

# Kids College – Computer Game Programming

## Exploring Alice and Object-Oriented Programming

Alice is a programming language developed by Carnegie Mellon that makes it easy to write object-based, event driven, 3D animation and game programs with a cast that can be selected from hundreds of available objects. The latest version can be downloaded for free from [www.alice.org](http://www.alice.org). It is our hope that you enjoyed learning to program today and that you will continue to explore this creative academic learning environment.

### Installing Alice

- Open a web browser such as Internet Explorer or Mozilla Firefox. Navigate to [www.alice.org](http://www.alice.org), under Downloads select the link Alice 2.2, select the link Download Alice 2.2 for Windows. Make sure the radio button, Save file is selected, click OK
- Use Ctrl-J to open the Downloads folder, double click on Alice 2.2.zip and then click on Extract all files. Using the Browse button, navigate to where you would like Alice. For class, select Desktop

### Starting Alice

- Navigate to the location (desktop) where the Alice.exe program has been installed on your computer, or where a shortcut to the Alice.exe program has been placed
- Double-click the Alice icon. If file extensions are visible on your system it will be named Alice.exe
- If the security warning “The publisher could not be verified. Are you sure you want to run the software?” appears, click the run button

### Creating a New Ice Skater World

- Click the Templates tab on the Welcome to Alice! dialog box
- Click the snow template and then click the Open button

### Entering Scene Editor Mode

- Click the ADD OBJECTS button in the lower-right corner of the World window

### Adding the Lake Object to the World

- Using the horizontal scroll bar at the bottom of the screen, scroll to the right until you can see the Environments tile. Click the tile to enter the Environments folder
- Scroll to the right until you can see the Lake tile, then click the tile once
- Click the Add instance to world button to add an instance of the Lake class to your world. It will take a few seconds for Alice to finish adding the object and all of its subparts to your world

### Adding the Ice Skater to the World

- Click the Move Up a Level button to go up one level in the Local Gallery’s tree of folders
- Scroll to the right until the People folder tile is visible, then click the People folder tile to enter the folder
- Take a moment to scroll back and forth through the folder and see some of the many characters that you can add to Alice worlds, then find and click the IceSkater class tile
- Click the Add instance to world button to add an instance of the IceSkater class to your world

### Saving the Alice World

- Click File on the menu bar to display the File menu, then click Save World on the File menu
- In the Save World As dialog box, click Computer, navigate to the flash drive where you wish to save your work, type **skaterHello** in the File name text box, and then click the Save button

### Positioning the iceSkater

- If you are not already in Scene Editor mode, click the ADD OBJECTS button to enter Scene Editor mode
- The Pointer tool is already selected. Click and drag the iceSkater back and to the right so that she is about 3 inches and close to the cabin in the background
- Select the Turn tool and turn the object so that she is facing toward the bottom left of the screen
- The iceSkater is now in place. Click the DONE button to close Scene Editor mode and return to the standard Alice interface

- Click File on the menu bar, then click Save World on the File menu to save the world again with the skater in position

### **Starting to Code world.my first method**

- Click the iceSkater tile in the Object tree and then click the properties tab in the Details area
- Drag a copy of the pose2 tile from the properties tab and drop it in the blank area below Do Nothing in the Editor area

### **Adding an Instruction to Make the iceSkater Spin**

- Click the methods tab in the Details area, then drag a copy of the iceSkater turn tile from the methods tab and drop it in the Editor area below the iceSkater set pose instruction
- Point to right on the direction menu
- Click other on the amount menu
- Type **2** in the text box and then click the Okay button

### **Adding Instructions to Make the iceSkater Change Poses While Moving**

- Drag a copy of the Do together tile from the bottom of the Editor area and drop it in the Editor area below the first two instructions
- Click the properties tab in the Details area, then drag a copy of the pose4 tile and drop it in place of Do Nothing in the Do together tile
- Click the methods tab in the Details area, then drag a copy of the iceSkater move tile and drop it just below the iceSkater set pose tile that you just put into place
- Point to forward on the direction menu, then click 2 meters on the amount menu. If 2 meters is not an option on the amount menu, click other..., type 2 in the Custom Number window, and then click the Okay button

### **Adding an Instruction to Make the iceSkater Spin Again**

- Drag a copy of the iceSkater turn tile from the Details area and drop it below the Do together tile in the Editor area
- Point to right on the direction menu, and then select 2 revolutions on the amount menu

### **Making the iceSkater Pose and Facing the Camera at the Same Time**

- Drag a copy of the Do together tile from the bottom of the Editor area and drop it in world.my first method, below all of the existing instruction tiles
- Click the methods tab in the Details area, scroll down if necessary, and then drag a copy of the iceSkater turn to face tile and drop it in the lower Do together tile
- Click camera to select it as the target that the ice skater should turn to face
- Click the properties tab in the Details area, then drag a copy of the pose tile and drop it in the Do together tile below the iceSkater turn to face camera instruction

### **Adding Instructions to Make the iceSkater Say “Hello, World!”**

- Click the methods tab in the Details area, then drag a copy of the iceSkater say tile and drop it onto world.my first method in the Editor area, below all of the existing instruction tiles
- Click other to display the Enter a string dialog box
- Type **Hello, World!** in the text box and then click the OK button to continue

### **Adding Instructions to Make the iceSkater Say “Hello, World!”**

- Click more on the IceSkater say Hello, World! instruction tile
- Point to duration to open the duration menu. If 3 seconds is not an option on the menu, then click other and use the calculator-style keypad to enter 3 as the amount. Click the Okay button
- Click File on the menu bar, and then click Save World on the File menu to save your world with its existing file name, skaterHello. As before, it will take a few seconds for Alice to save the world

### **Playing the skaterHello World**

- Click the Play button in the top left corner of the Alice interface to play the world, and see how it works
- Click the Stop button when finished playing the world
- Save the file to your flash drive and close Alice

## Creating an Alice Game – Guess the Number

### Game Play:

- The computer will pick a secret number
- You guess what number it is
- If your guess is too high or too low, you will be given a hint
- See how many turns it takes you to win!

## Getting Started

- Follow the instructions, **Starting Alice**
- Select a template of your choice
- Add at least two character objects using the Add Objects button

## Create Three Variables – pick, count, and guess

- Click on the create new variable button, type pick for the name, make sure that the radio button Number is selected and Value says 0 (you may have to click other... and select 0), click OK
- Do the same for count and guess

## Add Comments

- Select the // tile on the bottom, drag it under the variables, do this four times
- Double click on the first No comment, type your name
- Double click on the second No comment, type the date
- Double click on the third No comment, type “My First Game Program”
- Double click on the fourth No comment, type “This program plays a guess the number game”

## Set the Variable pick to a Random Number

- Click on World in the object tree (upper left box), click on the functions tab in the world’s details (lower left box)
- If it’s not already, expand random by clicking on the plus (+)
- Drag the variable pick tile and drop it below the comments, choose select value, value 1
- Drag the random number tile and place it on top of the 1 in the pick tile you just dropped, click on more... minimum set to 1, maximum set to 100, integerOnly set to true

## Introduce the Game to the User

- In the object tree, click on one of the characters, in the character’s details click on the methods tab, drag the character say tile and drop it under the pick tile you just created, click other... and enter your introduction to the game.
- One of the characters may say something such as “Please select a whole number between 1 and 100:”
- Add any dialog you would like, you may want to include how to play the game more completely

## Get the First Guess

- Drag the variable count tile and drop it below the pick tile, choose select value, value 1
- Click on World in the object tree, click on the ask user for a number tile and place it on top of the 1 in the guess tile you just dropped

## Repeat until the Correct Answer is Guessed

- Drag the While tile from the bottom and drop it below the guess tile, choose true
- Drag on the variable pick tile and drop it onto the true in the While tile you just placed, choose pick != expression guess

## Decide if the Guess is too Low or too High

- Drag the If/Else tile from the bottom and drop it where is says Do Nothing, choose true
- Click on the variable pick tile and drop it onto the true in the If/Else tile you just placed, choose pick < expression guess
- Select an object from the object tree, drag the tile to the space in the first Do Nothing, choose object say and indicate that the guess is too high

- Select a different object from the object tree, drag the tile to the space in the second Do Nothing, choose object say and indicate that the guess is too low

### **Update and Display the Number of Guesses**

- Click on the green Add Objects button. At the very end of the Gallery is 3D text. Place a 3D text object in your world, set the text to “Guess:” and the font to Arial. Place another 3D text object in your world, set the text to 0 and the font to Arial
- Drag the variable count tile and drop it below the If/Else tile you just placed, choose set value to 1
- Drag the variable count tile and drop it on the 1, open the drop down by the count you just placed, choose math, count + 1
- Select the 3D Text2 object in the object tree, click on the properties tab in the 3D Text2’s details, drag the text tile below the If/Else tile, still within the While tile loop
- Select the world object in the object tree, click on functions, drag the what as a string tile onto the 0, choose expressions, count

### **Ask the User for another Guess**

- Navigate to the guess tile above, right click on it and select make copy
- Drag the copied tile below the 3D Text2 tile still within the While tile loop
- Drag the variable guess tile and place on top of <None>

### **Congratulate the User for the Correct Answer**

- When you guess correctly, both character objects should tell the user he or she is correct and react, such as with a dance. This can be done using a Do together tile from the bottom and then programming the objects to say and do what you’d like

### **Your Turn:**

Can you program Alice to do the rock, paper, scissors game (also called roshambo)?

### **Game Play**

In rock, paper, scissors the objective is to select an object which defeats that of the opponent. Objects are resolved as follows:

- rock defeats scissors
- scissors defeats paper
- paper defeats rock

If both players choose the same object, the game is tied and the players throw again.

# Sample Alice Code Created by Lisa Perez

## world

### Events

When the world starts

Do: world.my first method

### Methods

```
world.my first method ( )
pick = 0 , count = 0 , guess = 0
// Lisa Perez
// June 19, 2012
// My First Game Program
// This program plays a guess the number game
pick set value to ( random number minimum = 1 maximum = 100 integerOnly = true )
guess set value to ( ask user for a number question = Enter a Number: )
While ( pick != guess )
  If ( pick < guess )
    rabbit say Your guess is too high
  Else
    penguin say Your guess is too low
  count set value to ( ( count + 1 ) )
  3D Text2 set text to ( count as a string )
  guess set value to ( ask user for a number question = Enter a Number: )
Do together
  penguin say Congratulations! duration = 2 seconds
  penguin turn at speed forward speed = 1 revolutions per second
  rabbit say You guessed correct! duration = 2 seconds fontSize = count
  rabbit roll at speed left speed = 2 revolutions per second
```

You can find these handouts and other Kids College Computer Game Programming information by visiting [www.lperezonline.com/kidscollege](http://www.lperezonline.com/kidscollege). Hope you enjoyed the class!