Task 1

## KU4 – Identify and explain different types of Services.

There are three types of Services, the first one is the foreground service which runs in the background such as a media application without the need of user input. These services include notifications which are especially important with this type of service. The reason that notifications are important is to allow a continuous interactivity with the user for the app’s state awareness. Finally, this service unlike the background type the output is noticed by the user. (Android, 2021)

The third one is the background Service which is not perceived such as an application service that encrypts its contents. The encryption process it not witnessed or manipulated by the user but nonetheless its running in the background. (Android, 2021)

Finally, there is the bound service, which is as the name depicts, it binds the application’s component with a service. This service allows for a component to communicate comparable to a server and a client environment. With this, the bound component or multiple components concurrently can transmit and receive data if the binding is intact. (Android, 2021)

# KU7 – Describe a mobile application use-case requiring the use of a web-based Services.

## a. Why web-based services are important to Mobile Applications.

Web-based services are essential to mobile applications in many aspects. These features include the advantage of allowing the communication between different hardware. A service includes a server that exposes an endpoint, which in turn allows multiple devices connected to a network to make a request and receive a response via REST or in the earlier days with SOAP in a format such as JSON or XML.

The fact that a service is available anytime with no geological restrictions as long a network is established, is by its own an important feature to any device. Another important factor is that services can be deployed not only from a particular location in an application since they are not restricted by a specific activity.

Finally, they have the advantage of minimizing the requirement of processing power and storage. Since the services render a process in a separate server, the resources of a mobile device can be optimised accordingly. (Dospinescu & Perca, 2013)

## b. Describe a mobile application (case – study) where web-based services (APIs) might be required.

In the case of material manufacturing hardware some situations either for comfort or safety, remote management API service could be ideal. For a machine such as a 3D printer that requires instructions and constant attention from a user an API in the middle could be a solution. A mobile application could be created and connected via an API to the hardware with external sensors such as temperature and cameras to allow for constant watch and sensor recordings.

## c. Identify a real online service which can be used in the scenario described in question 2b.

There are multiple of online services for 3D printing such as a web interface called “OctoPrint” which allows a user to connect a 3D printer to a network either local or the internet (Häußge, 2021). This interface introduces endpoints to allow for an external software to control the hardware (Häußge, 2021). A Mobile application called “OctoRemote for OctoPrint” (Google, 2021), makes use of this API to render information and remote connectivity to the user.

## AA2 – Use the Lifecycle of a background Service (part1)

### List and describe the Main call back method in Services.

The main call back function that a service calls before any function is the ‘onCreate’. This function initialises the preliminary setup of the service afterwards the binding or the on-start command could be called. (Android, 2021)

### b. Due to recent restrictions on Android to improve battery life, all Background work including periodic tasks should now be scheduled through the Job Scheduler.

##### Describe Job Scheduler

The Job Scheduler is an API that manages the execution of processes in an application’s ecosystem. It combines and executes jobs according to the priority of a process with a reduction in power consumption.

The scheduler ensures that the processes don’t clash or freeze and thus a smoother application is created. A ‘wakelock’ is issued by the API to make sure that a process is finished while keeping the system awake without the user’s interaction. Finally, jobs can run as per specified conditions programmed, such as every amount of time also the conditions can be linked together. (Android, 2020)

##### Describe Job Service

The Job Service Class handles and executes requests intercepted from the Job Scheduler. Each job is executed via a Handler in the main thread. In the class there are the ‘onStartJob’ and ‘onStopJob’ methods which are needed to specify the actions to take while starting and stopping a job. (Android, 2020)