasonic sensor



NXT (Brick):  
The robot's core



Ports



Buttons

# Preparing for Robot Programming

# Preparing for Robot Programming

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**After finishing the preparation, you can start with the final project!**

- Find teams to work together
- Get a LEGO Mindstorms robot pack
- Follow the instructions to install required software & prepare your Laptop

# Preparing for Robot Programming

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## Download the installation files from our website

 [https://sloumotion.github.io/opms\\_2018/](https://sloumotion.github.io/opms_2018/)

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## Final Project

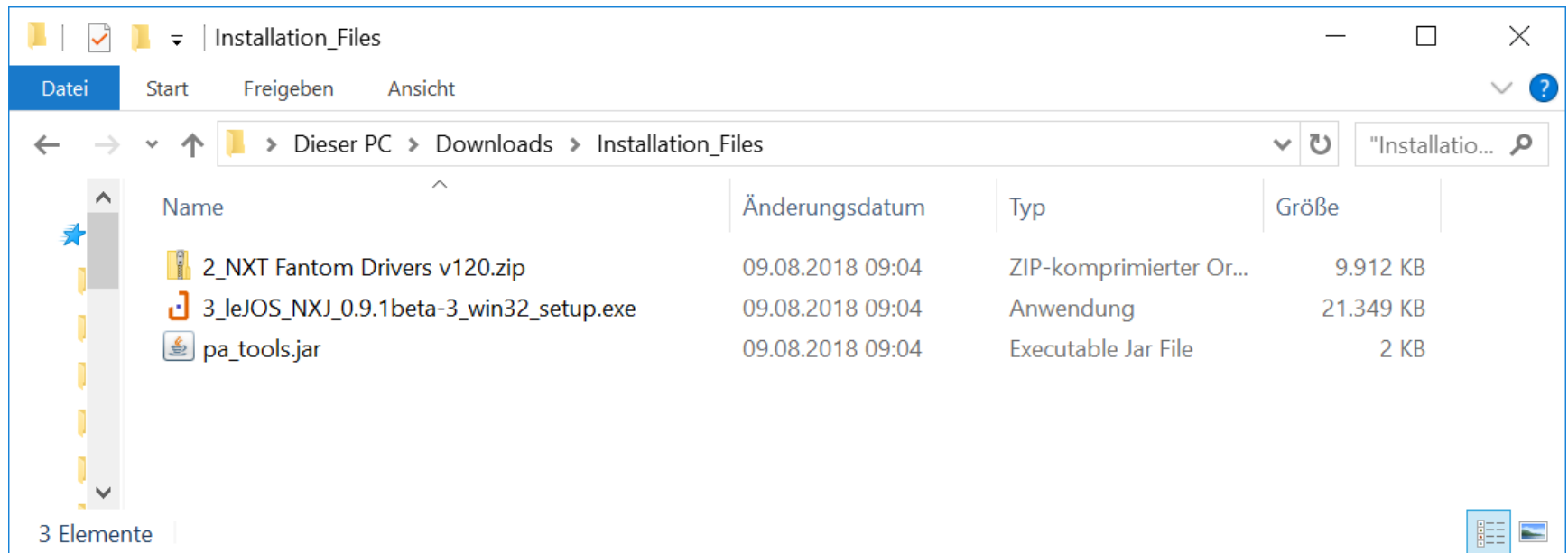
- [Setup Instructions](#)
- [Installation Files](#)
- Link to Lejos Package in Eclipse: <http://www.lejos.org/tools/eclipse/plugin/nxj/>
- [Project Template](#)



# Preparing for Robot Programming

## Download the installation files from our website

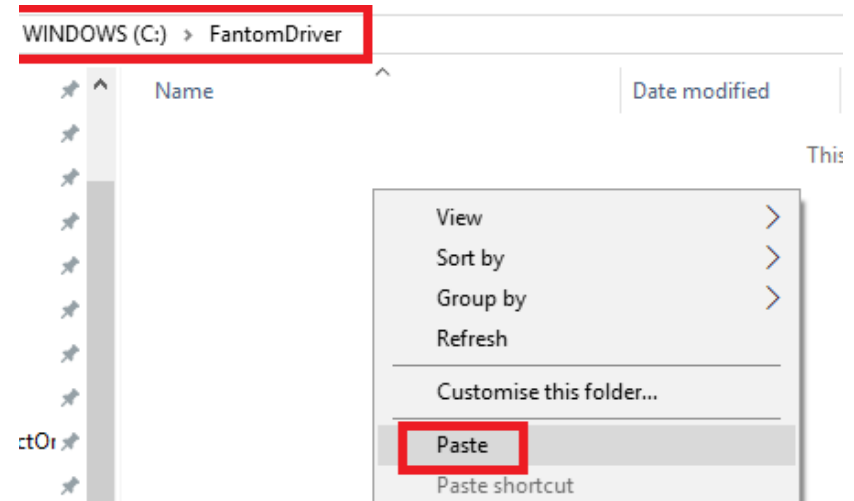
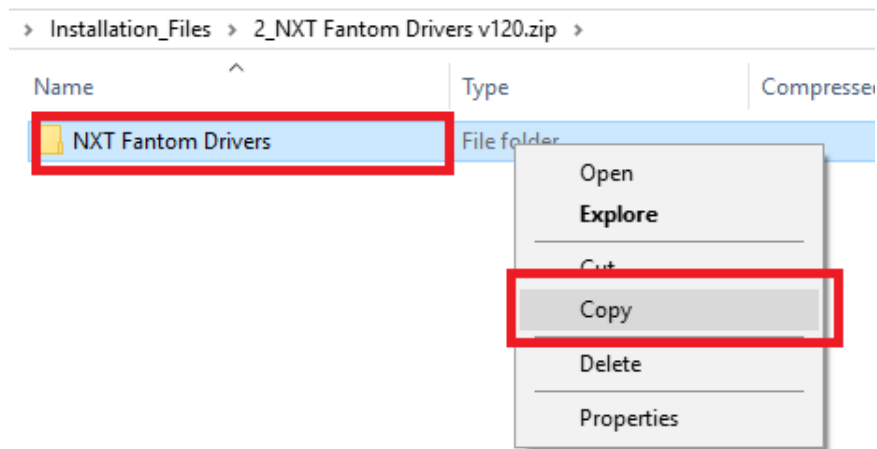
 [https://sloumotion.github.io/opms\\_2018/](https://sloumotion.github.io/opms_2018/)



# Preparing for Robot Programming

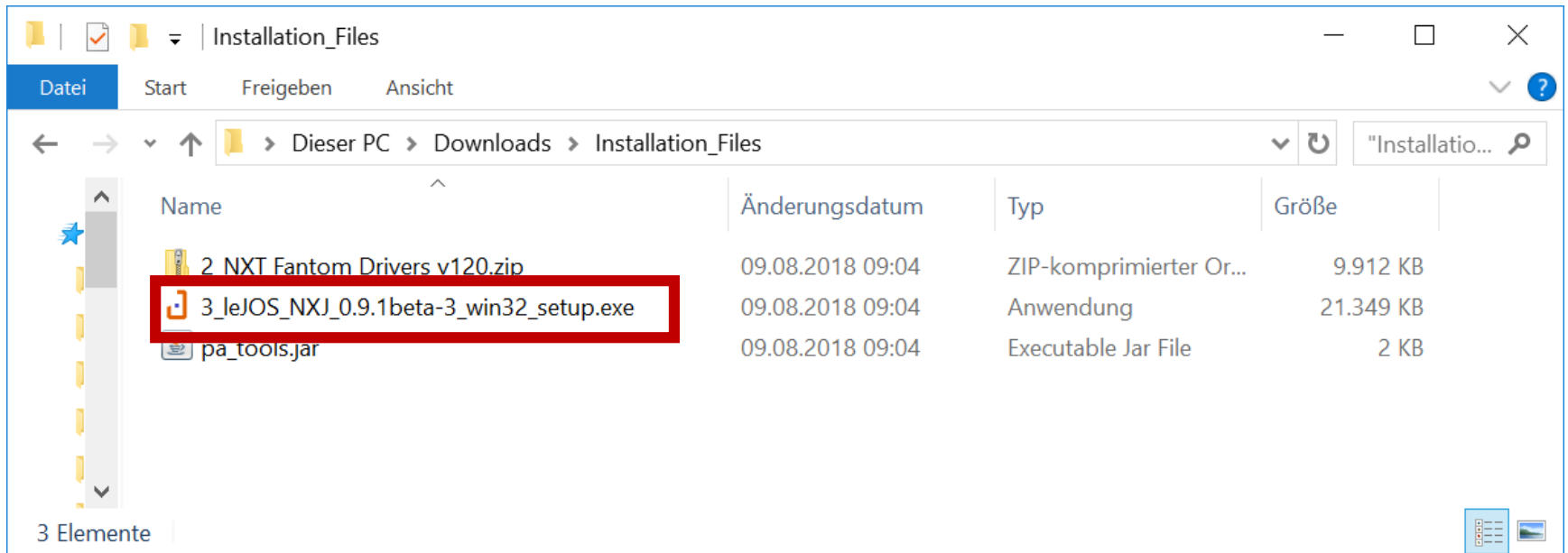
## Extract the Fantom driver

- On your laptop, create the directory C:\FantomDriver\
- Enter (double-click) 2\_NXT Fantom Drivers v120.zip
- Right-click the folder and copy it to the directory created above



# Preparing for Robot Programming

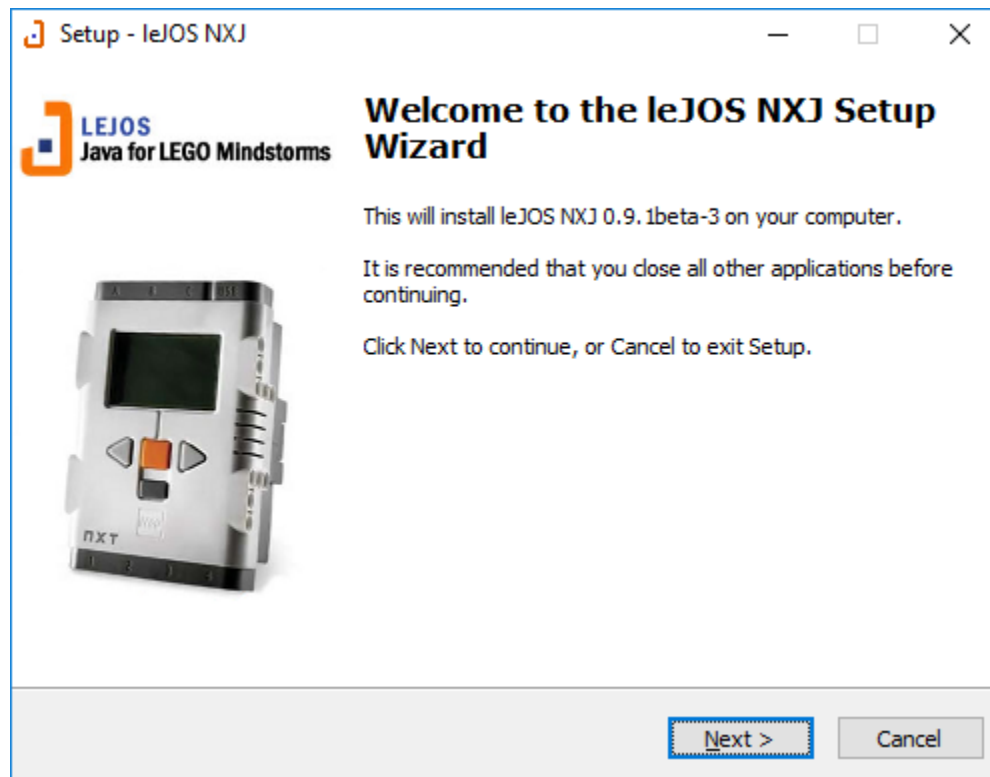
## Install leJOS



# Preparing for Robot Programming

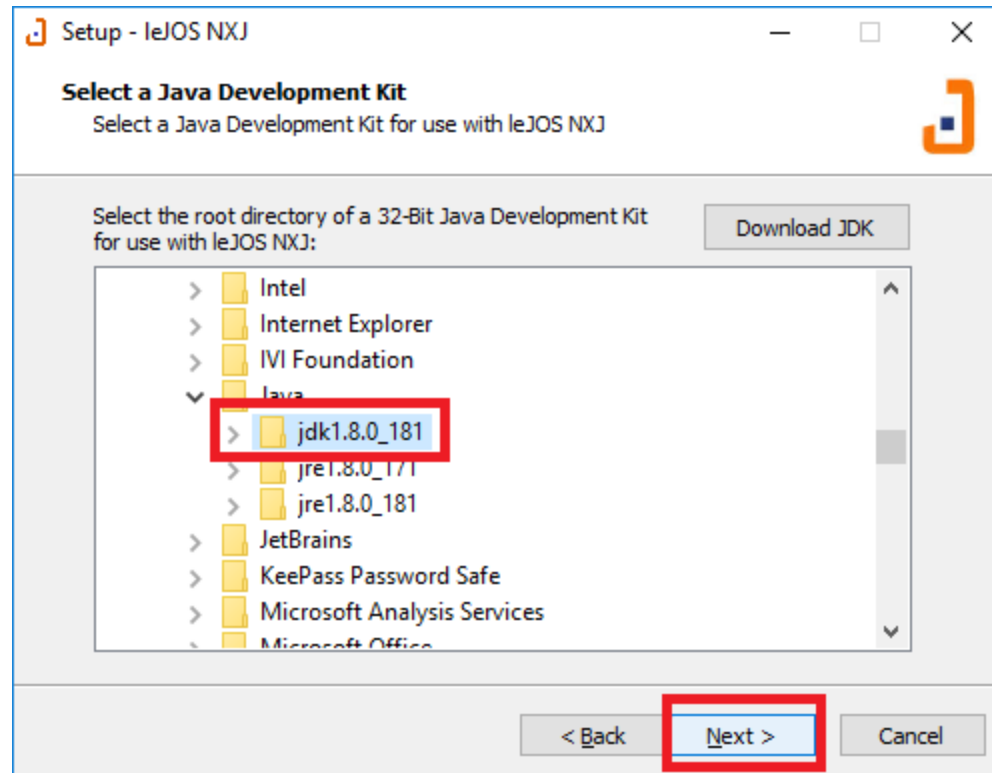
## Install leJOS

- Run 3\_leJOS\_NXJ\_0.9.1beta-3\_win32\_setup.exe



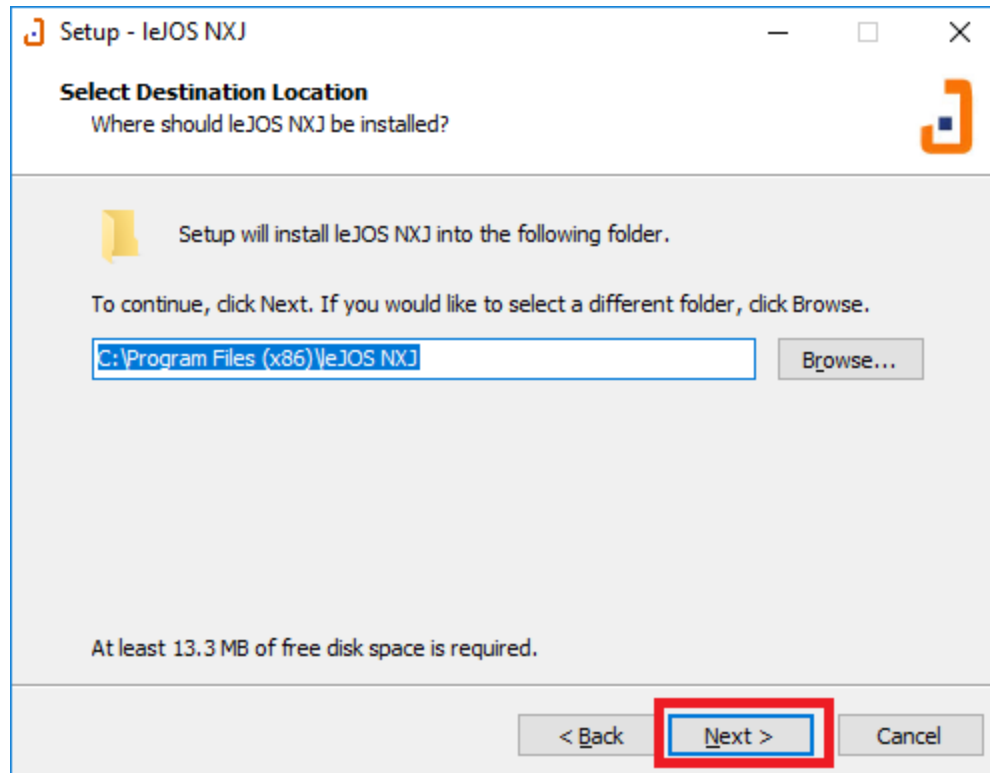
# Preparing for Robot Programming

## Install leJOS



# Preparing for Robot Programming

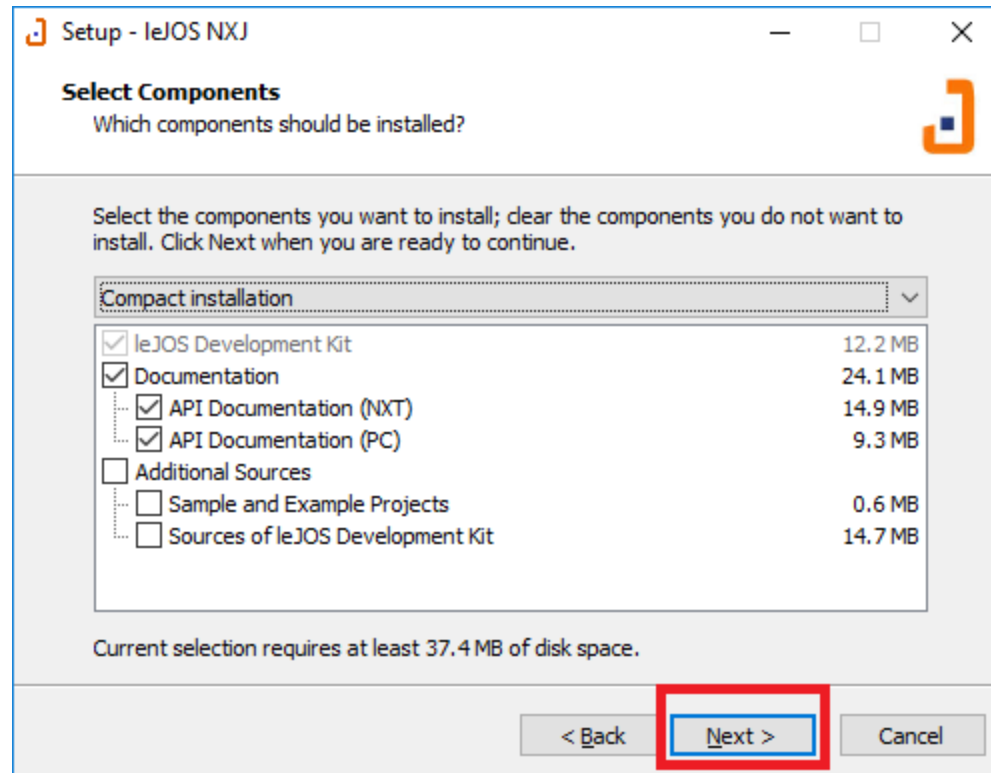
## Install leJOS





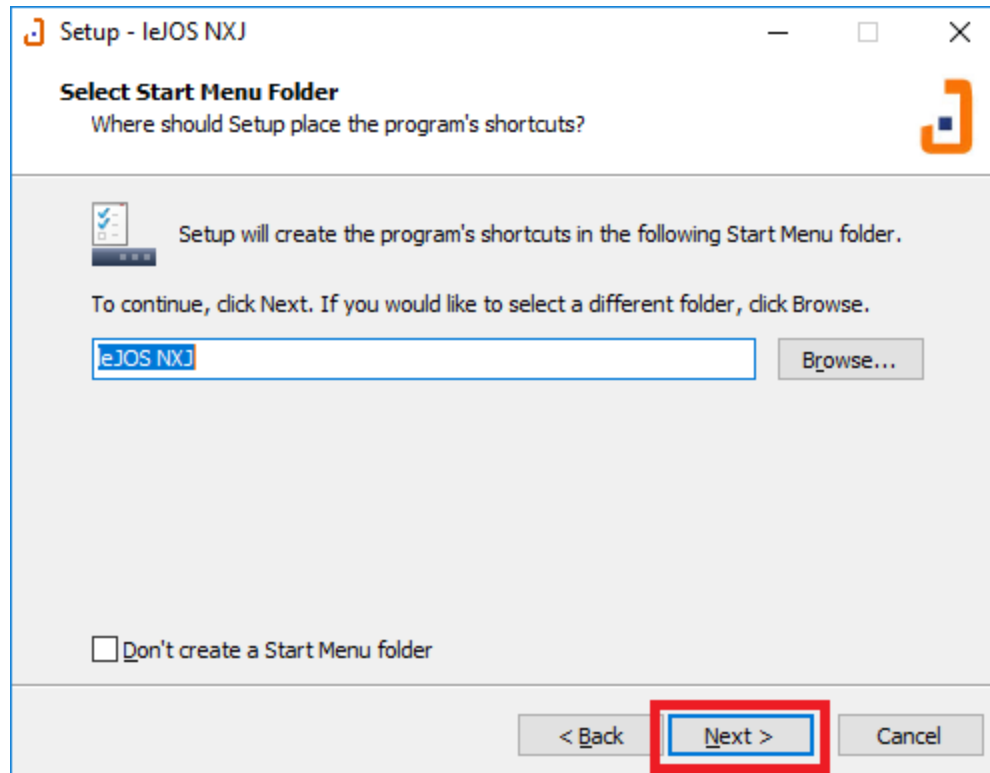
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## Install leJOS



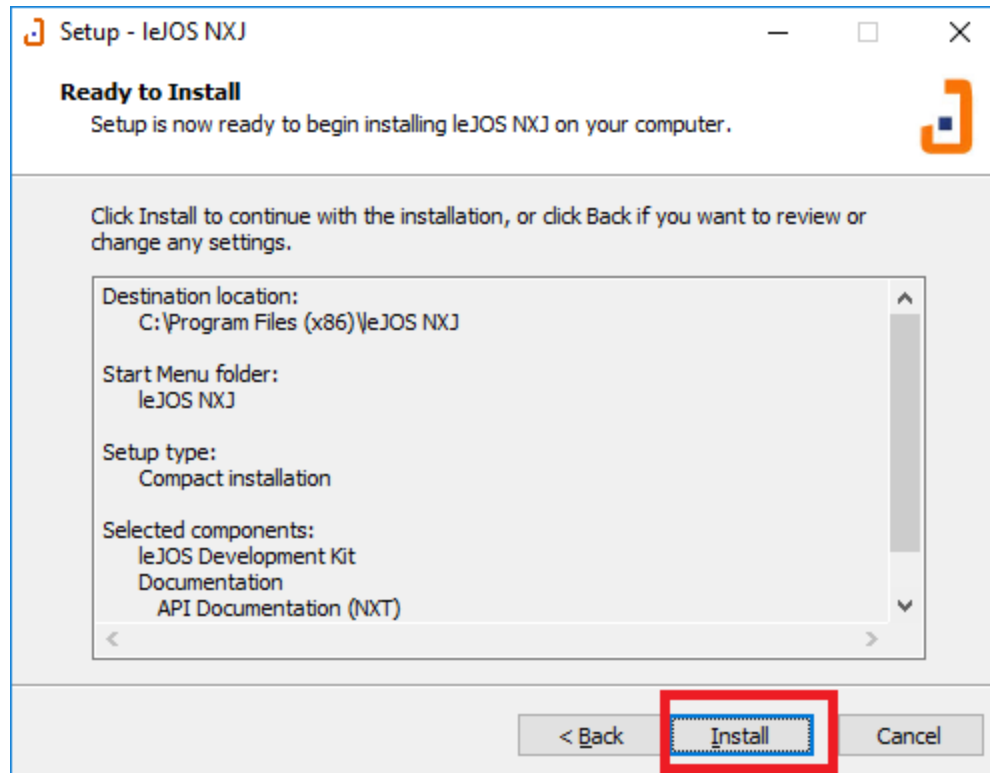
# Preparing for Robot Programming

## Install leJOS



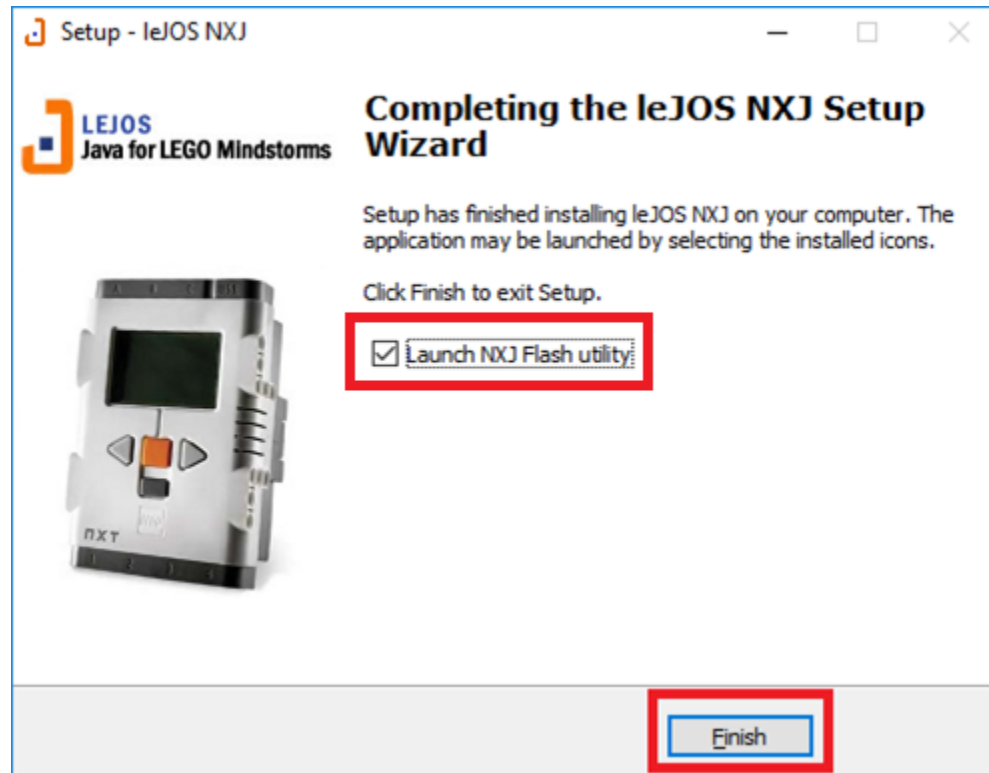
# Preparing for Robot Programming

## Install leJOS



# Preparing for Robot Programming

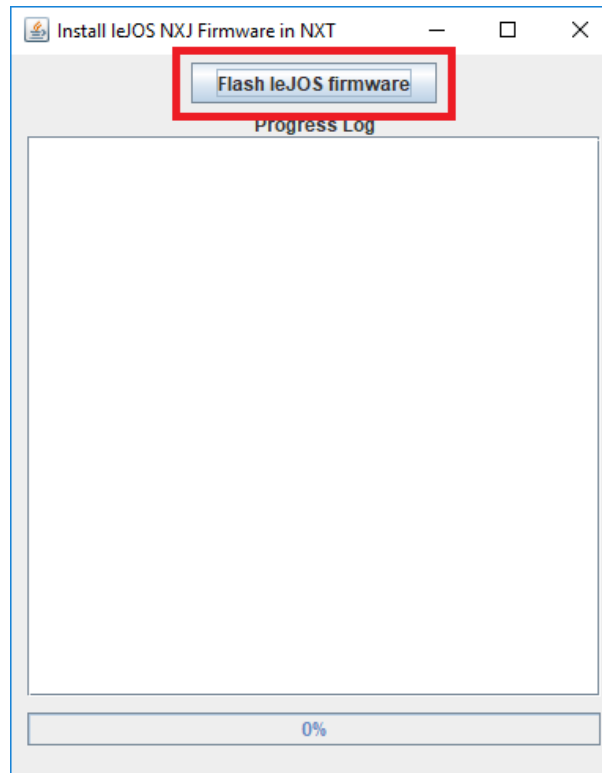
## Install leJOS



# Preparing for Robot Programming

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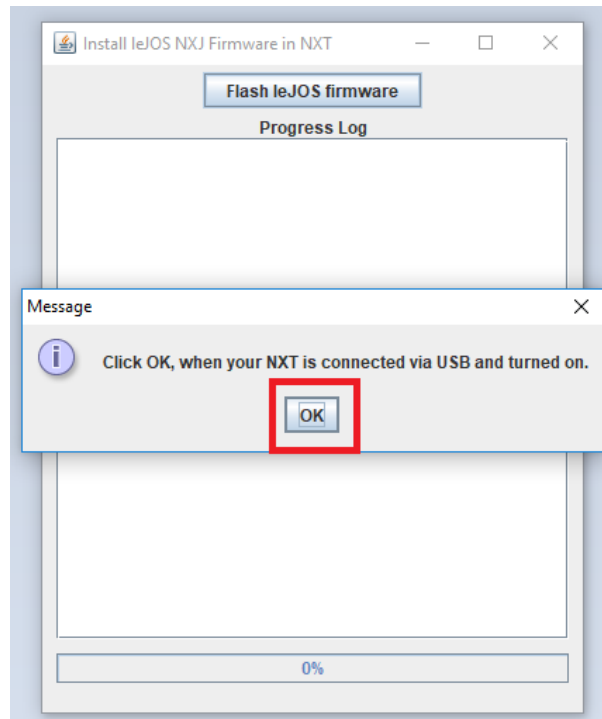
## Prepare the robot: Flash leJOS



# Preparing for Robot Programming

## Prepare the robot: Flash leJOS

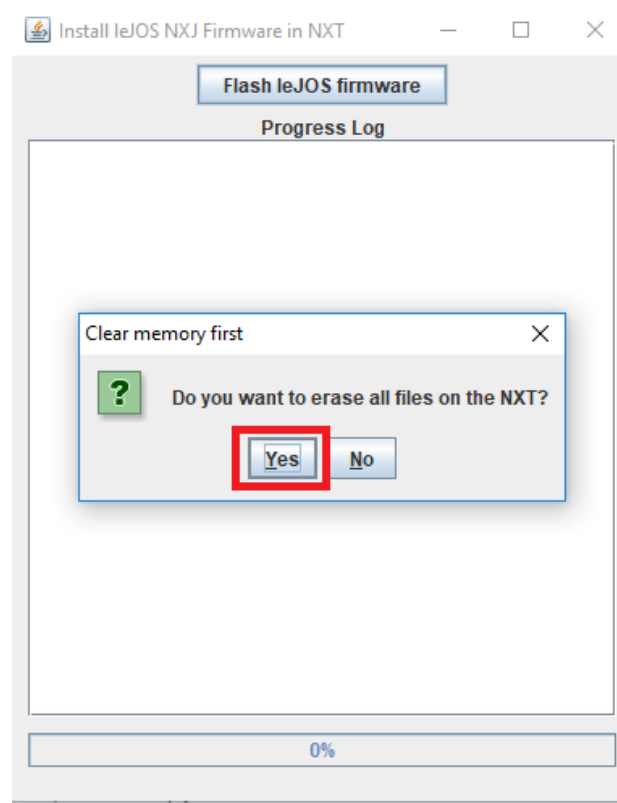
Connect the robot via  
USB & turn it on





# Preparing for Robot Programming

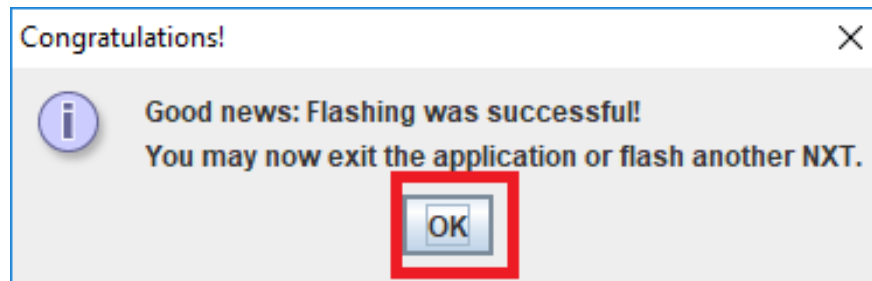
## Prepare the robot: Flash leJOS



# Preparing for Robot Programming

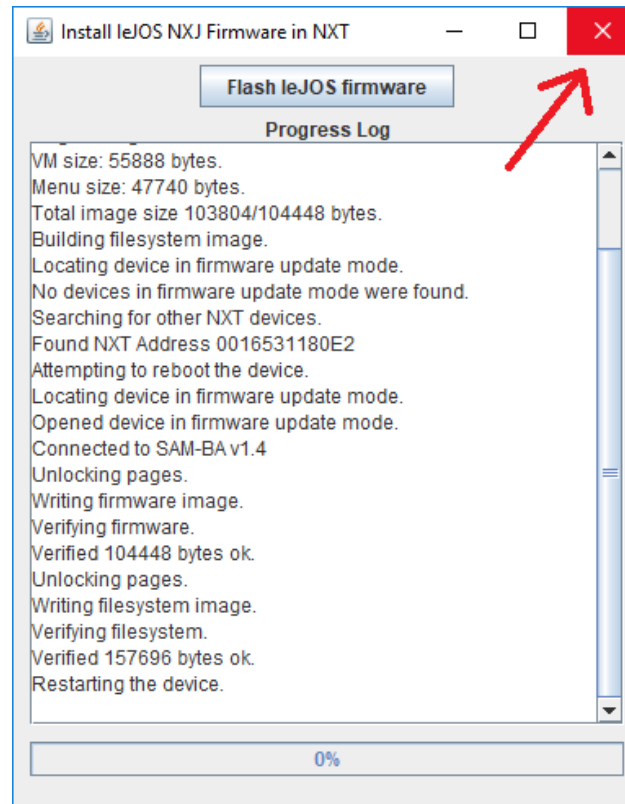
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## Prepare the robot: Flash leJOS



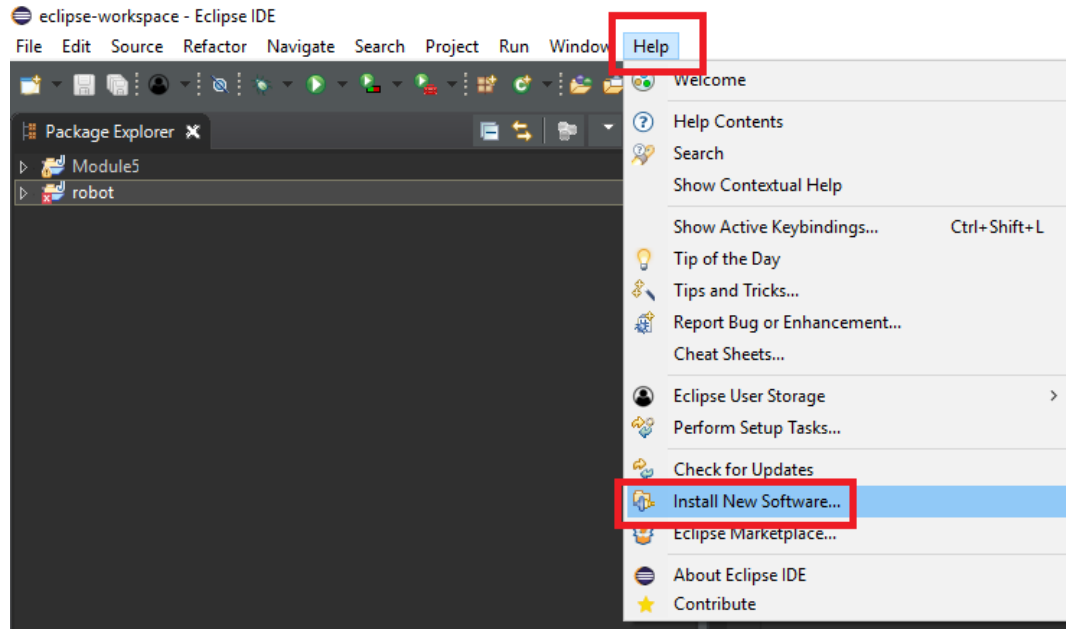
# Preparing for Robot Programming

## Prepare the robot: Flash leJOS



# Preparing for Robot Programming

## Install robot software in Eclipse



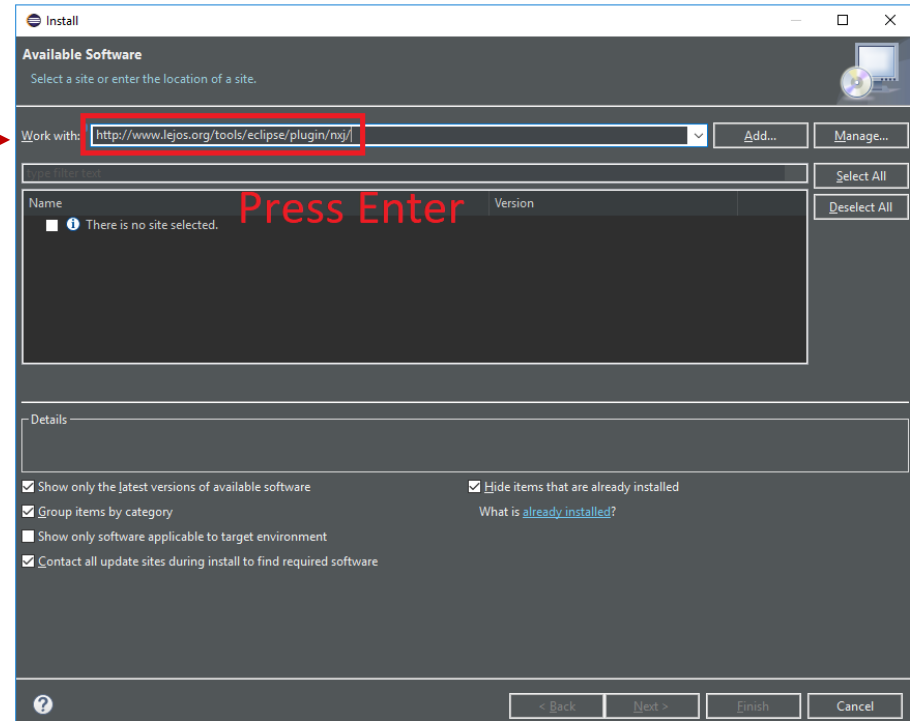
# Preparing for Robot Programming

## Install robot software in Eclipse

### Final Project

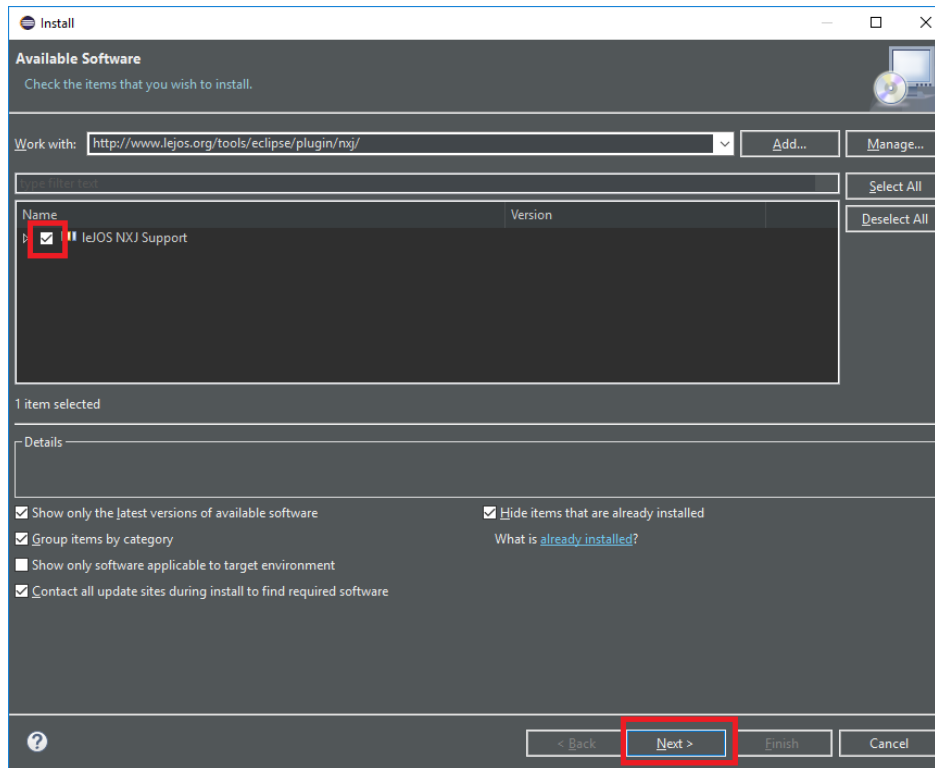
- [Setup Instructions](#)
- [Installation Files](#)
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**Copy & Paste Link from the website**



# Preparing for Robot Programming

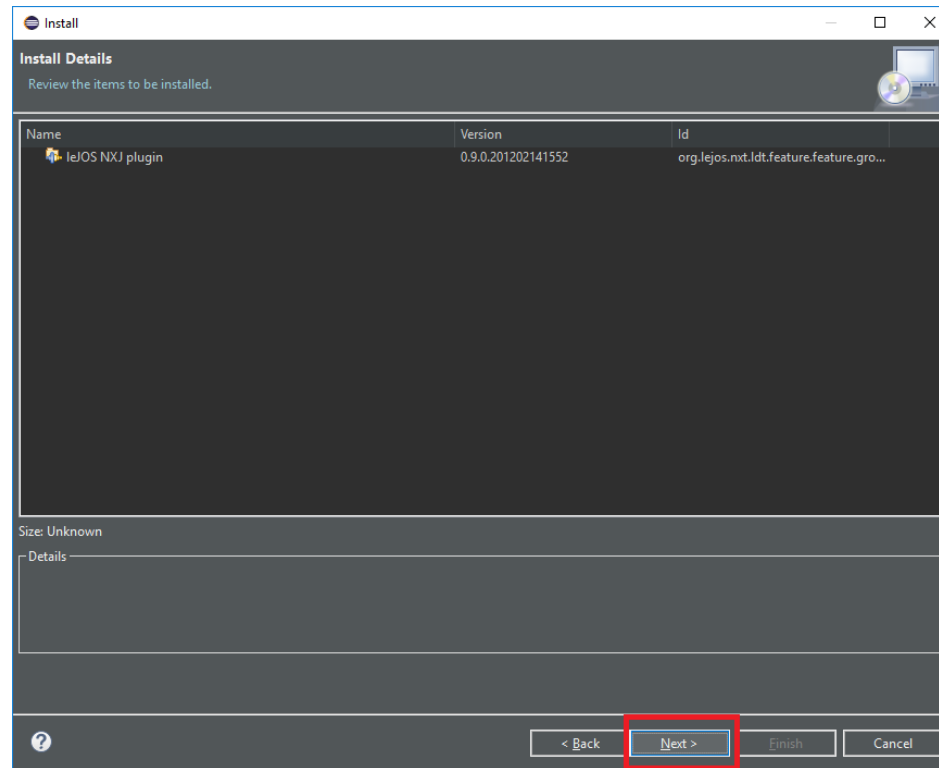
## Install robot software in Eclipse





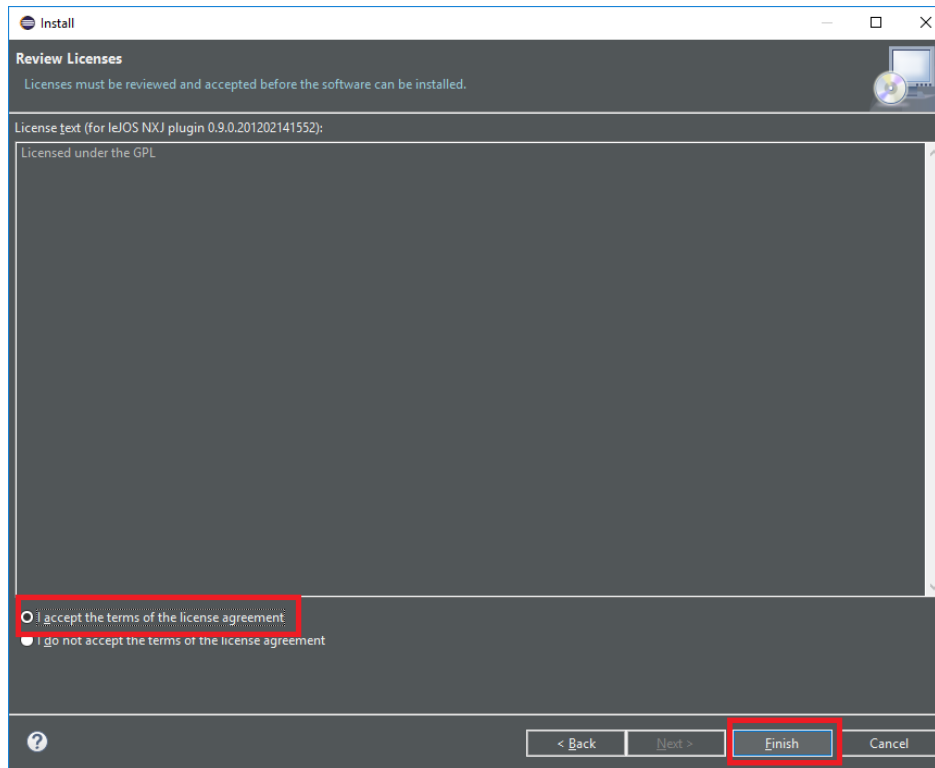
# Preparing for Robot Programming

## Install robot software in Eclipse



# Preparing for Robot Programming

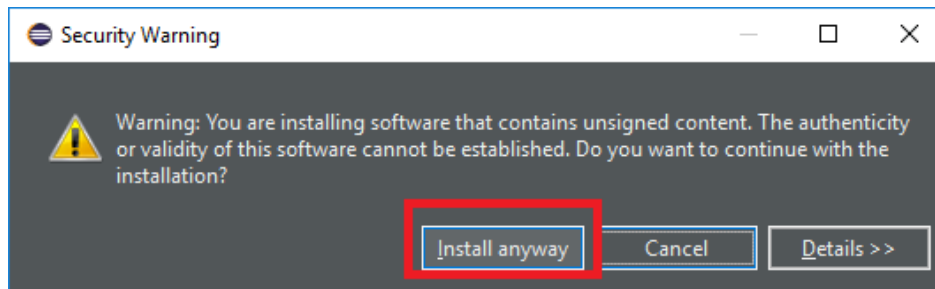
## Install robot software in Eclipse



# Preparing for Robot Programming

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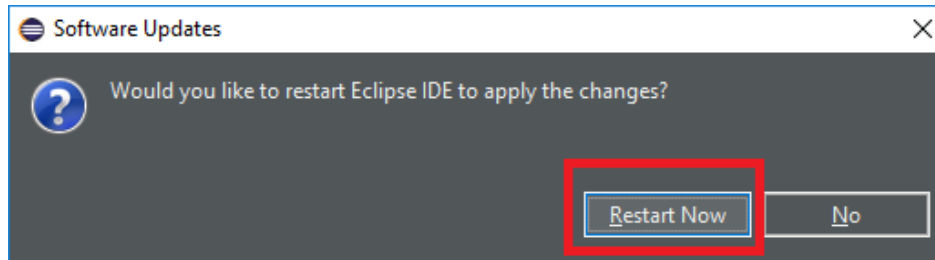
## Install robot software in Eclipse



# Preparing for Robot Programming

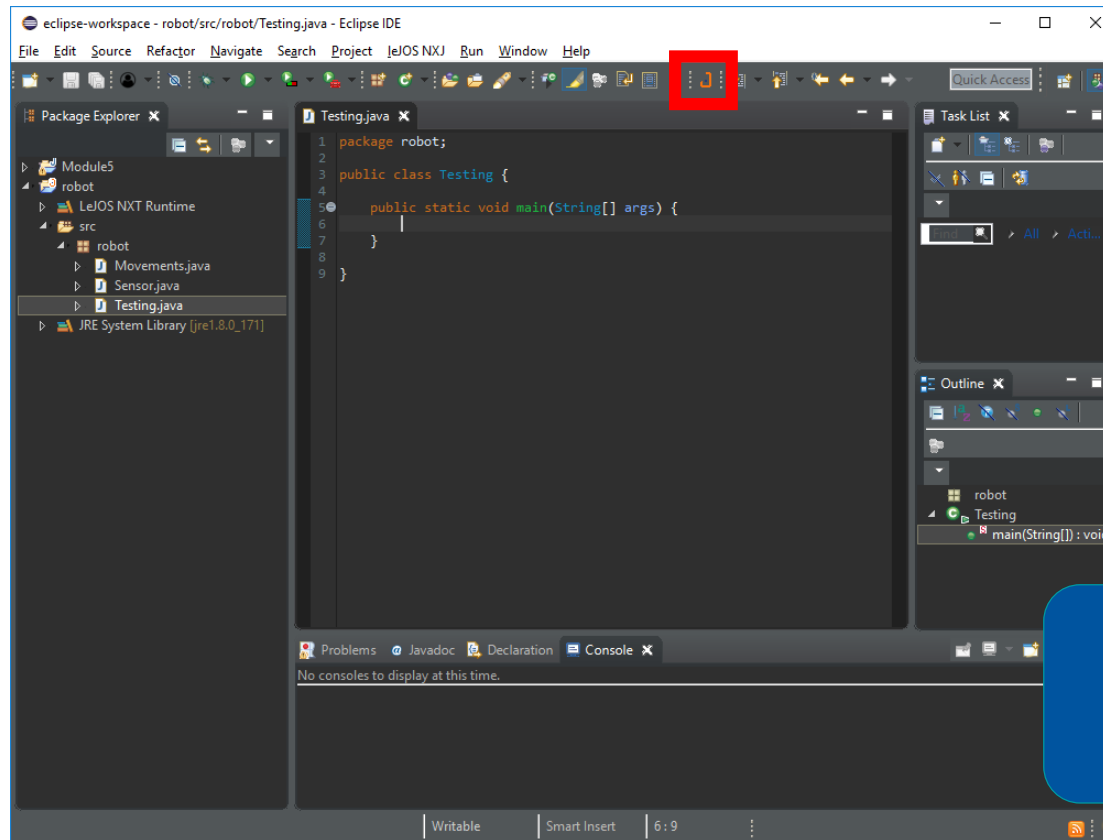
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## Install robot software in Eclipse



# Preparing for Robot Programming

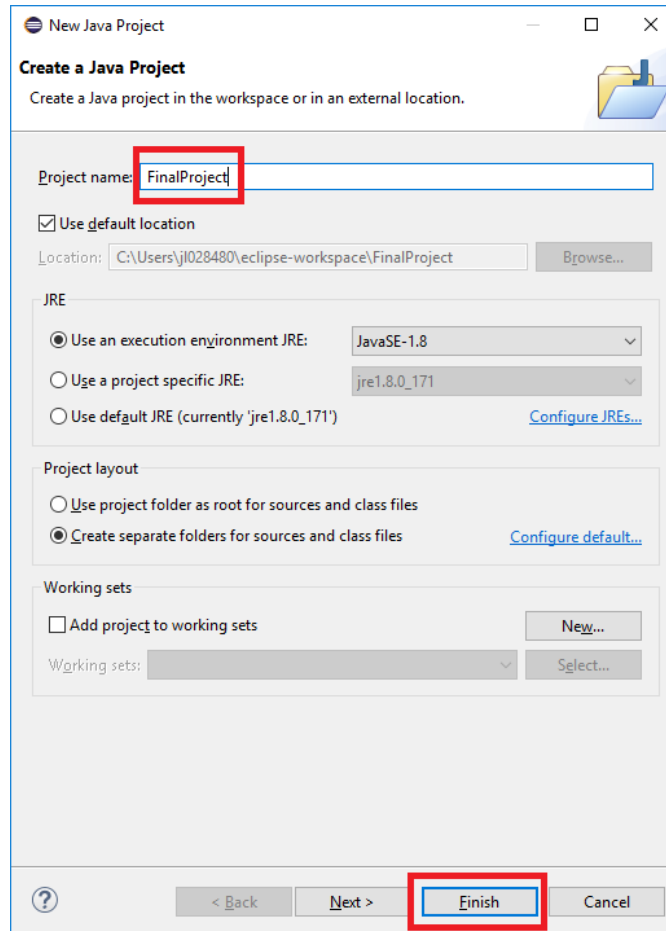
## Install robot software in Eclipse



Success!

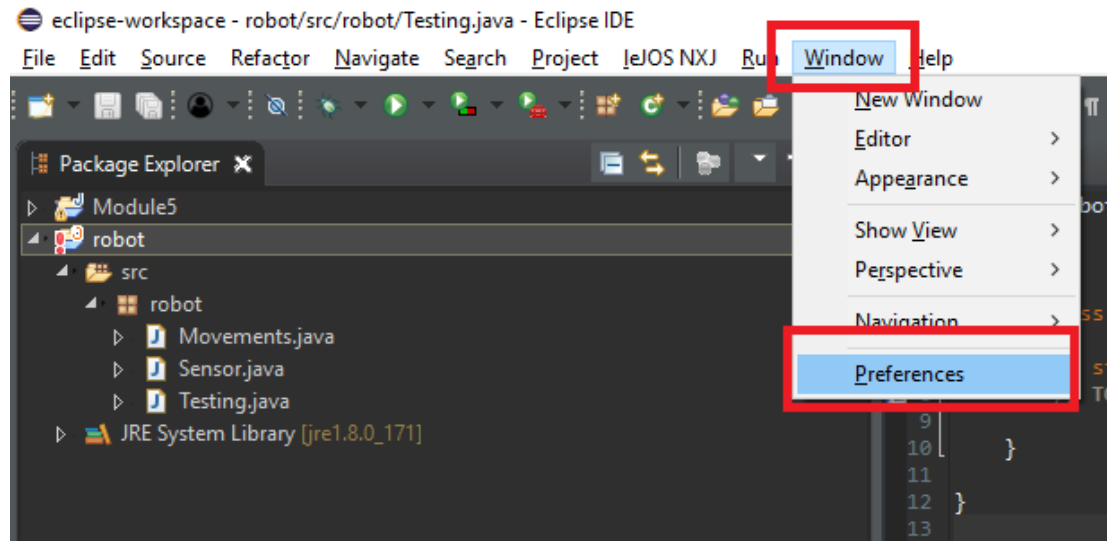
# Preparing for Robot Programming

## Create a Java project “FinalProject”



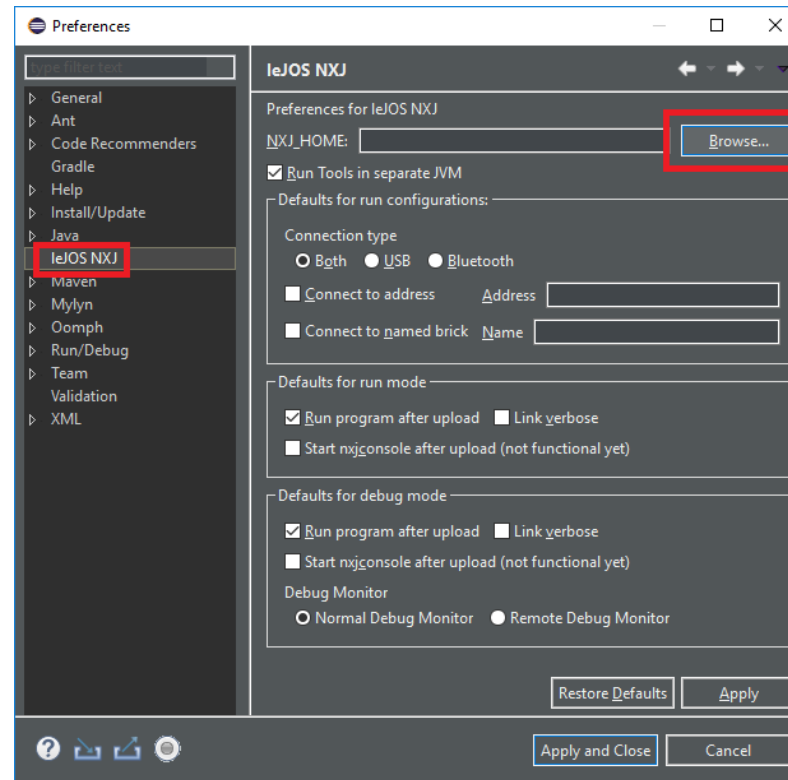
# Preparing for Robot Programming

## Eclipse settings



# Preparing for Robot Programming

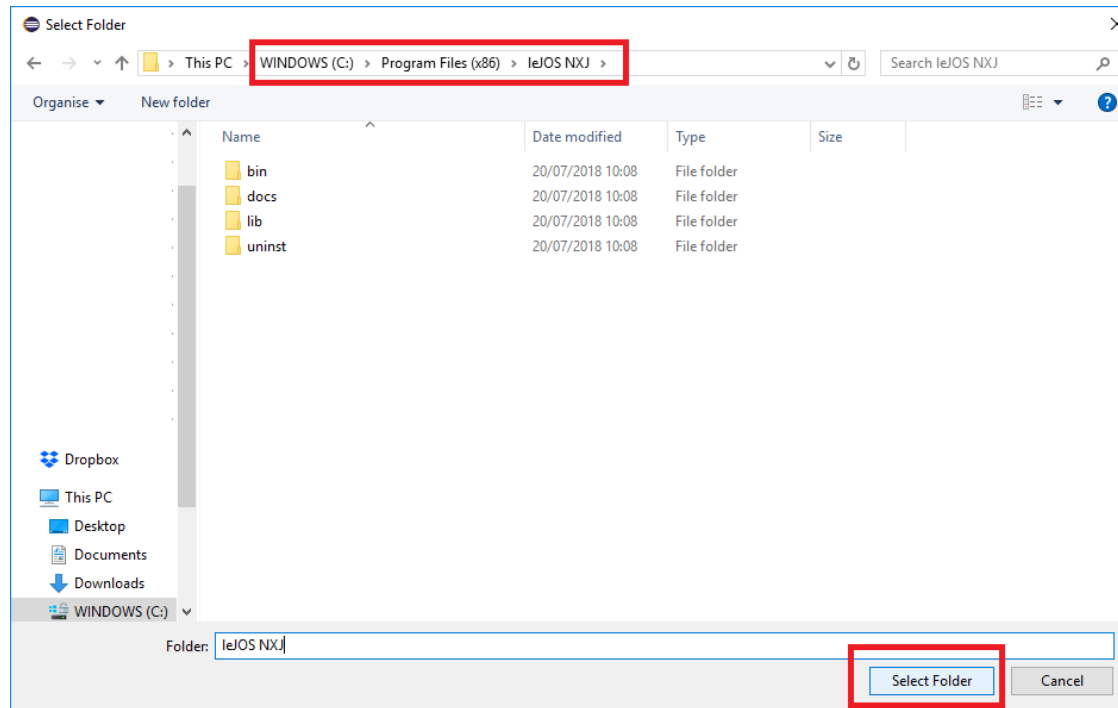
## Eclipse settings





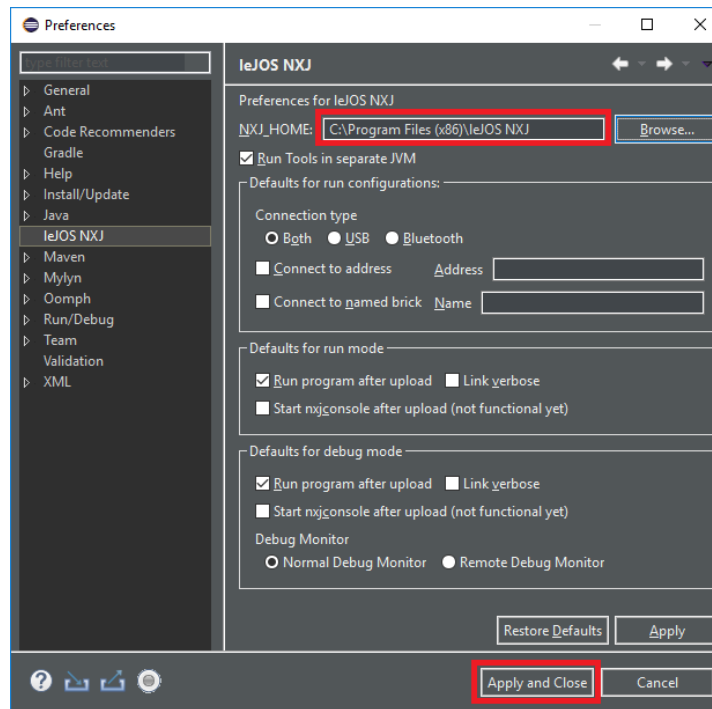
# Preparing for Robot Programming

## Eclipse settings



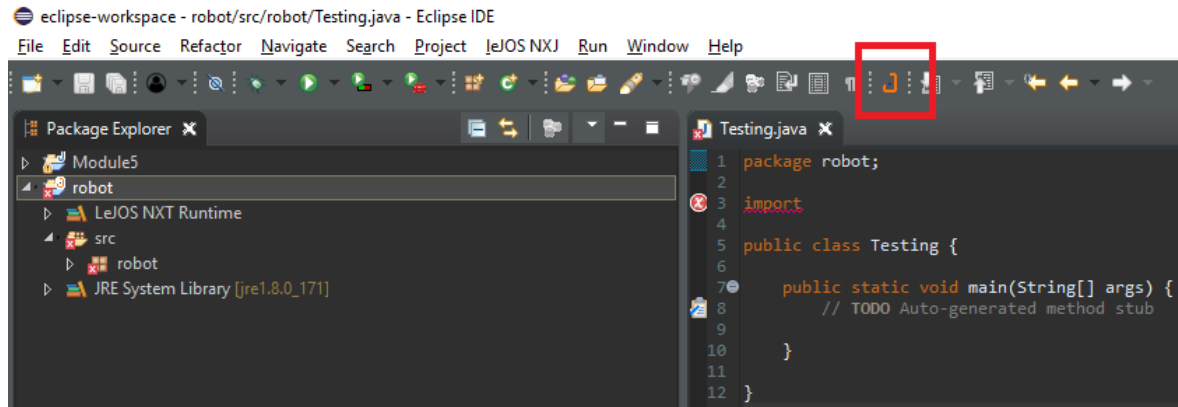
# Preparing for Robot Programming

## Eclipse settings



# Preparing for Robot Programming

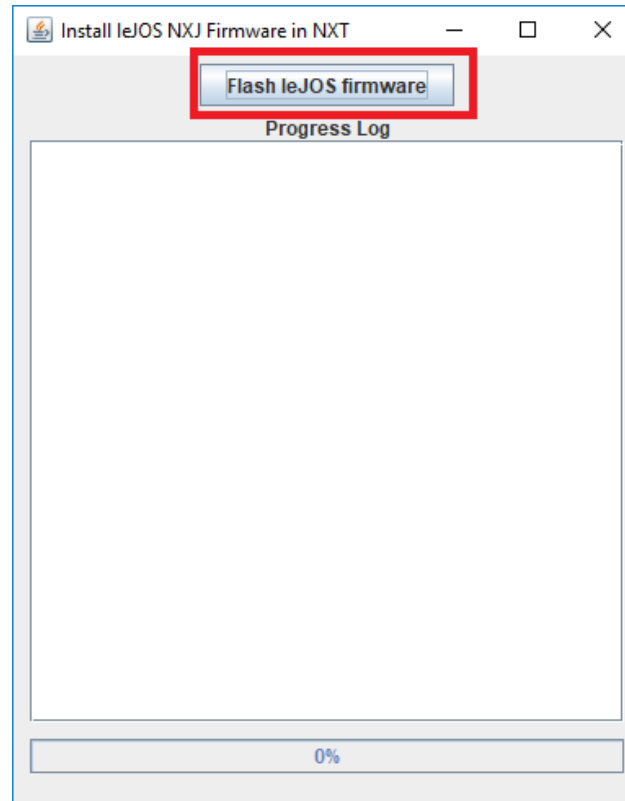
## Use leJOS to access the robot!



# Preparing for Robot Programming

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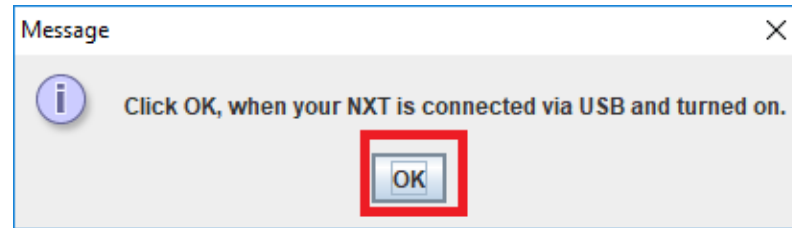
**Use leJOS to access the robot!**



# Preparing for Robot Programming

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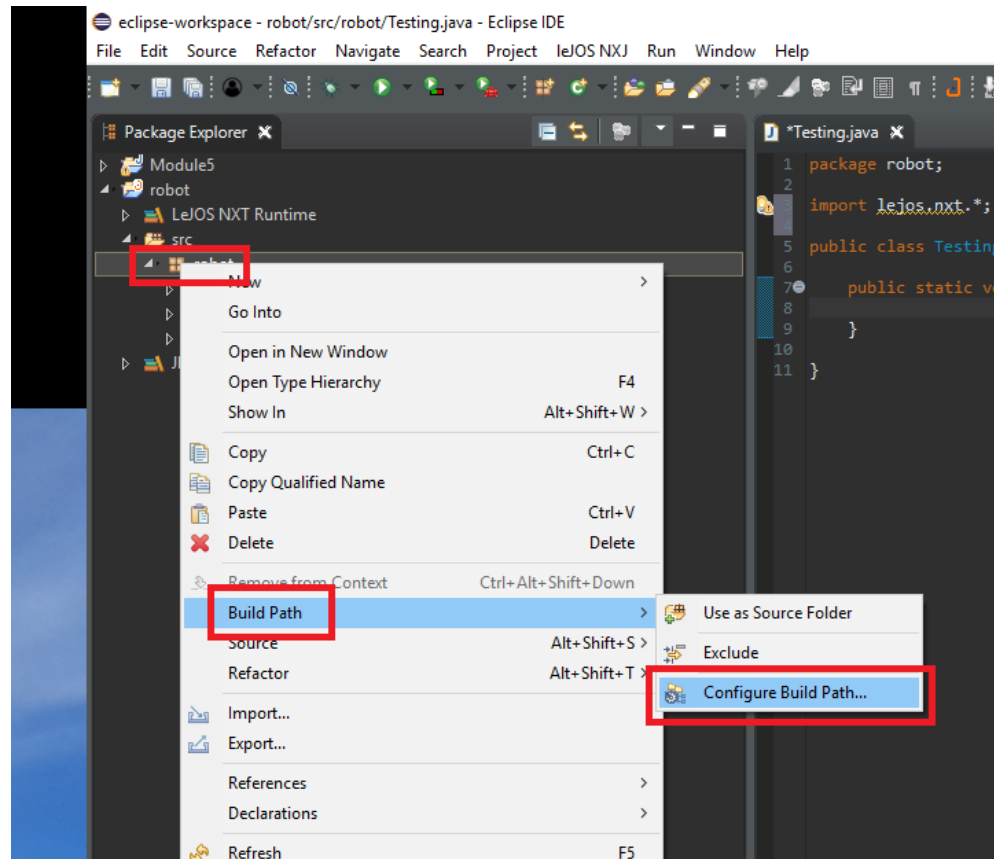
**Use leJOS to access the robot!**



**Beep-beep on the robot  
→ Success!**

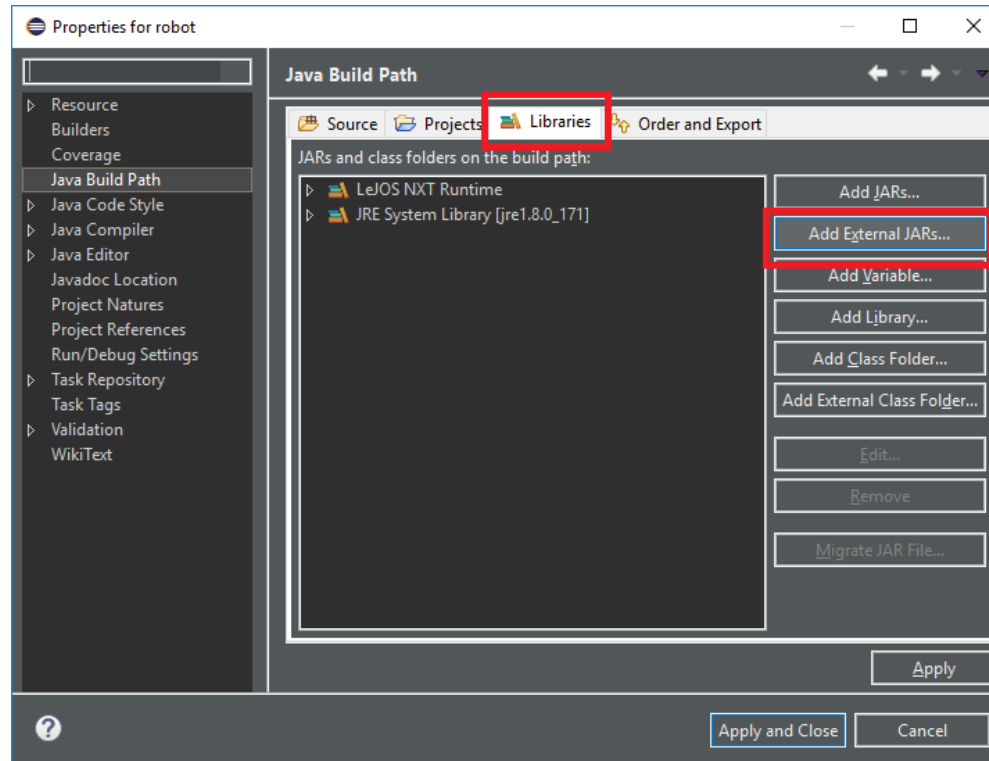
# Preparing for Robot Programming

## Final step: Settings



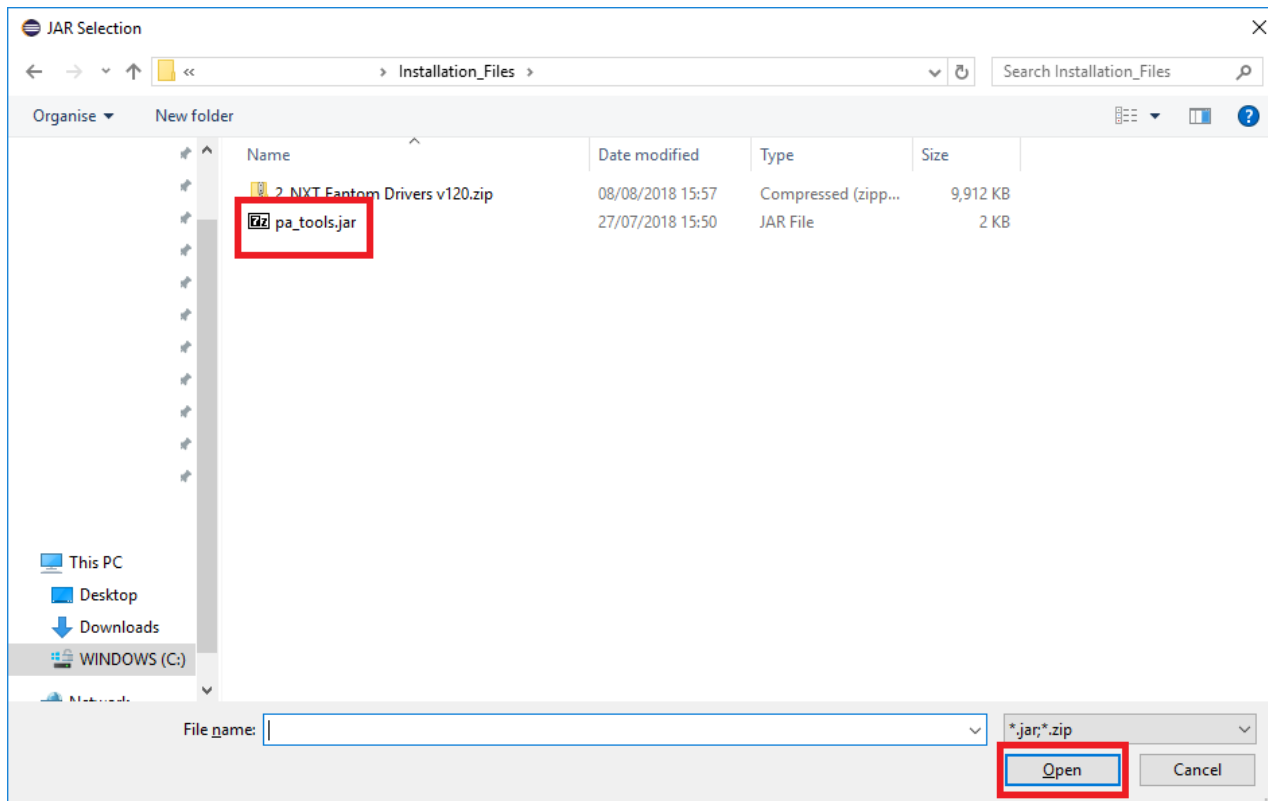
# Preparing for Robot Programming

## Final step: Settings



# Preparing for Robot Programming

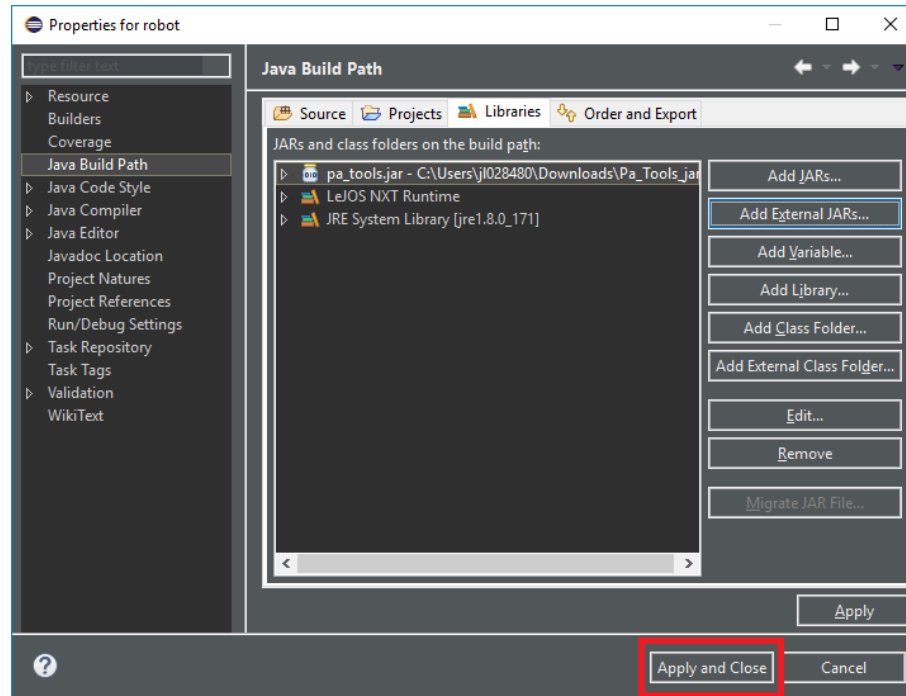
## Final step: Settings





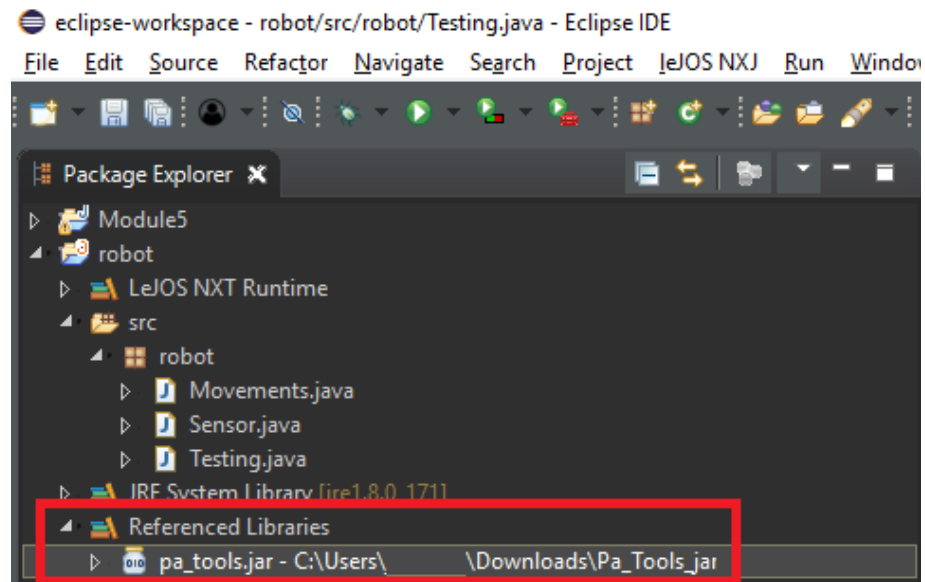
# Preparing for Robot Programming

## Final step: Settings



# Preparing for Robot Programming

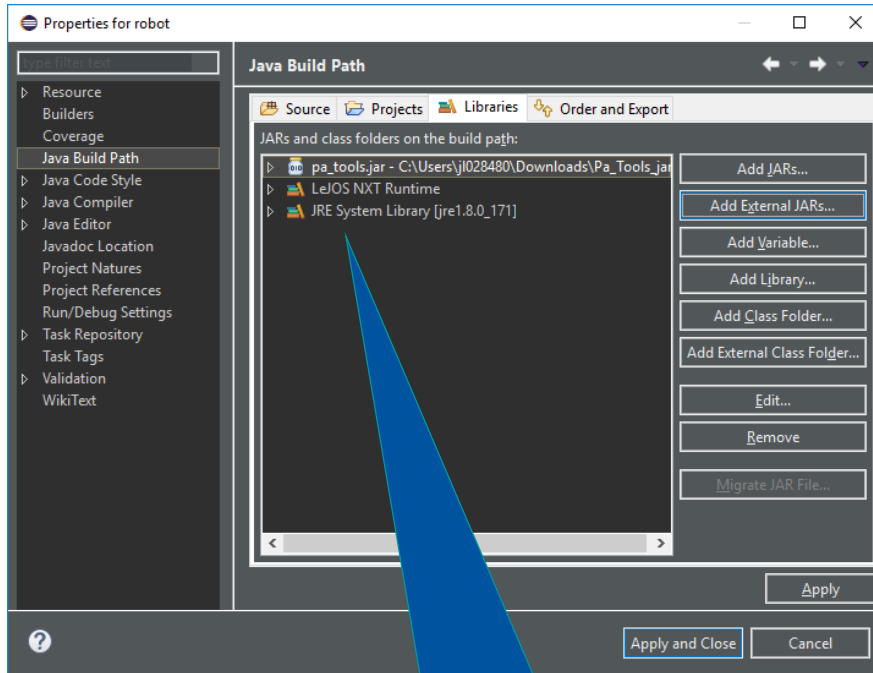
## Final step: Settings



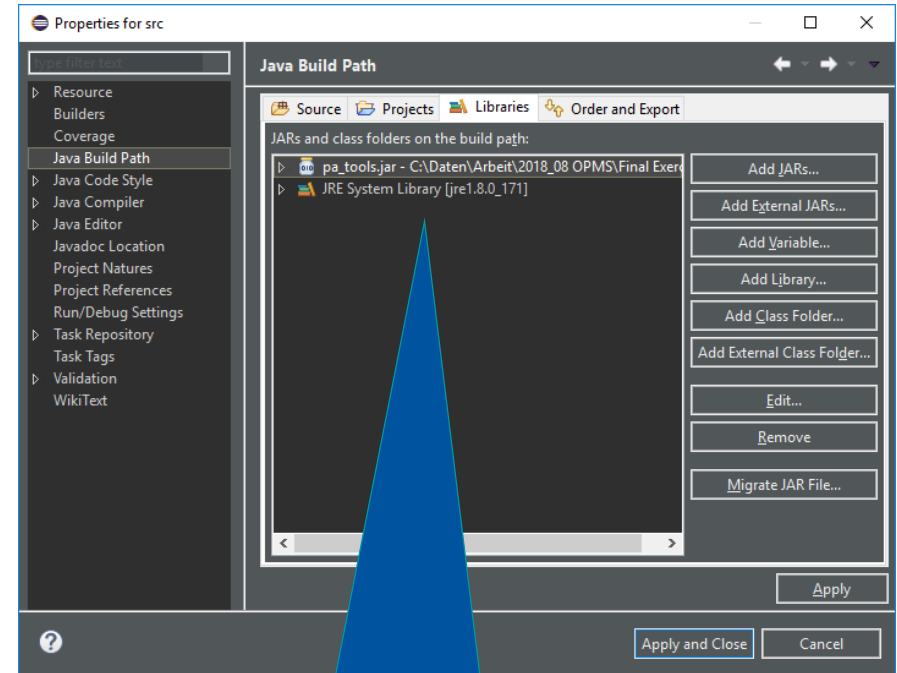
**Success!**

# Preparing for Robot Programming

## Final step: Settings



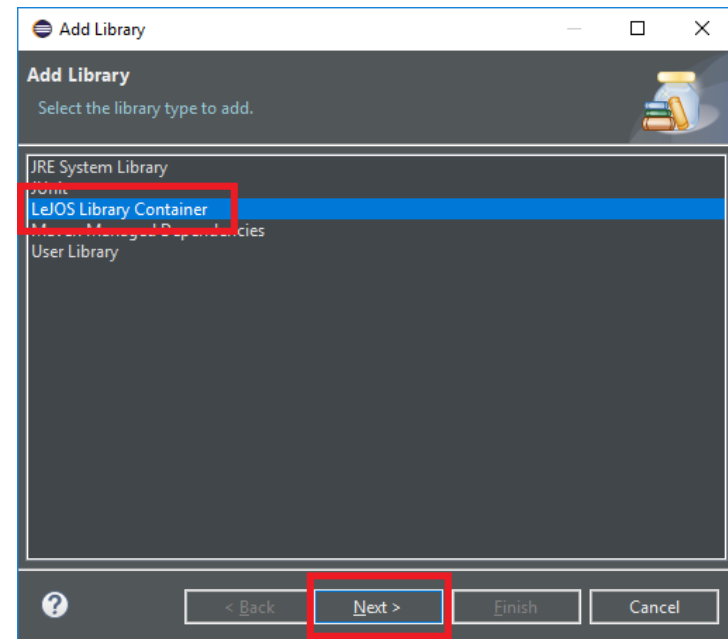
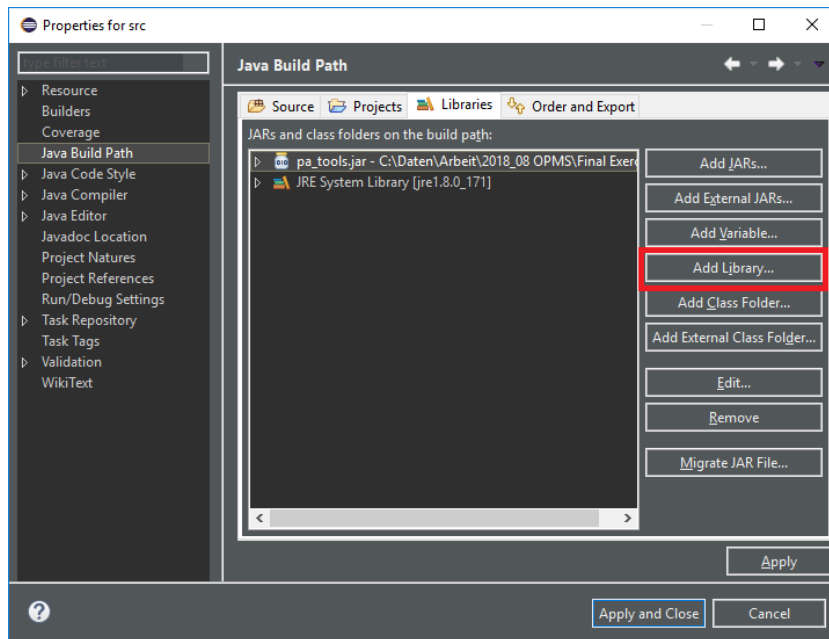
**3 entries?**  
→ **You are done!**



**2 entries?**  
→ **Just one more step**

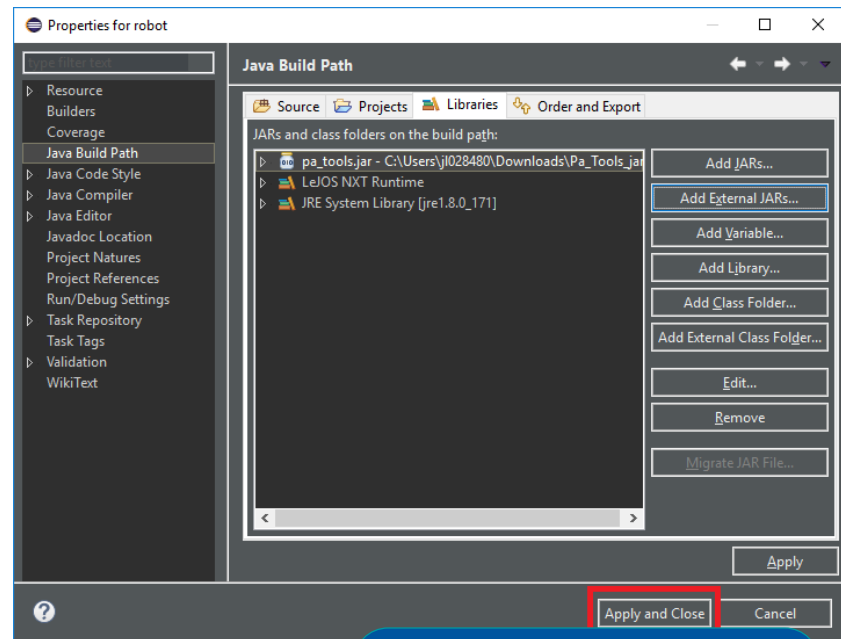
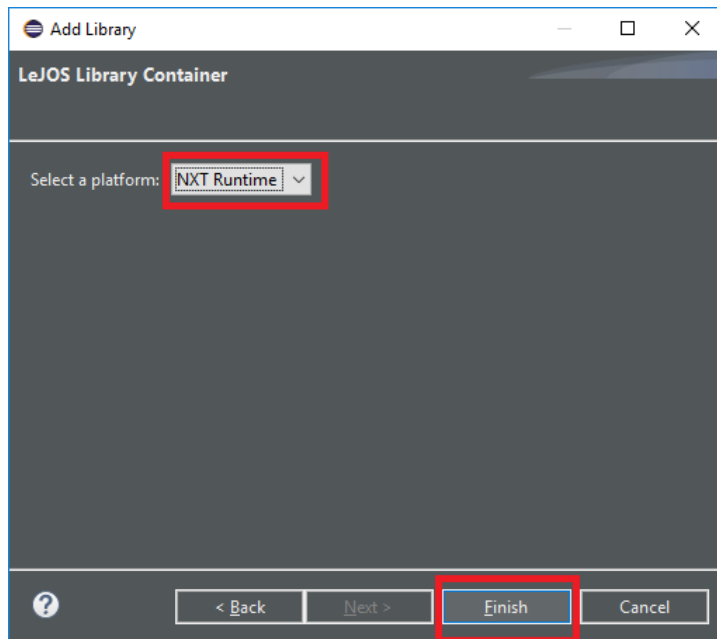
# Preparing for Robot Programming

## Final step: Settings



# Preparing for Robot Programming

## Final step: Settings



**Success!**



**Thank you very much!**