PREREQUISITES
IBM CLOUD SERVICES

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Team ID	PNT2022TMID34030
Project Name	Project - IoT Smart Waste Management System For Metropolitan Cities

PYTHON:

Python is a computer programming language often used to build websites and software, automate tasks, and conduct data analysis. Python is a general-purpose language, meaning it can be used to create a variety of different programs and isn't specialized for any specific problems. Python adds new classes for data handling, optimizations for script compilation and garbage collection, and faster asynchronous I/O. the latest version of the language aimed at making complex tasks simple, is now in production release. Python has a simple syntax similar to the English language. Python has syntax that allows developers to write programs with fewer lines than some other programming languages. Python runs on an interpreter system, meaning that code can be executed as soon as it is written. This means that prototyping can be very quick.

IBM CLOUD:

IBM Cloud is the cloud for smarter business trusted by thousands of global enterprises. Learn how you can provide reliable and continuous security for your cloud environment.

Types: Full Stack Cloud Platform, Hybrid Cloud, Data and AI Capabilities

IBM also builds cloud environments for clients that are not necessarily on the Smart Cloud Platform. For example, features of the Smart Cloud platform—such as Tivoli management software or IBM Systems Director virtualization—can be integrated separately as part of a non-IBM cloud platform. The Smart Cloud platform consists solely of IBM hardware, software, services and practices.

IOT CLOUD PLATFORM:

An IoT cloud is a massive network that supports IoT devices and applications. This includes the underlying infrastructure, servers and storage, needed for real-time operations and processing. IoT works as part of a collaboration and is used to store IoT data. The Cloud is a centralised server containing computer resources that can be accessed whenever required. Cloud Computing is an easy travel method for the large data packages generated by the IoT through the Internet. An IoT platform is a set of components that allows developers to spread out the applications, remotely

collect data, secure connectivity, and execute sensor management. An IoT platform manages the connectivity of the devices and allows developers to build new mobile software applications.

IBM CLOUD:

IBM Cloud is a suite of cloud computing services from IBM that offers both platform as a service (PaaS) and infrastructure as a service (IaaS). IBM uses Red Hat OpenShift on IBM Cloud, the market-leading hybrid cloud container platform for hybrid solutions that enables you to build once and deploy anywhere. With IBM Cloud IaaS, organizations can deploy and access virtualized IT resources -- such as compute power, storage and networking -- over the internet. For compute, organizations can choose between bare-metal or virtual servers .With IBM Cloud PaaS -- which is based on the open source cloud platform Cloud Foundry -- developers can use IBM services to create, manage, run and deploy various types of applications for the public cloud, as well as for local or on-premises environments. IBM Cloud supports various programming languages, such as Java, Node.js, PHP and Python and extends to support other languages. IBM offers three deployment models for its cloud platform:

Public: A public cloud that provides access to virtual servers in a multi-tenant environment. An enterprise can choose to deploy its applications in one or multiple geographical regions.

Dedicated: A single-tenant private cloud that IBM hosts in one of its data centers. An enterprise can connect to the environment using a direct network connection or VPN, and IBM manages the platform.

IBM Cloud Private: A version of the IBM platform that an organization deploys as a private cloud in its own data center behind a firewall.

IBM NODERED:

IBM Node-RED is a flow-based programming tool, originally developed by IBM’s Emerging Technology Services team and now a part of the OpenJS Foundation.

IBM Node-RED consists of a Node.js based runtime that you point a web browser at to access the flow editor. Within the browser you create your application by dragging nodes from your palette into a workspace and start to wire them together. With a single click, the application is deployed back to the runtime where it is run.

The palette of nodes can be easily extended by installing new nodes created by the community and the flows you create can be easily shared as JSON files.

IBM IOT PLATFORM:

IBM Watson™ IoT Platform is a fully managed, cloud-hosted service that makes it simple to derive value from Internet of Things (IoT) devices.

Simply register and connect your device, be it a sensor, a gateway, or something else, to Watson IoT Platform and start sending data securely up to the cloud using the open, lightweight MQTT messaging protocol. You can set up and manage your devices using your online dashboard or our secure APIs, so that your apps can access and use your live and historical data.

NODE-RED:

Node-RED is a programming tool for wiring together hardware devices, APIs and online services in new and interesting ways. It provides a browser-based editor that makes it easy to wire together flows using the wide range of nodes in the palette that can be deployed to its runtime in a single-click. Node-RED is an open-source programming tool, for connecting hardware devices, APIs and online services creatively and easily. Primarily, it is a visual tool designed for the Internet of Things, but can also be used for other applications to very quickly assemble flows of various services. Node-red is a framework thought for an IoT solution. The framework is programmed using a graphical interface.

IBM CLOUDANT DB:

Cloudant is an IBM software product, which is primarily delivered as a cloud-based service. Cloudant is a non-relational, distributed database service of the same name. Cloudant is based on the Apache-backed CouchDB project and the open source BigCouch project.

Cloudant's service provides integrated data management, search, and analytics engine designed for web applications. Cloudant scales databases on the CouchDB framework and provides hosting, administrative tools, analytics and commercial support for CouchDB and BigCouch. Cloudant's distributed CouchDB service is used the same way as standalone CouchDB, with the added advantage of data being redundantly distributed over multiple machines.

Cloudant was acquired by IBM from the start-up company of the same name. The acquisition was announced on February 24, 2014.The acquisition was completed on March 4 of that year.

By March 31, 2018, Cloudant Shared Plan will be retired and migrated to IBM Cloud.[4]

A fully managed, distributed database optimized for heavy workloads and fast-growing web and mobile apps, IBM Cloudant is available as an IBM Cloud® service with a 99.99% SLA. Cloudant elastically scales throughput and storage, and its API and replication protocols are compatible with Apache CouchDB for hybrid or multicloud architectures.