Your Course Syllabus

CODDY - International Coding and Design School for Teens and Kids

Swift Playgrounds: first steps in IOS development Course. Module 1

Learning goals are to gain basic programming skills in Swift, study programming approaches to problem solving, to develop programmer's mindset.

Course Syllabus:

Day one

Introduction to Swift commands

− Getting to know the group, the course program;
− Getting to know the history and advantages of the Swift language;
− Getting to know the Swift Playgrounds platform;
− Learning the concept of a command;
− Getting to know the terms bug and debugging;
− Developing skills for finding and fixing errors in code.

Lesson outcome: got to know the history of the Swift language, learned the concepts of "command", "bug", "debugging".
Practical task: solve yourself the "Shortest Route" task.

Day two

Function without parameters

− Introduction to the basic syntax of functions;
− Introduction to the concept of "decomposition";
− Repeating patterns;
− Acquiring the skill of searching for repeating patterns and decomposition;
− Introduction to the principle of single responsibility.

Lesson outcome: familiarized with simple functions, trained the skills of searching for repeating patterns and decomposition.
Practical task: solve yourself the "Treasure Hunt" task.

Day three

Cyclic operations: For loop

− Basic principles of For loops;
− Introduction to the concept of iteration;
− Development of the skill of searching for repeating patterns;
− Development of the skill of decomposition.

Lesson outcome: got acquainted with loops using the example of the For loop.
Practical task: solve yourself the "Four Stash Sweep" task.

Day four

Conditional code execution

− if, else-if, else constructions;
− Using conditional code inside a for loop;
− Developing the skill of finding a repeating pattern for executing conditional code;
− Creating "smart" functions that use conditional code.

Lesson outcome: learned the principles of the if-else construction.
Practical task: solve yourself the "Decision Tree" task.

Your Course Syllabus

CODDY - International Coding and Design School for Teens and Kids

Swift Playgrounds: first steps in IOS development Course. Module 2

Learning goals are to gain basic programming skills in Swift, study programming approaches to problem solving, to develop programmer's mindset.

Course Syllabus:

Day one

Logical operators

− Types of logical operators in Swift and their application in conditions;
− Logical operators AND, OR, NOT;
− Application of logical operators to determine the character's route.

Lesson outcome: studied logical operators and applied them in conditions.
Practical task: solve yourself the "Logical Labyrinth" task.

Day two

While Loop

− What is a while loop?
− Key features of using a while loop compared to a for loop;
− Loop within a loop. final and intermediate goals;
− Finding patterns when building a character's route;
− Using logical operators in a while loop condition.

Lesson outcome: learned another type of loop, learned how to place one intermediate task inside another.
Practical task: solve yourself the "You're Always Right" task.

Day three

Search for an algorithm for character navigation. Part 1

− Simple rules for character navigation based on the environment;
− Building logic based on the "right hand" rule;
− Character navigation using the while loop.

Lesson outcome: learned the principle of finding the next move based on the obstacle on the right.
Practical task: solve yourself the "Conquering a Maze" task.

Day four

Search for an algorithm for character navigation. Part 2

− Improving the algorithm based on new patterns;
− A loop within a loop using a complex algorithm;
− Search for a solution based on the most effective approach.

Lesson outcome: studied the principle of finding a move based on patterns.
Practical task: solve yourself the "Roll Right, Roll Left" task.

Your Course Syllabus

CODDY - International Coding and Design School for Teens and Kids

Swift Playgrounds: first steps in IOS development Course. Module 3

Learning goals are to gain basic programming skills in Swift, study programming approaches to problem solving, to develop programmer's mindset.

Course Syllabus:

Day one

Variables in Swift

− What is a variable;
− Using variables to store numbers;
− Variable as a counter;
− Using a counter as a tool to end the game;
− Using a counter as a condition with logical operators.

Lesson outcome: got acquainted with the concept of "variable", learned to use them as a counter to achieve goals.
Practical task: solve yourself the "Collect the Total" task.

Day two

Types and objects

− Type as a blueprint of a possible object;
− Properties and methods of a type;
− Accessing properties and methods of objects;
− Managing portal properties;
− Automating a route using variables.

Lesson outcome: familiarized with the basic features of types, learned how to use and change their properties.
Practical task: solve yourself the "Random Gems Everywhere" task.

Day three

Initialization of instances of a type

− Basic concept of initialization;
− Using methods of objects of a type;
− Using multiple characters;
− What is a constant and how does it differ from a variable.

Lesson outcome: learned the basic concept of initialization of an object and calling its methods.
Practical task: solve yourself the "It Takes Two" task.

Day four

Parameters in functions

− Why it is necessary to use parameters in functions;
− Creating and using a function with two parameters;
− Using parameters in functions to control the length of a path;
− Using methods with parameters to position a character at specified coordinates.

Lesson outcome: learned how to use parameters in methods and functions.
Practical task: solve yourself the "Twin Peaks" task.

Your Course Syllabus

CODDY - International Coding and Design School for Teens and Kids

Swift Playgrounds: first steps in IOS development Course. Module 4

Learning goals are to gain basic programming skills in Swift, study programming approaches to problem solving, to develop programmer's mindset.

Course Syllabus:

Day one

Building a game world. Part 1

− Initializing game world objects;
− Placing world objects on the scene using coordinates;
− Moving and activating objects to solve problems.

Lesson outcome: learned to initialize game world objects and place them at specified coordinates.
Practical task: solve yourself the "Making Your Own Portals" task.

Day two

Building a game world. Part 2

− Building a navigation algorithm when interacting with a portal;
− Building a navigation algorithm when there is no passage;
− Finding differences for correct world building and navigation;
− Completing the game world to determine the navigation algorithm.

Lesson outcome: training in finding differences and patterns.
Practical task: solve yourself the "A Puzzle of Your Own" task.

Day three

Arrays. Part 1

− The concept of an array;
− The structure of an array, element index;
− Accessing array elements;
− Deleting array elements;
− Inserting array elements.

Lesson outcome: familiarized with the basic capabilities of arrays.
Practical task: solve yourself the "Appending to an Array" task.

Day four

Arrays. Part 2

− Iterating over array elements using the for loop;
− Placing an element into an array while deleting it from another array;
− Finding errors related to using an incorrect index;
− Practicing the skills of parsing someone else's code and finding errors in it.

Lesson outcome: learned to iterate over arrays using the for loop and other approaches.
Practical task: solve yourself the "World Creation" task.

Your Course Syllabus

CODDY - International Coding and Design School for Teens and Kids

Swift Playgrounds: first steps in IOS development Course. Module 5

Learning goals are to gain basic programming skills in Swift, study programming approaches to problem solving, to develop programmer's mindset.

Course Syllabus:

Day one

Coordinates

− The concept of the coordinate axis using the example of the Blu game world;
− Placing a graphic element at specified coordinates;
− Placing a text element at specified coordinates;
− Placing an array of objects at specified coordinates.

Lesson outcome: became familiar with the coordinate axis and methods for placing objects in the Blu game world.
Practical task: solve yourself the "Elliptical Orbits" task.

Day two

Processing events by tap

− Tap events and their processing;
− Transferring tap events to a function;
− Placing objects on the screen at the tap point;
− Getting a random number in a given range.

Lesson outcome: learned how to place graphic objects by tap coordinates.
Practical task: solve yourself the "My Own Project" task.

Day three

Interception of events

− Using sounds when tapping on an object;
− Using a toolbar to select an object of action;
− Using animation of graphic rotation;
− Speaking graphic objects with text using Siri.

Lesson outcome: learned to use sounds when interacting with objects.
Practical task: solve yourself the "My Own Project" task.

Day four

Final

− Moving and animating objects when tapping;
− Animated removal of objects when tapping.
− Preparing for the presentation and demonstrating your project.

Lesson outcome: completed several practical tasks that trained the skills acquired in the course, presented your project.
Practical task: completing the task "My Own Project", demonstrate the results of your course work.