Piscine Swift - Day 05

Tools & Music

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Summary: This document contains the subject for Day for the “Piscine Swift” from 42

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Chapter I

Foreword

Here is a timeline of technological innovations that influenced the creation of music from Wikipedia’s Timeline of music technology

1951 : Pultec introduces the first passive program equalizer, the EQP-1
1952 : Harry F. Olson and Herbert Belar invent the RCA Synthesizer
1952 : Osmand Kendal develops the Composer-Tron for the Canadian branch of the Marconi Wireless Company
1955 : Ampex develops “Sel-Sync” (Selective Synchronous Recording), making audio overdubbing practical
1956 : Les Paul makes the first 8-track recordings using the “sel-sync” method
1956 : Raymond Scott develops the Clavivox
1958 : First commercial stereo disk recordings produced by Audio Fidelity
1958 : Evgeny Murzin along with several colleagues create the ANS synthesizer
1958 : At Texas Instruments, Jack Kilby creates the first integrated circuit
1959 : Daphne Oram develops a programming technique known as Oramics
1959 : Wurlitzer manufactures The Sideman, the first commercial electro-mechanical drum machine
1963 : Keio Electronics (later Korg) produces the DA-20, an early drum machine
1963 : The Mellotron starts to be manufactured in London
1963 : Phillips introduces the Compact Cassette tape format
1963 : Paul Ketoff designs the SynKet
1964 : Ikutaro Kakehashi debuts Ace Tone R-1 Rhythm Ace, the first electronic drum
1964 : The Moog synthesizer is released
1965 : Nippon Columbia patents an early electronic drum machine
1966 : Korg releases Donca-Matic DE-20, an early electronic drum machine
1967 : Ace Tone releases FR-1 Rhythm Ace, the first electronic drum machine to enter popular music
1967 : First PCM recorder developed by NHK
1968 : Sharp engineer Tadashi Sasaki conceives single-chip microprocessor
1968 : Release of Shin-ei's Uni-Vibe, designed by Fumio Mieda, an effects pedal with phase shift and chorus effects
1968 : King Tubby pioneers dub music, an early form of popular electronic music
1969 : Matsushita engineer Shuichi Obata invents first direct-drive turntable, Technics SP-10
1970 : ARP 2600 is manufactured
1971 : Busicom's Masatoshi Shima and Intel's Federico Faggin complete 4004, the first commercial microprocessor
1972 : Sord Computer Corporation develop Sord SMP80/08, an early microcomputer
1973 : Yamaha release Yamaha GX-1, the first polyphonic synthesizer
1974 : Yamaha build first digital synthesizer
1976 : Boss, a Roland subsidiary, release Boss CE-1 Chorus Ensemble, the first chorus pedal

1977 : Roland release MC-8 Microcomposer, an early microprocessor-driven CV/Gate digital sequencer
1977 : Apple founder Steve Jobs introduces Apple II, an early home computer
1977 : Sord Computer Corporation introduces Sord M200, an early home computer
1977 : Panafacom releases the Lkit-16, an early 16-bit microcomputer
1978 : Roland releases CR-78, the first microprocessor-driven drum machine
1979 : Casio releases VL-1,[26] the first commercial digital synthesizer
1980 : Fujio Masuoka invents flash memory at Toshiba
1980 : Roland releases TR-808, the most widely used drum machine in popular music
1980 : Roland introduces DCB protocol and DIN interface with TR-808
1980 : Yamaha releases GS-1, the first FM digital synthesizer
1980 : Kazuo Morioka creates Firstman SQ-01, the first bass synthesizer with a music sequencer
1981 : Roland releases TB-303, a bass synthesizer that lays the foundations for acid house music
1981 : Roland founder Ikutaro Kakehashi conceives MIDI
1981 : Toshiba's LMD-649, the first PCM digital sampler, introduced with Yellow Magic Orchestra's Technodelic
1981 : IBM introduces the IBM PC, a 16-bit personal computer
1982 : Sony and Philips introduce compact disc
1982 : First MIDI synthesizers released, Roland Jupiter-6 and Prophet 600
1983 : Introduction of MIDI, unveiled by Roland's Ikutaro Kakehashi and Sequential Circuits' Dave Smith
1983 : Roland releases MSQ-700, the first MIDI sequencer
1983 : Roland releases TR-909, the first MIDI drum machine
1983 : Roland releases MC-202, the first groovebox
1983 : Yamaha releases DX7, the first commercially successful digital synthesizer
1984 : Apple markets the Macintosh computer
1985 : Atari releases the Atari ST computer, designed by Shiraz Shivji
1985 : Akai releases the Akai S612, a digital sampler
1986 : The first digital consoles appear
1987 : Digidesign markets Sound Tools
1988 : Akai introduces the Music Production Controller (MPC) series of digital samplers
1994 : Yamaha unveils the ProMix 01

Chapter II

General Instructions

- Only this document will serve as reference. Do not trust rumors.
- Read carefully the whole subject before beginning.
- Watch out! This document could potentially change up to an hour before submission.
- This project will be corrected by humans only.
- This course is designed to build on previous days' concepts, try your hardest to finish everyday.
- Each day culminates in a portfolio piece, if you finish the day this is something you can use to get hired.
- When submitting, submit the folder of the Xcode project.
- Only the work submitted on the repository will be accounted for during peer-2-peer correction.
- Here it is the official manual of Swift and the Swift Standard Library
- It is forbidden to use other libraries, packages, pods, etc. Unless otherwise stated in the project.
- Got a question? Ask your peer on the right. Otherwise, try your peer on the left.
- You can discuss on the Piscine forum of your Intra!
- By Odin, by Thor! Use your brain!!!

Chapter III

Introduction

Today we are learning some other practical tools to be used alongside swift, namely dependency injection, the foundations of firebase and how to use tools that other people have made. We will explore this by playing with music, and making a simple piano app.

Chapter IV

Exercise 00 : CocoaPods

Exercise : 00
CocoaPods
Files to turn in: .xcodeproj and all necessary files
Allowed functions : Swift Standard Library, UIKit, MusicTheory Pod
Notes : n/a

CocoaPods is about dependencies. We are going to learn how to use dependency injection for CocoaPods. We are going to use a MusicTheory pod - https://cocoapods.org/pods/MusicTheory. We will use that to build a sequencer, which will play a loop of notes.

Chapter V

Exercise 01 : CocoaPods 2 - Making Your Own

Exercise : 01
CocoaPods 2 - Making Your Own
Files to turn in: .xcodeproj and all necessary files
Allowed functions : Swift Standard Library, UIKit, Firebase Framework SDK
Notes : n/a

We will create a default template of a file to use in all future projects. You will need to set up both a podspec and a LICENSE. For now we will only add what we need to add firebase functionality (useful in future days of the piscine). You will need analytics, a firebase header, module map and firebase configuration.

Chapter VI

Exercise 02: Playing With Sounds

Exercise : 02
Playing With Sounds
Files to turn in: .xcodeproj and all necessary files
Allowed functions : Swift Standard Library, UIKit, AudioKit
Notes : n/a

We are going to use AudioKit to implement sounds. This assignment will be considered complete if we have two buttons that play two unique sounds. We are also building what’s called an arpeggiator which plays a sequence of notes according to sequential parameters.

Chapter VII

Exercise 03: Save To Device

Exercise : 03
Save To Device
Files to turn in: .xcodeproj and all necessary files
Allowed functions : Swift Standard Library, UIKit, AVCaptureAudioDataOutput, AVCaptureOutput, AVCaptureAudioFileOutput
Notes : n/a

So now that we have at least two sounds we want to be able to record what we create. We need to be able to start, stop and pause recording of audio. This output audio needs to be saved to the local storage of the device where it can be played at a later time.

Hint: AVFoundation

Chapter VIII

Exercise 04: Simple Piano

Exercise : 04
Simple Piano
Files to turn in: .xcodeproj and all necessary files
Allowed functions : Swift Standard Library, UIKit
Notes : n/a

Now we pull it all together to build a portfolio piece. We will build a simple piano, that has multiple keys, options for tones, and the ability to record and save to disk.

Chapter XI

Bonus : Additional Functionality

Bonus
Additional Functionality
Files to turn in: .xcodeproj and all necessary files
Allowed functions : Swift Standard Library, UIKit
Notes : n/a

Add new functionality, maybe have the piano play different instruments, maybe implement an oscillator. Make it interesting.