# [Unit 1: Kotlin basics](https://developer.android.com/courses/android-basics-kotlin/unit-1)

## Introduction to Kotlin

1. What is a program?

A specific task

A tool that helps you write Kotlin code

**A series of instructions that a computer system executes to accomplish some action**

A defined set of instructions that tells your computer to print “Happy Birthday!”

1. Which keyword do you use to define a function in Kotlin?

**fun**

func

function

newFunction

main

1. Which of the following do you need to create a Kotlin program that prints a line of text?

*Choose as many answers as you see fit.*

comment describing what your program does

**a main() function**

**curly braces {} around the instructions to the system**

**a call to print() or println()**

a repeat() statement

1. What do you expect this Kotlin code to do?

fun main(args: Array<String>) {  
  println("Hello, world!")  
  println("It's a sunny and warm day!")  
}

Print one line of text

**Print two lines of text**

Print three lines of text

Print two lines of text separated by a blank line

1. How would you modify this main() function so that it prints a 6-layer cake for someone's 4th birthday?

fun main() {  
  val age = 24  
  val layers = 5  
  printCakeCandles(age)  
  printCakeTop(age)  
  printCakeBottom(age, layers)  
}

Set val age to 6, set val layers to 4

Set val age to "4", set val layers to "6"

**Set val age to 4, set val layers to 6**

Leave the code as-is

1. Which of these options correctly calls the function, below, and passes it valid input arguments?

fun createMessage(name: String, location: String, age: Int) {  
  println("My name is ${name}. I am from ${location}, and I am ${age} years old.")  
}

**createMessage("Amy", "Australia", 20)**

createMessage("Evan", England, 9)

createmessage("Tom", "Thailand", “40”)

createMessage(Heather, “Haiti”, 7)

## [Create your first app](https://developer.android.com/courses/pathways/android-basics-kotlin-two)

1. What does IDE stand for?

**Integrated Development Environment**

Independent Design Environment

Ideal Developer Environment

Intelligent Design Environment

1. Which of the following are advantages of using Android Studio?

*Choose as many answers as you see fit.*

**It can help prevent typos and other mistakes in your code.**

**It comes with a virtual device called an emulator that can run your app.**

**It can show you a real-time preview of how your app will look on-screen while you code.**

It can automatically translate your app into other languages.

1. What does “Minimum SDK” refer to in an Android Studio project?

The minimum amount of storage that your app requires for download

The minimum number of devices that your app can access

The minimum download speed that your app requires

**The minimum version of Android that your app can run on**

1. What is the purpose of using a virtual device, or emulator, in Android Studio?

To show a variety of error messages to users

To experiment with app code safely

**To test your app on a device without having that physical device**

To see what your app looks like in a web browser

1. In Android Studio, what is a project template good for?

*Choose as many answers as you see fit.*

It causes Android Studio to download files faster.

**It makes getting started on building a new app faster.**

**It provides a structure that follows best practices.**

It is the only way to build apps that can be previewed in Android Studio.

**It makes building a new app less error-prone by pre-populating the project with some app code.**

1. How do you create a new project in Android Studio?

A. Log out of Android Studio, and navigate to your project folder to find instructions.

B. If you have a project already open, select File > New > New Project from the Android Studio menu.

C. In the “Welcome to Android Studio” window, click “Start a new Android Studio project.”

D. Create a new file on your computer, and title it “New Android Studio Project."

**Both B and C are ways to create a new project in Android Studio.**

None of the above

## [Build a basic layout](https://developer.android.com/courses/pathways/android-basics-kotlin-three)

1. Which of the following elements is considered a View in an Android app?

An image

A clickable button

Text on the screen

**All of the above**

None of the above

1. What is the main purpose of a ViewGroup?

It groups together the most common views that developers use in Android apps.

**It serves as a container for View objects, and is responsible for arranging the View objects within it.**

It is required to make a view interactive as a way to group TextViews on a screen.

It is required to set colors and background images.

1. The ViewGroup that helps you arrange the views inside of it in a flexible way is called a \_\_\_.

ImageView

**ConstraintLayout**

TextView

1. Which of the following are Attributes in Android?

*Choose as many answers as you see fit.*

**text**

**textSize**

textUse

**textColor**

textContent

1. Fill-in-the-blanks

*Enter one or more words to complete the sentence.*

In Android, a graphic that can be drawn to the screen is generally referred to as a .

1. Which of the following is an example of a “constraint” that could be applied to a view in a ConstraintLayout ViewGroup in the Layout Editor?

*Choose as many answers as you see fit.*

**A view that must always be a minimum distance away from the edge of its container**

A view that must always be free of warning triangles

**A view that must always be to the right of another view**

**A view that must always be the topmost view inside a container**

A view that must always include a contentDescription attribute

1. What is the purpose of the activity\_main.xml file in the project you created?

It provides the theme settings for your app.

It lets your app users create their own custom views of the app.

It stores all the images your app will use.

**It describes the layout of view groups and views for a screen.**

1. Why should you use string resources instead of hard-coded strings in your apps?

*Choose as many answers as you see fit.*

**It makes your app easier to translate.**

It allows you to use longer strings in your app.

It allows you to apply special color attributes to your string.

**It allows you to reuse the same string in multiple places in your program.**

## [Add a button to an app](https://developer.android.com/courses/pathways/android-basics-kotlin-four)

1. Which of the following is an example of a class?

*Choose as many answers as you see fit.*

**A Car class that has a make and model, and that can be driven**

**A Flower class that has a scent**

**A Puppy class that has breed, weight and age, and that can bark**

**A ShoppingCart class that has a cart size and cart value, and that can hold items**

**A Song class that has lyrics**

None of these are examples of a class.

1. Which of the following is a difference between a class and an instance?

*Choose as many answers as you see fit.*

**You can think of a class as a blueprint and an instance as the actual “thing".**

**A class is like architectural plans for a bridge, and the Golden Gate bridge an instance of those plans.**

A class is for defining categories of "things", while instances are for defining their properties.

**You can create multiple instances from a class, but you can't create classes from instances.**

1. For each of the following types of information, select whether it should be part of a class or an instance.

*Each answer only matches one item.*

Information about properties shared by all "things" belonging to the class, such as number of sides, number of legs, or that it has a color.



The specifics about a property, such as the specific color of a “thing” that can have a color.



1. True or false? Every MainActivity class in Android must have a main() function.

True

**False**

1. Which of the following is NOT a way for creating a comment in Kotlin?

*Choose as many answers as you see fit.*

Add // at the beginning of or inside a line and anything after that // is considered a comment.

Put /\* or /\*\* to start a block comment, and end it with \*/.

**Use // to turn the rest of a function into a comment.**

**Use /\* to start a comment that is one line long.**

1. Which of the following statements about a conditional statement is true?

*Choose as many answers as you see fit.*

**A conditional statement is a way for you to set up a condition and ensure that code following it is only executed if that condition is met.**

A conditional statement does not require any keywords.

A conditional statement should only be used with integers as input.

**A conditional statement can be used within functions to return output based on conditions defined in that function.**

1. What is a good reason for you to add comments to your code?

To explain to yourself or others why the code is written a certain way.

To structure code, like chapter headings in books.

To point out some part of the code that is very important.

To explain to other developers how to use your code for their own programs.

**All of the above**

None of the above

1. Which of the following are Kotlin data types?

*Choose as many answers as you see fit.*

**IntRange**

Num

**Int**

**Boolean (true or false)**

1. Which of the following are valid keywords used in conditional statements in Kotlin?

*Choose as many answers as you see fit.*

**if, else**

if, then, stop

**when**

repeat, finish

# [Unit 2: Layouts](https://developer.android.com/courses/android-basics-kotlin/unit-2)

## [Get user input in an app: Part 1](https://developer.android.com/courses/pathways/android-basics-kotlin-unit-2-pathway-1)

1. Which of the following is true about class inheritance?

Class inheritance lets you reuse code and makes your program easier to maintain.

Properties and functions of the parent class(es) are available to the child class.

You can define additional properties and functions that are specific to subclasses.

You can override parent class members in subclasses.

**All of the above**

1. Which of the following are true about abstract classes?

*Choose as many answers as you see fit.*

**They can be extended by subclasses and implementations can be provided for abstract members of the class.**

They have an implementation for all of their properties and functions.

**They may have abstract properties or abstract functions.**

They can be instantiated.

**They are not fully implemented and cannot be instantiated.**

They need to be marked with the open keyword to be extended.

1. Fill-in-the-blanks

*Enter one or more words to complete the sentence.*

The  is called when you create an instance of a class.

1. How do you mark a property to be used only inside its current class?

Use the override keyword.

Use the val keyword.

**Use the private keyword.**

Use the closed keyword.

It is not possible to do this.

1. Select all answers that are true for this XML layout when displayed on the screen. (You can sketch this out on a piece of paper first, if that helps.)

<androidx.constraintlayout.widget.ConstraintLayout  
    android:layout\_width="match\_parent"  
    android:layout\_height="match\_parent">  
    <TextView  
        android:id="@+id/textViewA"  
        android:layout\_width="wrap\_content"  
        android:layout\_height="wrap\_content"  
        android:text="A"  
        app:layout\_constraintStart\_toStartOf="parent"  
        app:layout\_constraintTop\_toTopOf="parent" />  
    <TextView  
        android:id="@+id/textViewB"  
        android:layout\_width="wrap\_content"  
        android:layout\_height="wrap\_content"  
        android:text="B"  
        app:layout\_constraintEnd\_toEndOf="parent"  
        app:layout\_constraintTop\_toTopOf="parent" />  
</androidx.constraintlayout.widget.ConstraintLayout>

*Choose as many answers as you see fit.*

TextView A appears vertically stacked on top of TextView B.

**The starting edge of TextView A is aligned to the starting edge of the parent view.**

The starting edge of TextView B is aligned to the starting edge of the parent view.

TextView B is horizontally and vertically centered within the parent.

**The tops of TextView A and TextView B are aligned to top of the parent view.**

The width of TextView A matches the width of the parent ConstraintLayout.

## [Get user input in an app: Part 2](https://developer.android.com/courses/pathways/android-basics-kotlin-unit-2-pathway-2)

1. Which line(s) of XML code will produce an error?

1    <TextView  
2        android:layout\_width="wrap\_content"  
3        android:layout\_height"wrap\_content"  
4        android:padding="8dp"  
5        android:text="@string/title"  
6        android:textSize=18sp />

*Choose as many answers as you see fit.*

Line 1 - Missing closing tag > after <TextView.

**Line 3 - Missing = symbol after android:layout\_height attribute.**

Line 4 - The android:padding attribute does not exist for a TextView.

Line 5 - You should use @str/title to refer to a string resource.

**Line 6 - Missing quotations around the attribute value 18sp.**

1. Which of the following is true about Gradle?

*Choose as many answers as you see fit.*

**Gradle is an automated build system used by Android Studio to build your apps.**

**Gradle handles installing your app on a device.**

Your app’s build.gradle file is written in XML.

**You can configure Android-specific options for your project in your app’s build.gradle file.**

The gradle configuration for your project cannot change after you initially create the project.

1. Which of the following statements about app icons are true?

*Choose as many answers as you see fit.*

It is sufficient to provide a single bitmap image of your app icon in your project to make it appear high quality on a range of Android devices.

**mdpi, hdpi, xhdpi, xxhdpi, and xxxhdpi are density qualifiers for resource directories to indicate that these are resources to be used on devices with a specific screen density.**

**Adaptive icons are made up of a foreground and background layer, and an OEM mask will be applied on top of them.**

Vector drawables only work for a certain screen density and should not be scaled.

1. Which of the below steps are part of changing the color of your app theme?

*Choose as many answers as you see fit.*

**Modify the themes.xml (night) file.**

**Set the primary and secondary color theme attributes of your app theme.**

**Define the colors used in your app as color resources in the colors.xml file.**

Set the background color of your app in the activity's layout file.

Set the color attribute on all your UI components.

Change the name of your theme to your preferred color.

1. Why use the Material Components for Android library?

*Choose as many answers as you see fit.*

**It provides widgets that follow the Material Design guidelines such as text fields and switches.**

It makes your code compile faster.

**It provides default Material themes that you can use directly or extend and then customize.**

It automatically suggests ways for your app to look better.

**It helps you more quickly build beautiful user experiences.**

## [Display a scrollable list](https://developer.android.com/courses/pathways/android-basics-kotlin-unit-2-pathway-3)

1. Before running the below code, simpleList should be initialized as a \_\_\_ list.

println(simpleList)  
simpleList.add(-5)  
simpleList.remove(4)  
println(simpleList)

Int

scrollable

sorted

**mutable**

1. Which of the following statements are valid?

*Choose as many answers as you see fit.*

**val list = listOf(1, 2, 5)**

**val oddNumbers = mutableListOf("1", "9", "15")**

val listValues: MutableList<Boolean>

val fruits = list("apple", "banana", "pear")

**val words: List<String> = listOf("jump", "run", "skip")**

1. Why does a RecyclerView need an Adapter?

To adapt data to display on a specific device type

To create a new ViewGroup

To adapt data from a data source into JSON

**To create new ViewHolders and bind data to them**

1. Which of the following are advantages to using RecyclerView?

*Choose as many answers as you see fit.*

**RecyclerView comes with built-in layout managers.**

RecyclerView lets you use packages to organize your code.

**RecyclerView helps save processing time, which can help scrolling through a list smoother.**

**RecyclerView is designed to be efficient for lists by reusing views that have scrolled off the screen.**

RecyclerView automatically incorporates Material Design components.

1. Which of the following is true about packages?

*Choose as many answers as you see fit.*

**You can use packages to organize your code.**

**In order to use a class from another package, you have to explicitly import it in your code.**

The package name is usually structured from specific to general.

**It is good practice to use packages to group classes by functionality.**

1. What should you do to ensure that the correct type of resource ID is passed in to a constructor?

Use an Adapter to force the type.

Only use a stringResourceId or imageResourceId.

**Use resource annotations.**

Use a naming convention to pass the ID in the form R.<type>.

None of the above

1. Fill-in-the-blanks

*Enter one or more words to complete the sentence.*

In the below code, **num in numbers** should be written in the for loop, so that the output returned is the list of numbers 1 through 3, with each number printed on a new line.

val numbers = listOf(1, 2, 3)  
for (\_\_\_\_\_\_\_) {  
  println(num)  
}

# [Unit 3: Navigation](https://developer.android.com/courses/android-basics-kotlin/unit-3)

## [Navigate between screens](https://developer.android.com/courses/pathways/android-basics-kotlin-unit-3-pathway-1)

1. Which of the following is false about collections and higher order functions in Kotlin?

Lists, maps, and sets can all use higher order functions.

**Lists are unordered, while maps and sets are ordered data types.**

Like the elements in a set, the keys in a map must be unique. However, multiple keys can map to the same value.

Higher order functions such as map and filter can take lambda functions as parameters.

1. Given the following code, what is the result of oneWordCities[1]?

val cities = listOf("Jeddah", "Bengaluru", "Shenzhen", "Abu Dhabi", "Mountain View", "Tripoli", "Bengaluru", "Lima", "Mandalay", "Tripoli")  
val oneWordCities = cities.toSet().toList().filter { !it.contains(" ")}.sorted()

Tripoli

Abu Dhabi

**Jeddah**

Bengaluru

1. Fill-in-the-blanks

*Enter one or more words to complete the sentence.*

A(n)  is a piece of data passed between activities when launching an intent.

1. If you open an app, and then leave the app using the back button, in which order were the following activity lifecycle methods called?

onStart(), onCreate(), onDestroy(), onStop()

onDestroy(), onStart(), onCreate(), onStop()

**onCreate(), onStart(), onStop(), onDestroy()**

onStart(), onCreate(), onStop(), onDestroy()

1. Which activity lifecycle method would be called if a dialog appears onscreen, partially obscuring an activity?

**onPause() because the activity is still displayed, but no longer has focus.**

onStop() because the activity does not need to respond to user input while the dialog is onscreen.

onResume() because the activity needed to respond to user input to display the dialog.

onDestroy() because the activity does not need to exist so long as it doesn’t have focus.

1. Which of the following is true about the lifecycle of a single activity?

*Choose as many answers as you see fit.*

**onStart() can be called multiple times, while onCreate() can only be called once.**

onStop() can be called multiple times, while onPause() can only be called once.

onDestroy() is called when the app enters the background.

**onResume() is called when the activity gains focus.**

1. Which of the following is false about intents?

Both implicit and explicit intents allow your app to launch another activity.

Explicit intents require you to specify the class of the activity you want to show.

Intents are performed using the startActivity() method.

**An implicit intent always results in the system asking the user which app to open.**

1. An activity contains the following code in onCreate(). What will happen when this code is executed, if the intent property is null?

val message = intent.extras?.getString("message"  
).toString()

**The app will crash because it attempted to access the extras property on a null object.**

The app will crash because it attempted to access a null object.

The app will not crash because the extras property is accessed unsafely using ?.

The app will not crash because the extras property is accessed safely using ?.

1. Which of the following tasks can be performed in onCreate()?

*Choose as many answers as you see fit.*

**Configuring views, such as setting the layout manager of a recycler view.**

Determining the items to be shown in the options menu.

Setting the onClickListener for items in the options menu.

**Getting extras from the intent that launched the activity.**

1. In which method should you handle what happens when a button in the app bar is pressed?

onCreateOptionsMenu()

openOptionsMenu()

**onOptionsItemSelected()**

onPrepareOptionsMenu()

## [Introduction to the Navigation component](https://developer.android.com/courses/pathways/android-basics-kotlin-unit-3-pathway-2)

1. True or False: onCreateView() is only called once for a fragment’s entire lifecycle.

True

**False**

1. Which of the following is a benefit of using fragments?

Navigation between fragments allows for more sophisticated user interface patterns, such as tab bars.

Using multiple fragments within an activity allows for an adaptive layout across multiple screen sizes.

The same fragments can be reused across multiple activities.

**All of the above**

1. In the fragment lifecycle, which of the following tasks should be performed in onViewCreated()?

*Choose as many answers as you see fit.*

Inflating the layout

**Binding view objects to properties in your fragment**

Configuring the options menu

**Setting properties of individual views, such as a recycler view’s adapter**

1. In the fragment lifecycle, which of the following tasks should be performed in onCreateView()?

**Inflating the layout**

Binding view objects to properties in your fragment

Configuring the options menu

Setting properties of individual views, such as a recycler view’s adapter

1. Fill-in-the-blanks

*Enter one or more words to complete the sentence.*

The  **onSupportNavigateUp**() method needs to be overridden in the host activity to ensure your app’s fragment-based navigation responds to the app’s "Up" button.

1. Given the code for navigating between two fragments in a note-taking app, a list of books and a list of notes, which of the following is true about the navigation graph file?

val action = BooksListFragmentsDirections.actionBooksListToNotesList(bookIndex = index)  
holder.view.findNavController().navigate(action)

A: Both the books list and notes list are destinations.

B: The books list fragment has an argument called bookIndex.

C: There’s an action defined on the navigation graph that goes from the books list to the notes list.

D: A, B, and C are true.

**E: Only A and C are true.**

## [Architecture components](https://developer.android.com/courses/pathways/android-basics-kotlin-unit-3-pathway-3)

1. Which of the following are reasons to use a ViewModel?

*Choose as many answers as you see fit.*

**A ViewModel and its data can survive orientation changes in an Activity/Fragment.**

**A ViewModel allows you to separate code that updates the UI from code that doesn’t need to rely on the UI or its lifecycle.**

A ViewModel prevents your data from updating the UI automatically.

1. A ViewModel is destroyed after which of the following ?

always after onStop

always after onDestroy

**after onDestroy, if it not a configuration change**

1. True or False: You should execute time-consuming tasks and I/O requests in your Activity/Fragment.

True

**False**

1. Why should you initialize and store LiveData in your ViewModel instead of a UI Controller?

Both the ViewModel and LiveData are lifecycle aware.

To ensure that the LiveData isn’t destroyed when the UI Controller is destroyed.

To hide or separate implementation details making your app more flexible.

**All of the above**

1. Which of the following allows you to use observe for changes?

**a LiveData object**

any mutable object

any property in a ViewModel

any property in a ViewModel or LiveData object

1. True or False: It’s OK for a ViewModel to directly reference a View or LifecycleOwner class.

True

**False**

## [Advanced navigation app examples](https://developer.android.com/courses/pathways/android-basics-kotlin-unit-3-pathway-4)

1. True or False: You can use the same ViewModel for multiple Activities or Fragments to share data.

**True**

False

1. What is the correct way to access the shared view model using the Kotin property delegate approach?

val viewModel: OrderViewModel by viewModels()

**val viewModel: OrderViewModel by activityViewModels()**

val viewModel: OrderViewModel by sharedViewModels()

val viewModel: OrderViewModel by fragmentViewModels()

1. Fill-in-the-blanks

*Enter one or more words to complete the sentence.*

Use a LiveData  **Transformation** to return a different LiveData instance based on the value of another instance.

1. How can the apply function in Kotlin be used to configure an object?

It can directly apply the object.

**It can apply a set of assignments to the object.**

It can apply new instances from the object.

It is not recommended to use apply to configure an object.

1. Using a data binding layout expression, what’s the correct syntax for adding an attribute to the button in this layout in order to bind a click listener to it?

<Button  
    android:id="@+id/next\_button"  
    android:layout\_width="wrap\_content"  
    android:layout\_height="wrap\_content"  
    android:text="@string/next" />

android:onClick="@{detailFragment.next()}"

android:onClick="@{(Int) -> detailFragment()}"

android:click="@{() -> detailFragment.next()}"

**android:onClick="@{() -> detailFragment.next()}"**

## [Adaptive layouts](https://developer.android.com/courses/pathways/android-basics-kotlin-unit-3-pathway-5)

1. The \_\_\_ pattern includes a list of items and more content for the selected item.

list-expansion

data-detail

**list-detail**

Item-list

1. In most cases, the pane will only slide on small devices, such as phones, but is displayed side by side on tablets.

**True**

False

1. Compact width is typically defined as a screen width smaller than \_\_\_dp.

**600**

720

840

1200

1. Fill-in-the-blanks

*Enter one or more words to complete the sentence.*

Setting the android:  **layout\_weight** property determines how leftover space in a SlidingPaneLayout is distributed among child views.

1. In general, isSlideable will only be true on larger devices, where two layouts are shown side by side.

True

**False**

1. Fill-in-the-blanks

*Enter one or more words to complete the sentence.*

The  **handleOnBackPressed()** method of OnBackPressedCallback is used to handle the system back button when using a SlidingPaneLayout.

1. Which of the following are SlidingPaneLayout events?

*Choose as many answers as you see fit.*

**OnPanelOpened()**

OnPanelChanged()

**OnPanelClosed()**

**OnPanelSlide()**

# [Unit 4: Connect to the internet](https://developer.android.com/courses/android-basics-kotlin/unit-4)

## [Coroutines](https://developer.android.com/courses/pathways/android-basics-kotlin-unit-4-pathway-1)

1. Fill-in-the-blanks

*Enter one or more words to complete the sentence.*

The  thread, sometimes called the UI thread, is responsible for updating the screen in an Android app.

1. Which of the following are some of the pitfalls of directly using threads in your code?

*Choose as many answers as you see fit.*

**Race conditions**

**Inconsistent output**

**Unresponsive UI**

Thread is deprecated

1. Which statement below is true about coroutines?

Once started, a coroutine cannot be canceled.

A coroutine always runs on the main thread.

**A coroutine may or may not execute.**

Coroutines avoid the need to create new threads, by running every task on the same thread.

1. True or False: If a function already calls a suspend function, then it does not need to be marked as a suspend function itself.

True

**False**

1. Which of the following are suspend functions?.

*Choose as many answers as you see fit.*

async()

**The lambda passed into async()**

runBlocking()

**The lambda passed into runBlocking()**

1. Which statement below is false about async() and runBlocking()?

Both functions take a CoroutineScope (a suspend function) as a parameter.

**Both functions return a Deferred**

You'll typically not use runBlocking in Android app code.

When using async, you need to use await() to access the returned value.

1. True or False: In most apps, you would create coroutines using the global scope.

True

**False**

1. What is responsible for determining which thread is used behind the scenes by a coroutine?

CoroutineScope

**Dispatcher**

Job

GlobalScope

1. Fill-in-the-blanks

*Enter one or more words to complete the sentence.*

A  is similar to a promise or future in other languages and serves as a placeholder for a return value.

1. True or False: A Job is a cancelable unit of work performed by a coroutine.

**True**

False

## [Get data from the internet](https://developer.android.com/courses/pathways/android-basics-kotlin-unit-4-pathway-2)

1. Which of the following are required to load and display an image with coil?

*Choose as many answers as you see fit.*

A placeholder image

An error image

**The URL of the image**

**An ImageView**

1. Match the element of HTTP requests and responses to the correct term.

*Each answer only matches one item.*

Status Message



Status Code



HTTP Verb



Content-Type



1. Which of the following are characteristics of a RESTful service?

*Choose as many answers as you see fit.*

**Stateless**

JSON responses

**Client-server-architecture**

**Resources exposed as URIs**

1. Which of the following are needed to make a network request with Retrofit?

*Choose as many answers as you see fit.*

**Add the android.permission.INTERNET permission to the manifest**

**Include Retrofit Gradle dependency**

**Supply a base URL to the Retrofit.Builder object,**

Add coil library as a Gradle dependency.

1. Why do you declare DataProviderManager with the object keyword?

*Choose as many answers as you see fit.*

**To make this object a singleton**

A shared object provides a convenient way to store state

**You only need one instance of the object.**

DataProviderManager is an object and not a class.

1. Which of the following are true about grid layouts?

*Choose as many answers as you see fit.*

**By default, a grid layout scrolls vertically**

**A grid layout is ideal for lists that can be represented as icons or images**

A span is equal to the width of one row

You can reference the object by its type name, DataProviderManager.

1. In the URL https://google.com/search?q=android, /search is called the \_\_\_.

Host

**Path**

Query

Parameters

1. Which of the following are true about binding adapters?

*Choose as many answers as you see fit.*

A binding adapter only provides an alternate way to set a hardcoded value.

**Binding adapters allow you to implement custom logic for how layout attributes are assigned.**

The @BindingAdapter annotation requires the view as an argument

**@BindingAdapter methods process custom values that are provided to XML attributes.**

1. True or False: Retrofit creates the code required to make network requests based on a web service.

**True**

False

1. The Moshi library requires the following to successfully process JSON in Kotlin.

*Choose as many answers as you see fit.*

**A data class describing the structure of the JSON object.**

**KotlinJsonAdapterFactory() added to the Moshi.Builder object.**

**A MoshiConverterFactory added to the Retrofit.Builder object.**

All properties in the data class marked with the @JSON annotation.

# [Unit 5: Data persistence](https://developer.android.com/courses/android-basics-kotlin/unit-5)

## [Introduction to SQL, Room, and Flow](https://developer.android.com/courses/pathways/android-basics-kotlin-unit-5-pathway-1)

1. True or False: INSERT, UPDATE, and DELETE can be used to modify multiple rows in a data table.

**True**

False

1. Which of the following are true about the DISTINCT keyword?

*Choose as many answers as you see fit.*

**The DISTINCT keyword can be used in an aggregate function.**

The DISTINCT keyword can be used to determine all the unique values in a column.

**The DISTINCT keyword can only be used when selecting a single column.**

The DISTINCT keyword can be used as part of the WHERE clause.

1. Which order of clauses in a SELECT statement is correct?

WHERE, LIMIT, ORDER BY, GROUP BY

WHERE, LIMIT, GROUP BY, ORDER BY

WHERE, ORDER BY, GROUP BY, LIMIT

**WHERE, GROUP BY, ORDER BY, LIMIT**

1. True or False: The ORDER BY clause returns results in descending order by default.

True

**False**

1. Fill-in-the-blanks

*Enter one or more words to complete the sentence.*

SQL stands for . **Structured Query Language**

1. True or False: You can use the \* to select all columns in a data table

**True**

False

1. A primary key allows for:

*Choose as many answers as you see fit.*

**Databases to represent relationships between tables.**

**Rows in one table to reference rows in another table.**

Contents of individual rows in a table to be unique.

**A unique identifier for each row in a table.**

1. Fill-in-the-blanks

*Enter one or more words to complete the sentence.*

Room is an ORM Library. ORM stands for . **Object Relational Mapping**

1. Which of the following are true about ListAdapter?

*Choose as many answers as you see fit.*

A ListAdapter is not a RecyclerViewAdapter, and thus, cannot be used with a RecyclerView.

**Like a RecyclerViewAdapter, a ListAdapter uses a ViewHolder class.**

**ListAdapter makes use of DiffUtil.**

The implementation for areContentsTheSame() compares only the IDs between entities, whereas areItemsTheSame() compares all the properties.

1. Which of the following is false about using flow?

Returning a regular type, like a list, from a DAO function won't allow your app to respond to data changes.

Data returned as a flow can be processed using the collect() function.

**A flow can only be accessed from a coroutine.**

Flow is a Kotlin feature that returns multiple asynchronous computed values.

## [Use Room for data persistence](https://developer.android.com/courses/pathways/android-basics-kotlin-unit-5-pathway-2)

1. Which of the following is false about the @Query annotation?

The @Query annotation is used with a method in the DAO.

The @Query annotation corresponds to a SELECT query.

The @Query annotation can pass arguments into a SQL statement by preceding their name with a colon.

**The @Query annotation can only be used with a suspend function.**

1. Which of the following are true about the DAO?

*Choose as many answers as you see fit.*

**DAO functions use annotations like @Insert and @Update that correspond to an operation on the database.**

**DAO functions are typically called directly from a fragment.**

DAO functions can return a flow.

**Instances of DAO classes are referenced in the AppDatabase class.**

1. Why do you need to use the synchronized() function when creating the database?

*Choose as many answers as you see fit.*

synchronized() is used to avoid race conditions.

synchronized() ensures only one thread can enter the block of code at once.

**Doing so allows multiple copies of the database to be created.**

**Calling synchronized() allows this code to be safely accessed from multiple threads at once.**

1. Which of the following is false about the AppDatabase class?

AppDatabase is an abstract class that inherits from RoomDatabase.

**The AppDatabase holds a reference to the view models.**

The @Database annotation specifies the entities (tables) in the database.

The getDatabase() function can create a new database, pre-populated from a file.

1. The @Insert and @Delete annotations can be used without providing a SQL statement.

**True**

False

1. Which of the following is true about the ViewModel in an app using Room?

*Choose as many answers as you see fit.*

**The ViewModel interacts with the DAO.**

The ViewModel updates the UI on the main thread.

**The ViewModel exposes data from the database to your app's UI.**

The ViewModel is held by a reference in the AppDatabase class.

1. Fill-in-the-blanks

*Enter one or more words to complete the sentence.*

To handle conflicts when inserting into a database, you can pass an  **OnConflictStrategy**, such as IGNORE, to the @Insert annotation.

1. The ViewModel factory is a class that inherits from \_\_\_ and is responsible for creating instances of the ViewModel class.

ViewModelFactory

ViewModelFactory.Provider

**ViewModelProvider.Factory**

ViewModelProvider

1. True or False: In a Room app, the Application class allows other objects to access the AppDatabase class.

**True**

False

# [Unit 6: WorkManager](https://developer.android.com/courses/android-basics-kotlin/unit-6)

## [Schedule tasks with WorkManager](https://developer.android.com/courses/pathways/android-basics-kotlin-unit-6-pathway-1)

1. Which of the following is true about WorkManager

Tasks are typically chained, but not run in parallel.

**WorkManager is part of Android Jetpack and requires a Gradle dependency to use.**

WorkManager does not necessarily guarantee that a task will be executed.

WorkRequest is the name of the class responsible for scheduling and running tasks

1. Which of the following would not require WorkManager?

**Performing a GET request to a web service.**

Long running tasks such as downloading large amounts of data

Scheduling a task to repeat after a set interval.

Doing something while the app is in the background.

1. A Worker represents a task to be scheduled by WorkManager while a WorkRequest contains the actual code to be executed.

True

**False**

1. Making execution dependent on device state such as storage space and battery life are examples of

chaining

best practices

**constraints**

canceling tasks

1. Fill-in-the-blanks

*Enter one or more words to complete the sentence.*

For a single task, you'd create a OneTimeWorkRequest, whereas for a task that needs to repeat after a given interval, you'd create a . **PeriodicWorkRequest**

1. In a chain, the output of the last WorkRequest becomes the input for the next WorkRequest.

**True**

False

1. Fill-in-the-blanks

*Enter one or more words to complete the sentence.*

The () method is implemented by subclasses of the Worker class and defines the code to be executed by a WorkRequest.

1. Which of the following are true about unique work chains?

*Choose as many answers as you see fit.*

**An ExistingWorkPolicy is required to determine what happens to an in-progress task (kept, replaced, etc.)**

**Tags can be used to get the WorkInfo for the request.**

If no tag is specified, you can still ensure a task is unique by setting the WorkManager ID

**Unique work can be canceled using the cancelUniqueWork() method and providing the tag.**