CAP471 - CA1

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Q1. Create a google doc for the topic "Latest trends and technologies used in agriculture sectors of India"
Link:
https://docs.google.com/document/d/1nTl-y-snnpwYsxbh3PDDJR1pi_NX7tCY6AEVA1iLdCc/edit?usp=sharing

Q2. Create a Google sheet for the record of Employees Data (20 Employees), where you have to calculate bonus on salary column.
Link:
https://docs.google.com/spreadsheets/d/1p6k9gLZzpxhAEnL29vAaDfB5b7IvzdnmW_DK5IpzzHI/edit?usp=sharing

Formula used:

1. For assigning bonus:
   =IF(D2>50000,"30%",IF(D2>30000,"40%",IF(D2>15000,"50%","NA")))
2. For calculating bonus:
   =IF(D2>50000,30/100*D2,IF(D2>30000,40/100*D2,IF(D2>15000,50/100*D2,0)))
3. For calculating total salary:
   =SUM(D2,F2)

Latest Trend and Technologies used in agriculture

Agriculture is the art and science of cultivating the soil, growing crops and raising livestock. It includes the preparation of plant and animal products for people to use and their distribution to markets.

Today, farmers worldwide are adapting to the technical aids to improve their farming efficiencies and gain better yields. Lance Donny, the new technology agriculture leader, says that we need to increase crop production with scarce resources-land, water, and fertilizers. Some of the state-of-the-art farming tools and technologies are crop monitoring drones, livestock measuring sensors, farm management software, driverless tractors, and many more.

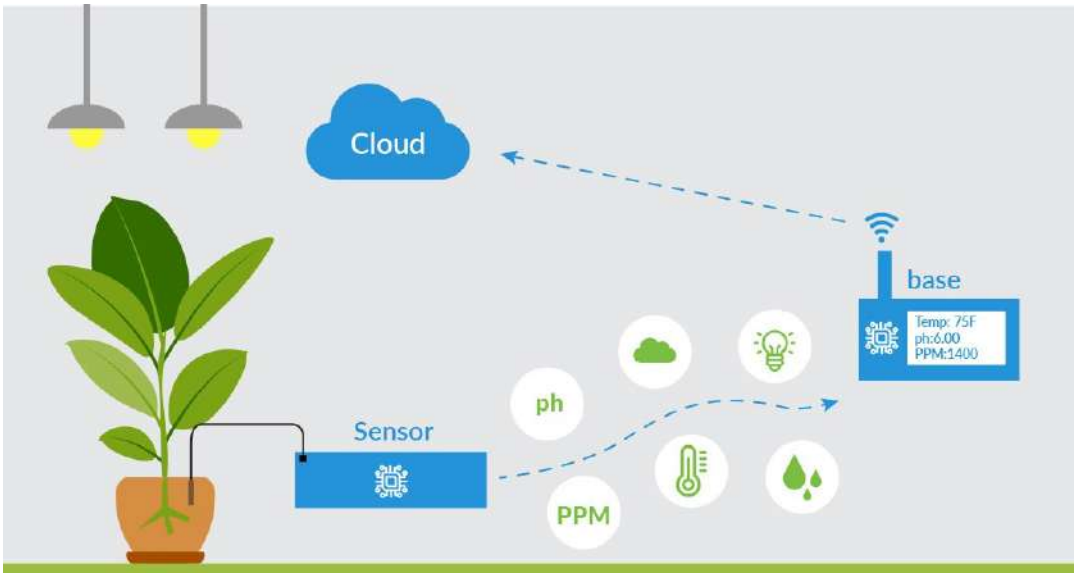
Technological advancements in the agriculture sector meet the growing demand for farm automation, digitalization, and sustainability. Emerging agriculture trends mark a shift towards smart farming and efficient utilization of time and resources while reducing crop losses. Smart farming is an upcoming concept that deploys technologies like the Internet of Things (IoT), computer vision, and artificial intelligence (AI) for farming. Robots and drones are replacing traditional farm operations such as picking fruits, killing weeds, or spraying water or fertilizer on crops. Imagery from drones and satellites, coupled with Global Positioning System (GPS) technology, provides a high-resolution and location-specific view of the field. Further, IoT devices, powered by sensor technology, collect real-time field data that allow farmers to make data-driven decisions. In addition, the widespread adoption of precision agriculture and indoor farming in recent years fuels IoT growth in farming. Taken together, these technological innovations generate disruptive and sustainable changes in agricultural practices. The focus is to not only improve the overall quality and quantity of crops and livestock but also to reach the ultimate goal of a sustainable future for all living things on earth.

Following are some latest trends and technologies that are used in agriculture:

1. **Internet of Things**

Monitoring of the crop field in conventional farming requires intensive labor, physical equipment, time, and effort. IoT technology provides an alternative to these traditional methods. An IoT device contains one or more sensors that collect data and provide accurate information via mobile applications or other means in real-time. These sensors perform countless activities, such as soil, temperature & humidity sensing, plant & livestock tracking, and more. It also facilitates remote monitoring of farms, providing greater convenience to farmers. Further, new irrigation systems utilize IoT sensors for automation of the delivery of water to crops. These constitute

evapotranspiration sensors, on-site soil moisture sensors, rain sensors, and several others.



Startups are developing innovative sensor solutions that combine IoT technology with drones, robots, and computer imaging to increase the agility, accuracy, and precision of farm processes. These send on-time alerts and improve the response time for areas that need attention.

2. **Agricultural Robotics**

Shortage of labor is a critical problem farmers face, and this is amplified in the case of large field operations. So, startups are manufacturing agricultural robots to assist farmers with numerous farm operations, including fruit-picking, harvesting, planting, transplanting, spraying, seeding, and weeding.

Farmers are increasingly relying on robots to automate repetitive tasks in the field. They deploy smart agricultural machines, such as GPS-enabled autonomous and semi-autonomous tractors for harvesting. Tractors also come with auto-steer technology for easier navigation across the field. Moreover, robots are used in automated systems in livestock management as well. This includes automated weighing scales, incubators, milking machines, auto feeders, and many more. Robots allow farmers to focus more on improving overall productivity, without having to worry about slow farm processes. They also prevent human-induced errors and provide convenience through automation.

3. **Artificial Intelligence**

Incorporating artificial intelligence in agriculture provides farmers with real-time insights from their field, allowing them to be proactive. AI offers predictive insights for forecasting weather data, crop yield, and prices, thereby helping farmers make informed decisions. Chatbots, like a farmers' Alexa, give suggestions and input recommendations to farmers.

AI and ML algorithms automate anomaly and disease recognition in plants and livestock. This allows timely detection and corrective response if required. Biotechnology also deploys ML algorithms for gene selection recommendations. Further, AI provides easy access to finance to creditors who are denied mainstream credit. Startups are exploiting AI in several ways to come up with innovative solutions that improve overall agricultural quality. For example, harvest quality vision (HQV) is a recent agritech innovation that scans and determines the quality and quantity of fruits and vegetables.

4. **Drones**

Increasing farm productivity while saving costs is challenging. But drones, also known as unmanned aerial vehicles (UAVs), help farmers overcome this hassle in an effective way. Drones collect raw data which translates into useful information for farm monitoring. Drones equipped with cameras facilitate aerial imaging and surveying of near and far-stretched fields. This data optimizes the application of fertilizers, water, seeds, and pesticides.

Moreover, drones along with GPS technology, are used for livestock tracking, geofencing, and grazing monitoring. They fly over fields to capture images that range from simple visible-light photographs to multispectral imagery which helps in the analysis of crop, soil, and field. One drawback is they are not fit for poultry monitoring, as birds tend to get frightened by their movement. However, for others, like cattle or livestock monitoring, grazing monitoring, and crop cultivation, they are a cost-effective and invaluable tool for farmers to survey their lands. Startups are also working on drones capable of measuring the chlorophyll level, weed pressure, mineral and chemical composition of soils.

5. **Blockchain**

Once the crops and produce are ready, farmers dive into the troubles of fair trading, selling, marketing, and proving the authenticity of their produce. Blockchain developer helps farmers ensure the safety of their crops, preventing theft and fraud, efficiently managing the supply chain, and balancing the food ecosystem.

The real-time use cases of Agriculture Blockchain technology are:

- Food Traceability
- Transparency in the food supply chain
- Agricultural insurance for farmers
- E-commerce for agro-trades
- Agricultural subsidies

Conclusion

Advancing in all the fulcrums of life is equitable development and growth for humanity. Imbibing technology in the agriculture sector is a but-obvious facet that you must consider for expanding your agro-enterprise.

Emp ID	Emp Name	Department	Salary	Bonus	Bonus Amount	Net Salary
293428	Apurwa	IT	18415	50%	9207.5	27622.5
121865	Amresh	Sales	14826	NA	0	14826
183291	Astuti	HR	19477	50%	9738.5	29215.5
151894	Shubham	IT	51489	30%	15446.7	66935.7
741091	Jasmeen	Sales	31013	40%	12405.2	43418.2
277863	Sirjanpreet	Sales	32355	40%	12942	45297
526491	Deepak	IT	57464	30%	17239.2	74703.2
226788	Maulik	Service	25556	50%	12778	38334
879090	Shivam	IT	12528	NA	0	12528
653102	Vishal	Sales	12492	NA	0	12492
343208	Irshad	HR	28813	50%	14406.5	43219.5
773129	Anchal	IT	36060	40%	14424	50484
238108	Ghulam	IT	57536	30%	17260.8	74796.8
385181	Afsar	Sales	47788	40%	19115.2	66903.2
348539	Santosh	Sales	33884	40%	13553.6	47437.6
647314	Abhay	Sales	28728	50%	14364	43092
481109	Saksham	IT	31894	40%	12757.6	44651.6
675449	Krishna	IT	36717	40%	14686.8	51403.8
517784	Shreyansh	Sales	20769	50%	10384.5	31153.5
705740	Akash	IT	47935	40%	19174	67109