

## Introduction

More than one task at same time is concurrency  
iPads and iPhones are dual core since 2011

To keep user interface responsive we need concurrency

Structuring apps (thread safety) we use concurrency(GCD and operation)

GCD-Simple tasks (functions)

Operation - Complex tasks(Objects is encapsulated)

Task run on threads, UI on main thread, other on created threads (User created)

//\*\*\*\*\*

GCD(Grand Central Dispatch) and operation works with queue instead of managing threads directly. Use system queues instead of creating own.Group related task into dispatch groups or operation queues. System manages total threads needed to complete the tasks

## Concurrency Problems

-Race condition (depends on timings between the thread on accessing resources)

Xcode8 Introduced thread sanitiser tool TSAN to find potential race condition in code. Serial queue is solution (Traditional was lock on resources, which can cause deadlock)

-Priority Inversion

GCD and operation can solve by promoting low priority task same as high priority task

-Deadlock

Two thread waiting for either to release the resource  
Serial queues my solve the deadlock