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1. Define the following design principles: Singleton, Factory, Builder, Facade, Prototype
    a. Singleton: 1 and only one instance. This principle states that a class should only have one object but have global access. In order to follow the principle, access to the class has to be synchronized.
    b. Factory: Principle that states to create object based on abstract class or interfaces. This allows the creation of class with little to no hard code which make them easier to be reused and objects are made from abstract classes or implements interfaces.
    c. Builder: Design principle in which objects should be easily customizable. Instead of creating constructors of a class, the class should have setter methods that can easily make objects with the needed attributes.
    d. Facade: Design pattern with states to create a simple interface which interacts with more complex systems. Instead of having a client having to access multiple subsystems at one time, an interface should be implemented that allows the client to only access the subsystem that is needed. A system that makes it easy and efficient to interact with subsystems.
    e. Prototype: Design pattern that states to clone an object instead of creating a new object of a class when the need arises.
2. What are the differences in ART and Dalvik?
    a. Android Runtime (ART) is the current runtime environment of Android systems since being introduced in Android 4.4 and replacing Dalvik in Android 5.0. Dalvik is a Just-In-Time (JIT) compiler, which means only small sections of the DEX bytecode is being compiled upon start of the app and continues to compile more as the app progress. This uses less memory in RAM and space on the device. ART is an Ahead-of-Time compiler. Upon installation of an app onto the device, the DEX bytecode is translated and saved on the device. SInce execution runs natively, it is less on the CPU and battery, but apps uses up more space on the device.
3. What is the android manifest used for?
    a. Android manifest is a file that contains essential information about your app for the Android build tools, the Android operating system, and Google Play. Every app project must have a manifest. Without the manifest, the app's package name could not be declared, the components of the app, the permissions of the apps, and the hardware and software features of the app could also not be declared.
4. Define the difference in Runtime and Compile Time.
    a. Compile time refers to the time in which high level code is translated into machine code for execution by the cpu. After compilation, an app can then be executed. Runtime refers to the time an app is running and usable by the user.
5. How does each of the following units of measure for view work: sp, dp, px, pt, in, mm

    a. Sp: Scale-Independent Pixel
    b. Dp: Density Independent Pixel is dimension scaling based on the density of pixel of a device screen. High density screen will scale up while lower density screens will scale down.
    c. Px: Pixel is dimension scaling based the number pixel the phone has. This is not recommended due to the number of different size screens available.
    d. Pt: Point is a dimension based on 1/72 in the device screen.
    e. In: Inches is a dimension based on the size of the device
6. Describe what each section of the Android Platform arch. Details.
    a. The Linux Kernel is the base of the Android Platform. It is essential a strip down version of the base platform of a Linux computer. This layer controls the CPU, power management and all the drivers of Android OS.
    b. The next level is the Hardware Abstraction Layer. This layer contains all the hardware access interfaces such as bluetooth, camera, sensor, and all other hardware installed on the device.
    c. The next level is the Native C/C++ Libraries and Android Runtime. Many core systems components and services require the native libraries of C or C++ in order to function correctly. One component that needs these libraries is the Android Runtime. The Android Runtime is the compiler for Android which is a Ahead-Of-Time compiler. ART compiles the DEX bytecode of apps when downloaded and then loads the compiled code when app is started. ART replace Dalvix, which was Just-In-Time compiler that compiles a little of the code as the app is started and continues with Android 5.
    d. The next level is the JAVA API Framework. This level contains the feature set of Android that allows apps to be coded in JAVA. The JAVA API has includes the View System that allows to UI creation, resource manager which allows access to non-code resources, other managers, and content providers.
    e. The highest level is the System Apps. This is where all the apps are installed and where the Users interact with the Android system
7. What is reflection in JAVA?
    a. The ability to inspect and call classes, methods, attributes, and more during runtime of a program. The is allow the code to be written without having to know every little detail before compilation. At runtime, the app can create classes, call methods, and more when needed to support functions.
8. How does gradle work behind the scene.
    a. The gradle is what actually builds the UI that we see and interact with on Android devices. The gradle runs scripts and move files and connect our code with the Android SDK.