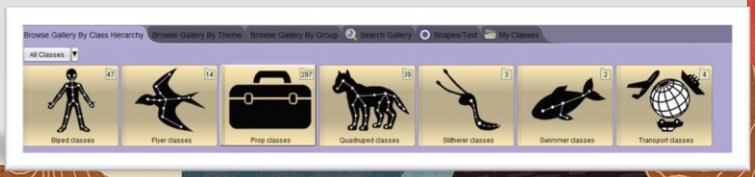
ORACLE

Academy

Java Fundamentals

2-1

Getting Started with Alice 3



ORACLE
Academy

Copyright © 2022, Oracle and/or its affiliates. Oracle, Java, and MySQL are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

Objectives

- This lesson covers the following objectives:
  - Identify scene components
  - Create and save a new project
  - Add an object to a scene
  - Communicate the value of saving multiple versions of a scene
  - Code a simple programming instruction
  - Use the copy and undo command
  - Understand the value of testing and debugging

Copyright © 2022, Oracle and/or its affiliates. Oracle, Java, and MySQL are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

Initial Scene

- An initial scene is the starting point of your animation
- It has three components:
  - A background template which provides the sky, ground, and light
  - Non-moving scenery objects which provide the setting
  - Moving objects which provide the action

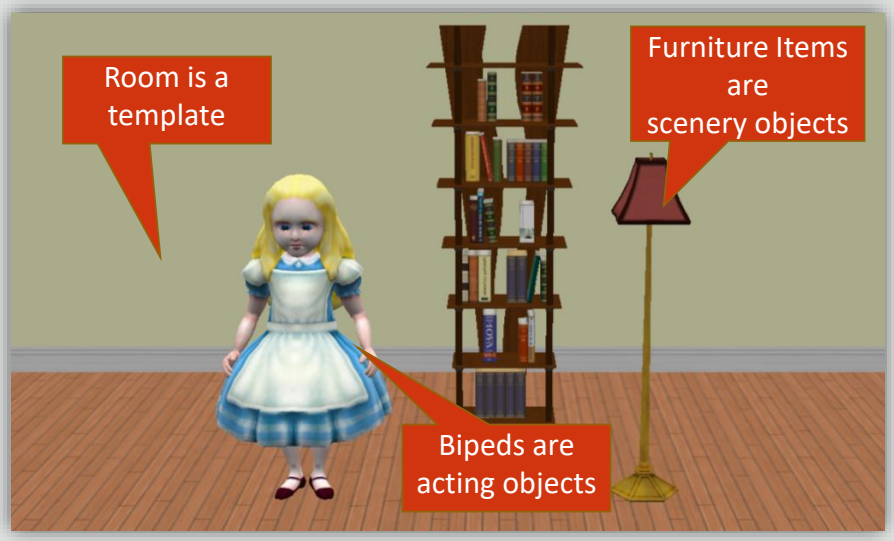
The initial scene is the first scene of an animation where you select the background template and position the objects

Copyright © 2022, Oracle and/or its affiliates. Oracle, Java, and MySQL are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

The initial scene is how you lay out your characters (objects) in your world.

Initial Scene Components

- Below are components of a room scene



ORACLE Academy

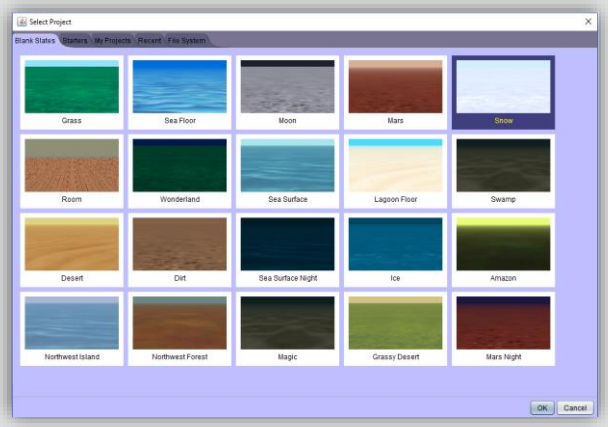
JF 2-1
Getting Started with Alice 3

Copyright © 2022, Oracle and/or its affiliates. Oracle, Java, and MySQL are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

You have a range of different types of objects available to you in Alice. Each one performs a different function within your animation.

Steps to Create a New Project

- Launch Alice 3
- In the Welcome dialog box, select the Blank Slates tab
- Select a template, and click OK

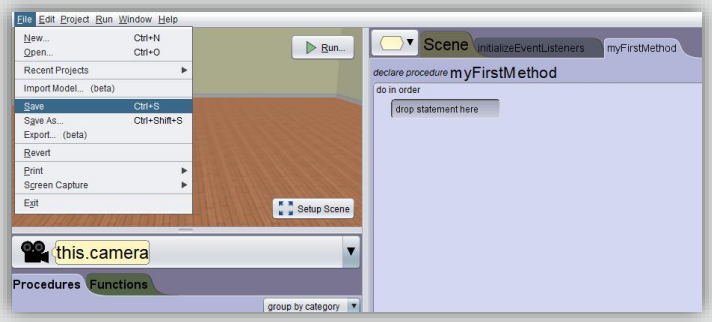


ORACLE Academy

Copyright © 2022, Oracle and/or its affiliates. Oracle, Java, and MySQL are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

Steps to Save a Project

- In the File menu, select Save As
- Select the location to save the project (i.e., computer, file server, memory stick)
- Enter the project name
- Click Save
- Save projects frequently to avoid losing your work



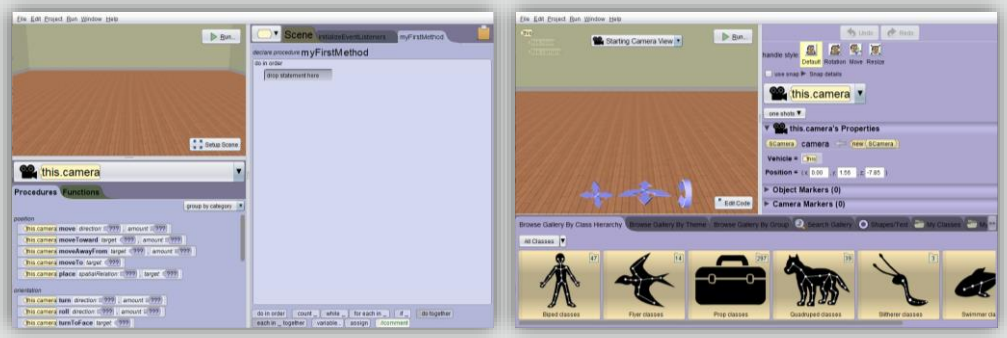
ORACLE Academy

JF 2-1
Getting Started with Alice 3

Copyright © 2022, Oracle and/or its affiliates. Oracle, Java, and MySQL are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

Navigating Between Editors

- Alice provides two different workspace editors, called perspectives, that you will toggle between frequently as you build your project
- The two editors are:
  - Code editor (Edit Code perspective, shown on the left)
  - Scene editor (Setup Scene perspective, on the right)

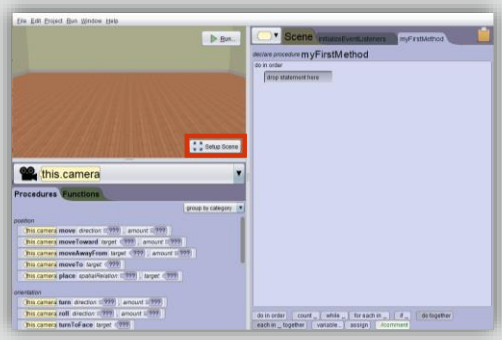


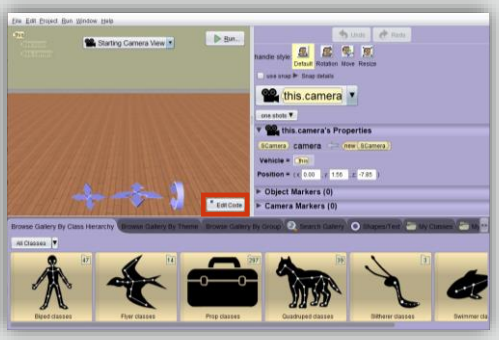
Copyright © 2022, Oracle and/or its affiliates. Oracle, Java, and MySQL are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

It is a good idea to familiarize yourself with the contents of both of these workspaces.

Navigating Between Editors

- Switch between the two editors by using either the Edit Code button or Setup Scene button
- You are in the Code editor when you see programming instructions in the left window pane
- You are in the Scene editor when you see the gallery of objects



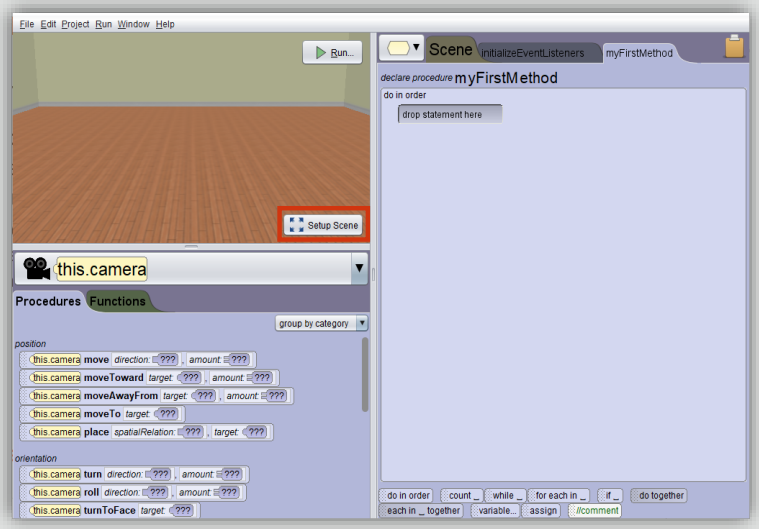


Copyright © 2022, Oracle and/or its affiliates. Oracle, Java, and MySQL are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

You will have to switch between editors a lot in Alice as you add more objects or more code to your animations.

The Default Editor

- By default, Alice starts in the Code editor
- Click the Setup Scene button to switch to the Scene editor



Copyright © 2022, Oracle and/or its affiliates. Oracle, Java, and MySQL are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

You drag your programming statements into the code window from here. This is where you will build your animations.

Add an Object to a Scene

- In the Scene editor, add an object (instance of a class) to a scene in one of two ways:
  - Drag an object from the gallery into the scene with your mouse, complete the dialog box
  - Alice 3 adds the object where you placed it in the scene
  - Click the object, complete the dialog box, and let Alice 3 add the object to the center of the scene

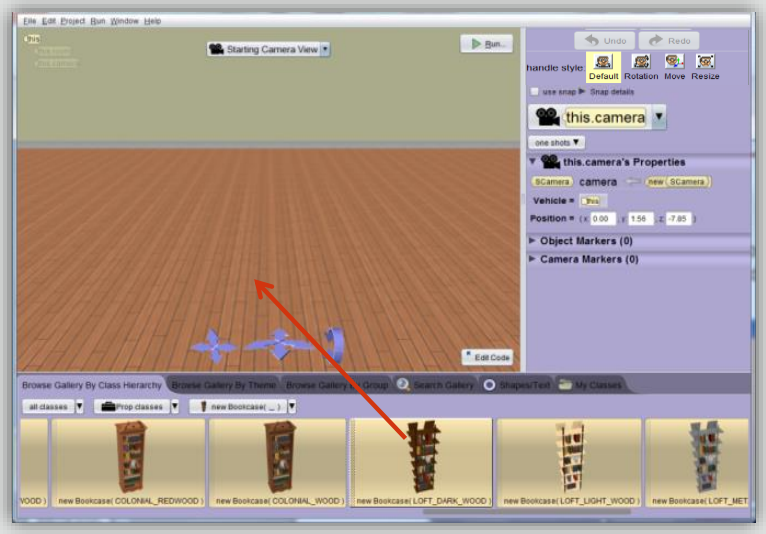
In programming terms, a class is a blueprint used to build an object, and an object is an instance of a class.
After an object is added to a scene, it is referred to as an instance of the object.
You can add many instances of the same object to a scene (multiple coral objects in the water, for example)
Each instance must have a unique name.

Copyright © 2022, Oracle and/or its affiliates. Oracle, Java, and MySQL are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

The two ways of adding objects to the world lets you either add them manually or use one-shot procedures to line them up. You will normally use a combination of both when constructing complex scenes.

Add an Object to a Scene Display

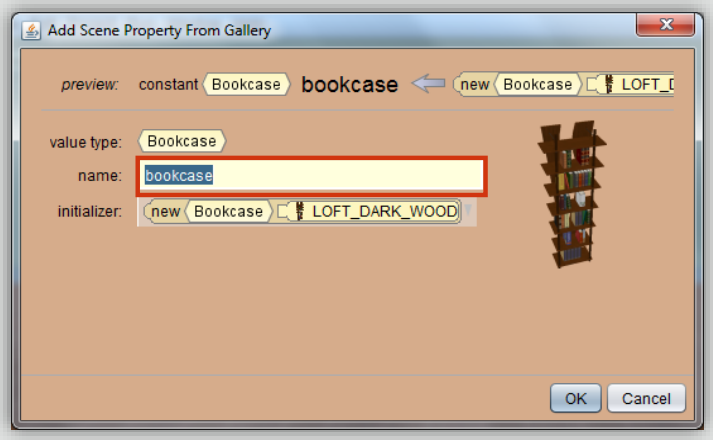
- Click the object once, or drag the object from the gallery into the scene with your mouse



Copyright © 2022, Oracle and/or its affiliates. Oracle, Java, and MySQL are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

Naming the Object

- Review the name provided for the object
- Modify the name, or click OK to accept the name and add the instance to the scene



ORACLE Academy

JF 2-1
Getting Started with Alice 3

Copyright © 2022, Oracle and/or its affiliates. Oracle, Java, and MySQL are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

If you give your objects a name then use a name that describes what the object is.

Scene Editor

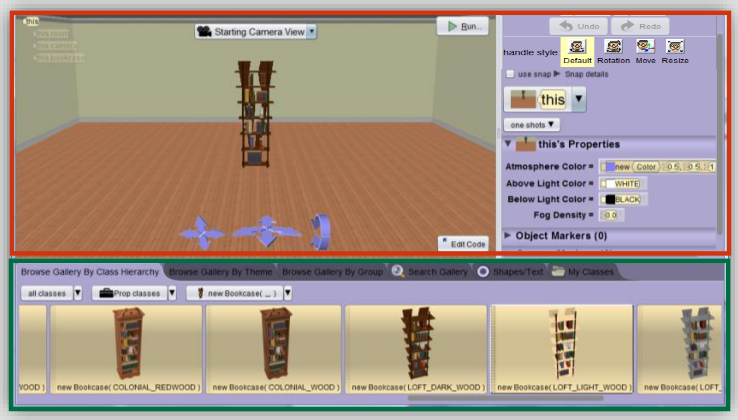
- In the Scene editor, you can:
  - Select objects from the gallery to add to the scene
  - Position objects in the scene using the Handles palette
  - Edit an object's properties using the Properties panel
  - Access the Code editor to add programming statements
  - Run the animation after the programming statements are added to the Code editor

Copyright © 2022, Oracle and/or its affiliates. Oracle, Java, and MySQL are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

Experiment with all of the tools available in the scene editor. Remember if you do something you regret you can always use undo to reverse the action.

Scene Editor Display

- The Scene editor contains two panels:
  - Scene Setup at the top
  - Gallery at the bottom



ORACLE Academy

Copyright © 2022, Oracle and/or its affiliates. Oracle, Java, and MySQL are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

When you first add objects to an Alice world experiment with changing the properties of the object in the scene setup panel.

Gallery

- The gallery is a collection of three-dimensional objects that you can insert into the scene
- The gallery is organized using tabs
- To find objects, browse the gallery tabs or use the Search Gallery feature to search by keyword
- Breadcrumb menus display as you select classes

ORACLE Academy

Copyright © 2022, Oracle and/or its affiliates. Oracle, Java, and MySQL are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

There are lots of different ways the gallery objects can be accessed. Use all of the tabs in the gallery to see which way you prefer.

Gallery Tabs

- The gallery has six tabs:

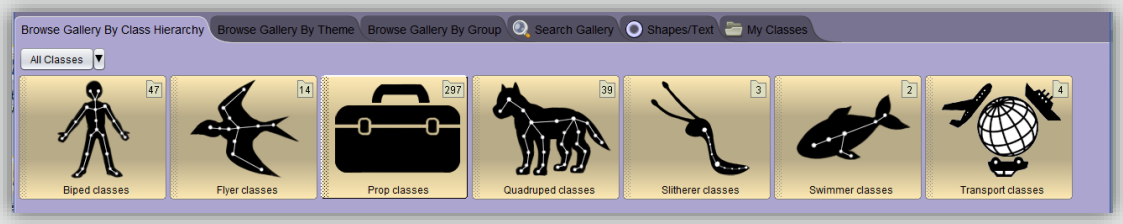
Tab	Function
Browse Gallery by Class Hierarchy	Organizes objects by mobility
Browse Gallery by Theme	Organizes objects by region and folklore context
Browse Gallery by Group	Organizes objects by categories
Search Gallery	Allows an object search by name
Shapes/Text	Organizes object shapes, 3D text, and the billboard
My Classes	Allows you to add external classes into your project

Copyright © 2022, Oracle and/or its affiliates. Oracle, Java, and MySQL are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

Select a Class

- The Class Hierarchy tab groups objects by mobility type (biped, flyer, etc)

A class contains the instructions that define the appearance and movement of an object. All objects within a class have common properties. The class provides instructions to Alice 3 for creating and displaying the object when it is added to your scene.



ORACLE Academy

JF 2-1
Getting Started with Alice 3

Copyright © 2022, Oracle and/or its affiliates. Oracle, Java, and MySQL are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

The main tab shows a hierarchy of objects with the number in the corner representing the number of sub-groups available.

Class Example

- Classes can contain sub-classes
- Consider the example below:
  - The Alice class is a sub-class of the Biped class
  - There are two Alice sub-classes in the gallery
  - Every Alice added to a scene inherits the properties that all Biped objects have in common:
    - two legs
    - moveable joints
    - etc

ORACLE Academy

Copyright © 2022, Oracle and/or its affiliates. Oracle, Java, and MySQL are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

The Alice that you choose from this gallery area would differ only in appearance. The actions available to both Alice classes are identical as they are both bipeds.

Save New Project Version

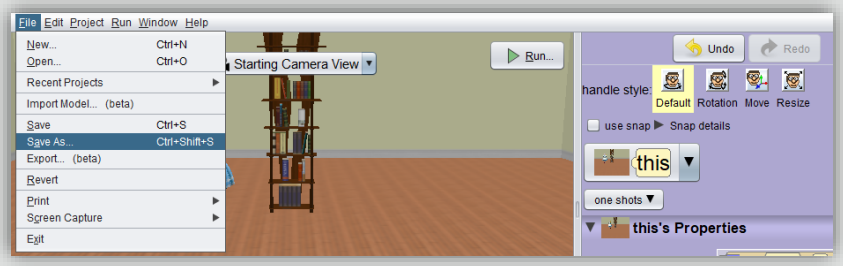
- Save time by creating multiple versions of your project
- After objects are positioned in the initial scene, save multiple versions of your project, giving each version a different name
- Benefits of saving multiple versions of projects:
  - Use the same scene to create different animations
  - Save time re-creating the scene if you encounter programming errors

Copyright © 2022, Oracle and/or its affiliates. Oracle, Java, and MySQL are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

Alice 3 can require a lot of computing resources so to avoid losing any work it is essential that you save your animation often. Always save before a major change, test the change and then save again if successful.

Steps to Save a Project Version

- With file open, select Save As...
- Select the location to save the project (i.e., computer, file server, memory stick)
- Enter the project name
- Click Save
- Save projects frequently in case of a power failure or a computer crash



Copyright © 2022, Oracle and/or its affiliates. Oracle, Java, and MySQL are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

Code Editor

- Click the Edit Code button to display the Code editor
- The Code editor is where you add the programming instructions to program your animation

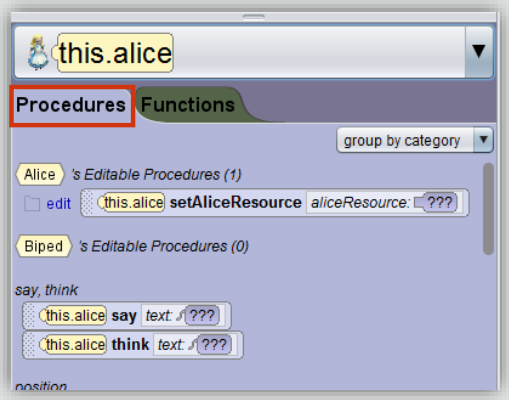
Copyright © 2022, Oracle and/or its affiliates. Oracle, Java, and MySQL are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

The code editor that is accessed via the Edit Code button is where you drag programming statements on to. Alice is a drag and drop environment that makes for an easy introduction to object oriented programming.

Methods Panel

- The Procedures tab, located within the Methods Panel in the Code editor, displays pre-defined methods for the selected instance, as well as methods defined for the class of objects

A procedure is a piece of program code that defines how the object should execute a task. Alice 3 has a set of procedures for each class; however, users can create or "declare" new procedures.



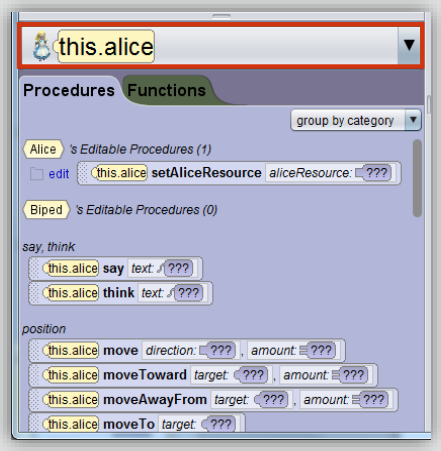
ORACLE Academy

Copyright © 2022, Oracle and/or its affiliates. Oracle, Java, and MySQL are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

The methods panel gives you access to code that will allow you to manipulate your chosen object. You choose the object from the drop down list and the actions you want to carry out with that object are available within the procedures tab.

Instance Menu in Methods Panel

- The instance menu displays above the Procedures tab
- The down pointing triangle on the right side of the menu indicates that the menu drops down when selected



Copyright © 2022, Oracle and/or its affiliates. Oracle, Java, and MySQL are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

Each instance of an object that exists within your animation is available through the instance menu. This is how you choose which object you are programming.

Create a Programming Instruction

- From the Methods Panel, click and drag the desired programming instruction into the myFirstMethod tab of the Code editor

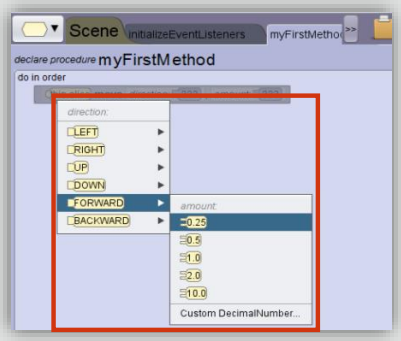
Copyright © 2022, Oracle and/or its affiliates. Oracle, Java, and MySQL are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

Programming statements from the procedures tab can be dragged into the code editor. Click on the required procedure and then drag and drop it into the required position in the code editor.

Select Values for Method Arguments

- After you drag the programming instruction into the myFirstMethod tab, use the cascading menus to select the value for each argument used in the method

An argument is a value that is used by the method to perform an action



ORACLE Academy

JF 2-1
Getting Started with Alice 3

Copyright © 2022, Oracle and/or its affiliates. Oracle, Java, and MySQL are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

When you first start out with Alice the values tend to be judged using trial and error. Practice will make you more aware of distances within an Alice world and will allow you to plan these values before coding them.

Procedure Argument Types

- Argument types may include:
  - Direction
  - Amount
  - Duration
  - Text
- Alice 3 recognizes how many arguments are needed for each programming instruction
- It presents you with the correct number of cascading menus to specify the values for each of those arguments

Copyright © 2022, Oracle and/or its affiliates. Oracle, Java, and MySQL are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

Copy Programming Instructions

- To copy a programming instruction, you may use any one of these methods:
  - The CTRL + Drag method copies the code
  - Right-click and use the Copy to Clipboard option copies the code
  - Click and dragging the programming instruction to the clipboard moves the code

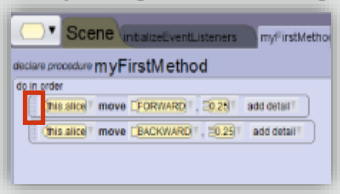
Copyright © 2022, Oracle and/or its affiliates. Oracle, Java, and MySQL are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

The CTRL+ Drag method is the quickest way of copying code with a single method. To copy code between classes or methods then use the copy to clipboard option. To move code from one place to another then drag it to the clipboard.

Note: For Mac users, use OPTION / ALT and Drag method to copy code.

Steps to Use the CTRL + Drag Method

- Hold down the CTRL key on your keyboard
- Click on and hold the programming instruction handle



- Drag the handle to the desired location in the code, or to the clipboard
- Release the mouse button before releasing the CTRL key

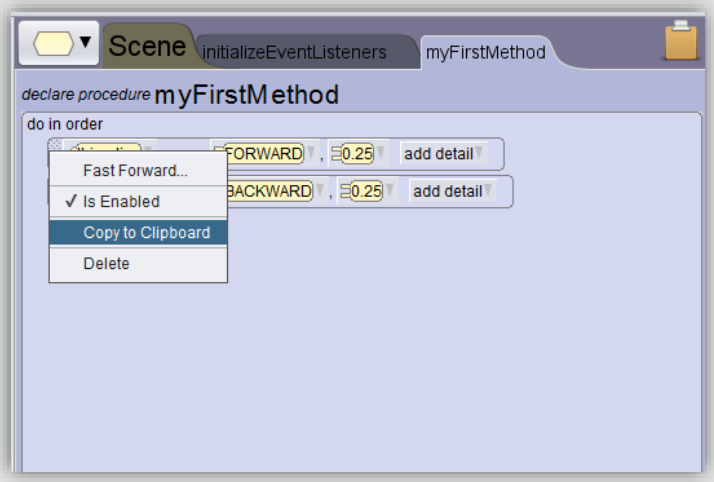
ORACLE Academy

Copyright © 2022, Oracle and/or its affiliates. Oracle, Java, and MySQL are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

Note: For Mac users, use OPTION / ALT and Drag method to copy code.

Steps to Use the Right-Click Copy Method

- Right-click on the programming instruction handle
- Select the Copy to Clipboard option

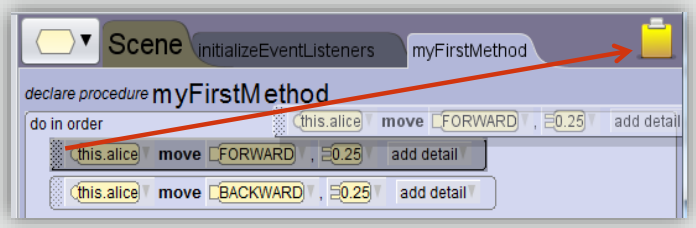


ORACLE Academy

Copyright © 2022, Oracle and/or its affiliates. Oracle, Java, and MySQL are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

Steps to Use the Click + Drag To Clipboard Method

- Click and drag the programming instruction to the clipboard icon
- The clipboard changes color when the mouse pointer makes contact with the clipboard icon
- Use this method when moving programming instructions between tabs



ORACLE Academy

Copyright © 2022, Oracle and/or its affiliates. Oracle, Java, and MySQL are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

The clipboard uses a LIFO (Last In First Out) method of dealing with its contents.

Steps to Use the Click + Drag To Clipboard Method

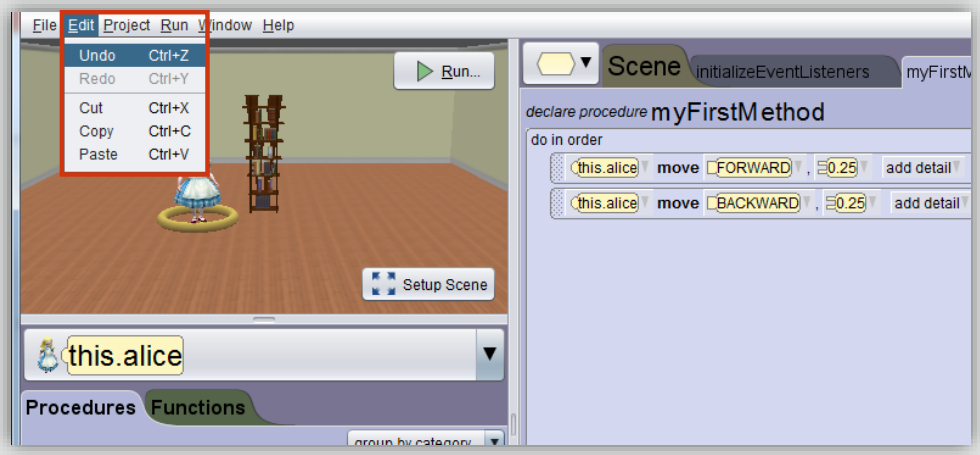
- The clipboard can store multiple programming instructions at the same time
- They are dragged from the clipboard in the opposite order that they were placed on it
- The clipboard displays the number of items stored on it

Copyright © 2022, Oracle and/or its affiliates. Oracle, Java, and MySQL are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

The clipboard uses a LIFO (Last In First Out) method of dealing with its contents.

Undo an Action

- Undo an action using the Undo option on the Edit menu, or the keyboard shortcut CTRL + Z



Copyright © 2022, Oracle and/or its affiliates. Oracle, Java, and MySQL are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

CTRL + Z is the standard keyboard shortcut for undo. This will work in most applications.

Test and Debug Your Animation
Testing

- Once you create the programming instructions for your animation, you need to test your program
- To test your program, click the Run button
- Run the animation to test that it functions properly and executes as planned and without error
- Test the animation frequently during development

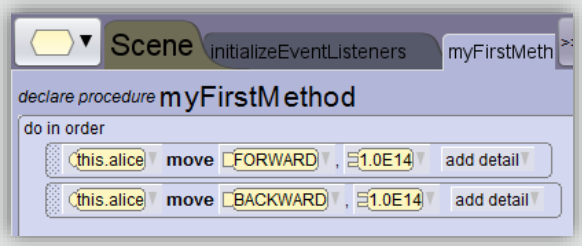
ORACLE Academy

Copyright © 2022, Oracle and/or its affiliates. Oracle, Java, and MySQL are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

Remember to test a program successfully you need to know what it is supposed to do. Always have a clear idea of what your animation should do before clicking on the run button.

Test and Debug Your Animation
Testing the Limits of Your Program

- Testing the limits of your program is an important part of the process
- For example, change the value of an argument in a procedure to intentionally "break" the code proves the code works under extreme conditions
- What happens if a number is very large? or negative?
- Test the limits of the animation frequently during development



ORACLE Academy

Copyright © 2022, Oracle and/or its affiliates. Oracle, Java, and MySQL are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

Always keep a record of what tests you have carried out and if they were successful or not. The ability to create a comprehensive test strategy will stand you in good stead as you progress through your programming career.

Test and Debug Your Animation
Debugging

- Debugging your program refers to the cycle that involves:
  - testing your program
  - identifying errors or unintended results
  - rewriting the code and re-testing

Software programs, such as animations, are tested by entering unanticipated commands to try and "break" the code. When something is broken or doesn't work as intended in a software program, it is often referred to as a "bug". Debugging is the process of finding bugs in a software program.

Copyright © 2022, Oracle and/or its affiliates. Oracle, Java, and MySQL are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

Testing is not a one-shot process. You must always test, fix any errors and then re-test your code.

Testing and Debugging Techniques

- Use some of the following techniques as you program the animation in Alice 3:
  - Adjust the arguments that specify the direction, distance, and duration that objects move
  - Adjust the mathematical expressions that manipulate the direction, distance, and duration that objects move
  - Refine or replace instructions in the code that do not work as intended
  - Resolve errors created by the programmer

Copyright © 2022, Oracle and/or its affiliates. Oracle, Java, and MySQL are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

Changing the values of arguments can be a good way of getting a better understanding of how the code works. Experiment with the arguments by changing their values and take a note of the difference it makes to the animation.

Terminology

- Key terms used in this lesson included:
  - Argument
  - Bug
  - Class
  - Code editor
  - Debugging
  - Gallery
  - Initial scene
  - Instance
  - Procedure
  - Scene editor
  - Template

Copyright © 2022, Oracle and/or its affiliates. Oracle, Java, and MySQL are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

Summary

- In this lesson, you should have learned how to:
  - Identify scene components
  - Create and save a new project
  - Add an object to a scene
  - Communicate the value of saving multiple versions of a scene
  - Code a simple programming instruction
  - Use the copy and undo commands
  - Understand the value of testing and debugging

Copyright © 2022, Oracle and/or its affiliates. Oracle, Java, and MySQL are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

ORACLE
Academy