1. Users Table

Table Schema

Column Name	Data Type	Description
UserId	`INT` (PK, IDENTITY)	Unique user ID (auto-incremented)
FullName	`NVARCHAR(100)`	User's full name
Email	`NVARCHAR(100)`	User's unique email
PasswordHash	`NVARCHAR(255)`	Secure hashed password
Role	`NVARCHAR(20)`	Role of the user: Farmer, Expert, Admin
Phone	`NVARCHAR(15)`	Optional phone number
Address	`NVARCHAR(255)`	Optional address
IsActive	`BIT`	Status: 1 = Active, 0 = Inactive
CreatedAt	`DATETIME2`	Timestamp when user was created
UpdatedAt	`DATETIME2`	Timestamp when user was last updated

Sample Inserted Records

UserId	FullName	Email	PasswordHash	Role	Phone	Address	IsActive	CreatedAt	UpdatedAt
1	John Farmer	john@example.com	hashed_password_123	Farmer	1234567890	123 Farm Road	1	2025-07-07 00:00:00	2025-07-07 00:00:00
2	Jane Expert	jane@example.com	hashed_password_456	Expert	0987654321	456 Expert Lane	1	2025-07-07 00:00:00	2025-07-07 00:00:00
3	Admin User	admin@example.com	hashed_password_789	Admin	1122334455	789 Admin Street	1	2025-07-07 00:00:00	2025-07-07 00:00:00
4	Ravi Singh	ravi.singh@example.com	hashed_pw_004	Farmer	9876543210	101 Green Valley	1	2025-07-07 00:00:00	2025-07-07 00:00:00
5	Anita Verma	anita.verma@example.com	hashed_pw_005	Expert	9876543211	102 Knowledge Blvd	1	2025-07-07 00:00:00	2025-07-07 00:00:00
6	Mohit Kumar	mohit.kumar@example.com	hashed_pw_006	Farmer	9876543212	103 Crop Street	1	2025-07-07 00:00:00	2025-07-07 00:00:00
7	Priya Das	priya.das@example.com	hashed_pw_007	Expert	9876543213	104 Smart Farm	1	2025-07-07 00:00:00	2025-07-07 00:00:00
8	Karan Patel	karan.patel@example.com	hashed_pw_008	Admin	9876543214	105 AgroTech HQ	1	2025-07-07 00:00:00	2025-07-07 00:00:00
9	Neha Sharma	neha.sharma@example.com	hashed_pw_009	Farmer	9876543215	106 Eco Farms	1	2025-07-07 00:00:00	2025-07-07 00:00:00
10	Deepak Roy	deepak.roy@example.com	hashed_pw_010	Expert	9876543216	107 Field Lane	1	2025-07-07 00:00:00	2025-07-07 00:00:00

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2. Farms Table

Table Schema

Column Name	Data Type	Description
FarmId	`INT` (PK, IDENTITY)	Unique farm ID
FarmName	`NVARCHAR(100)`	Name of the farm

Column Name	Data Type	Description
Location	NVARCHAR(255)	Physical address or locality of the farm
Latitude	DECIMAL(9,6)	GPS latitude (nullable)
Longitude	DECIMAL(9,6)	GPS longitude (nullable)
TotalAcres	DECIMAL(10,2)	Total area of the farm in acres
UserId	INT (FK)	Owner of the farm, references Users
IsActive	BIT	Active status (1 = active, 0 = inactive)
CreatedAt	DATETIME2	Timestamp of creation
UpdatedAt	DATETIME2	Timestamp of last update

Inserted Records

FarmId	FarmName	Location	Latitude	Longitude	TotalAcres	UserId
1	Green Horizon Farm	Village Alpha	25.317645	82.973914	12.50	1
2	Sunny Acres	Rural Zone 5	24.876541	85.007891	20.00	2
3	EcoGrow Estate	Farmbelt Region	23.789654	84.123456	15.75	1
4	Harvest Hill	Mountain Valley	22.456987	83.456789	18.30	2
5	Golden Fields	Riverbank Area	21.876512	82.987654	25.00	1
6	AgroBloom Farm	Western Patch	26.000123	81.654321	10.40	2
7	Sunrise Orchards	Foothill Plains	23.654987	80.456789	30.00	1
8	FreshSprout Fields	Irrigated Zone	22.111222	79.345678	16.90	2
9	NatureNest Farm	Delta District	24.234567	78.123456	14.60	1
10	PureHarvest Land	Hinterland South	25.345678	77.987654	19.85	2

3. Crops Table

Table Schema

Column Name	Data Type	Description
CropId	INT (PK, IDENTITY)	Unique crop ID
CropName	NVARCHAR(100)	Name of the crop
OptimalSoilpHMin	DECIMAL(4,2)	Minimum suitable soil pH for the crop (nullable)
OptimalSoilpHMax	DECIMAL(4,2)	Maximum suitable soil pH for the crop (nullable)
OptimalTempMin	DECIMAL(5,2)	Minimum temperature in °C (nullable)
OptimalTempMax	DECIMAL(5,2)	Maximum temperature in °C (nullable)
AvgWaterReqmm	DECIMAL(10,2)	Average water requirement in millimeters
GrowthDurationDays	INT	Number of days from sowing to harvest
SeedingDepthCm	DECIMAL(5,2)	Ideal seeding depth in centimeters (nullable)
HarvestSeason	NVARCHAR(20)	Typical harvest season (e.g., Summer, Fall)
Description	NVARCHAR(MAX)	Description or notes about the crop
IsActive	BIT	Active status (1 = active, 0 = inactive)
CreatedAt	DATETIME2	Timestamp of creation
UpdatedAt	DATETIME2	Timestamp of last update

Inserted Records

CropId	CropName	pH Min	Temp Min	Water mm	Duration	Depth cm	Season	Description
1	Wheat	6.0	15.0	450.00	120	2.5	Summer	Common wheat crop
2	Corn	5.8	20.0	600.00	90	3.0	Fall	Maize crop
3	Tomato	6.0	18.0	400.00	75	1.0	Summer	Tomato vegetable crop
4	Rice	5.5	20.0	1200.00	150	2.0	Summer	Rice grain crop
5	Barley	6.0	12.0	500.00	90	3.0	Fall	Barley cereal crop
6	Potato	5.5	10.0	600.00	80	4.0	Winter	Potato tuber crop
7	Onion	6.0	12.0	400.00	100	2.5	Year-round	Bulb vegetable
8	Soybean	6.0	20.0	500.00	100	3.0	Summer	Protein-rich legume
9	Peanut	5.5	25.0	400.00	120	4.0	Fall	Underground legume
10	Cabbage	6.0	10.0	350.00	75	1.5	Winter	Leafy vegetable crop

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4. Fields Table

Table Schema

Column Name	Data Type	Description
FieldId	`INT` (PK, IDENTITY)	Unique field ID
FieldName	`NVARCHAR(100)`	Name of the field
SizeAcres	`DECIMAL(10,2)`	Size of the field in acres
SoilType	`NVARCHAR(50)`	Type of soil (Loamy, Sandy, Clay, etc.)
IrrigationType	`NVARCHAR(30)`	Type of irrigation used
FarmId	`INT` (FK)	Reference to `Farms(FarmId)`
IsActive	`BIT`	1 = Active, 0 = Inactive
CreatedAt	`DATETIME2`	Record creation timestamp
UpdatedAt	`DATETIME2`	Last updated timestamp

Inserted Records

FieldId	FieldName	SizeAcres	SoilType	IrrigationType	FarmId
1	Field A1	2.50	Loamy	Drip	1
2	Field A2	3.75	Sandy	Sprinkler	1
3	Field A3	1.80	Clay	Flood	1
4	Field A4	4.25	Silty	Manual	1
5	Field A5	2.00	Peaty	Drip	1
6	Field B1	3.00	Loamy	Sprinkler	2
7	Field B2	2.70	Clay	Drip	2
8	Field B3	1.90	Sandy	Manual	2
9	Field B4	4.10	Silty	Flood	2
10	Field B5	3.25	Loamy	Drip	2

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5. Sensors Table

Table Schema

Column Name	Data Type	Description
SensorId	`INT` (PK, IDENTITY)	Unique sensor ID
SensorType	`NVARCHAR(50)`	Type of sensor (e.g., Temperature, Humidity)
Manufacturer	`NVARCHAR(100)`	Manufacturer of the sensor
Model	`NVARCHAR(100)`	Model number or code
SerialNumber	`NVARCHAR(100)`	Unique serial number
FieldId	`INT` (FK)	Reference to `Fields(FieldId)`
InstallationDate	`DATETIME2`	Date the sensor was installed
LastCalibrated	`DATETIME2`	Last calibration date
CalibrationInterval	`INT`	Days between calibrations
LatestValue	`DECIMAL(15,4)`	Most recent sensor reading
LatestUnit	`NVARCHAR(20)`	Unit of the latest reading (e.g., °C, %, Lux)
LatestQualityScore	`DECIMAL(3,2)`	Quality score of the latest reading (0 to 1)
LastReadingTime	`DATETIME2`	Timestamp of last reading
IsActive	`BIT`	1 = Active, 0 = Inactive
CreatedAt	`DATETIME2`	Record creation timestamp

Inserted Records

SensorId	SensorType	Manufacturer	Model	SerialNumber	FieldId	LatestValue	Unit	QualityScore	LastReadingTime
1	Temperature	AgroSense	T-100	SN-T100-001	1	27.5	°C	0.95	2025-07-07 10:00:00
2	Humidity	CropTech	H-200	SN-H200-002	2	68.2	%	0.89	2025-07-07 10:05:00
3	Soil_Moisture	FarmBotics	SM-300	SN-SM300-003	1	23.4	%	0.92	2025-07-07 09:50:00
4	pH	SoilCheck	PH-101	SN-PH101-004	3	6.8	pH	0.98	2025-07-07 08:40:00
5	Light	AgroSense	LUX-500	SN-LUX500-005	2	12000	Lux	0.93	2025-07-07 11:00:00
6	Pressure	AgroWeather	P-400	SN-P400-006	4	1013.25	hPa	0.90	2025-07-07 07:30:00
7	Wind	WindX	W-600	SN-W600-007	3	15.4	km/h	0.88	2025-07-07 08:10:00
8	Rain	RainMate	R-700	SN-R700-008	1	5.6	mm	0.85	2025-07-07 09:20:00
9	Humidity	CropTech	H-201	SN-H201-009	4	72.1	%	0.91	2025-07-07 10:45:00
10	Temperature	AgroSense	T-101	SN-T101-010	2	29.8	°C	0.94	2025-07-07 11:15:00

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6. SensorReadings Table

Table Schema

Column Name	Data Type	Description
ReadingId	`BIGINT` (PK, IDENTITY)	Unique sensor reading ID
SensorId	`INT` (FK)	Reference to `Sensors(SensorId)`
Value	`DECIMAL(15,4)`	Measured sensor value
Unit	`NVARCHAR(20)`	Unit of the reading (e.g., °C, %, pH, Lux)
QualityScore	`DECIMAL(3,2)`	Data quality score between 0 and 1
ReadingTime	`DATETIME2`	Timestamp when the reading was captured

Inserted Records

ReadingId	SensorId	Value	Unit	QualityScore	ReadingTime
1	1	27.4	°C	0.96	2025-07-07 10:10:00
2	2	67.9	%	0.88	2025-07-07 10:15:00
3	3	24.1	%	0.91	2025-07-07 10:20:00
4	4	6.9	pH	0.97	2025-07-07 10:25:00
5	5	11800.0	Lux	0.92	2025-07-07 10:30:00
6	6	1012.9	hPa	0.89	2025-07-07 10:35:00
7	7	14.8	km/h	0.87	2025-07-07 10:40:00
8	8	6.0	mm	0.86	2025-07-07 10:45:00
9	9	70.5	%	0.90	2025-07-07 10:50:00
10	10	28.9	°C	0.95	2025-07-07 10:55:00

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7. FieldWiseCrops Table

Table Schema

Column Name	Data Type	Description
FieldWiseCropId	`INT` (PK, IDENTITY)	Unique crop-planting record ID
FieldId	`INT` (FK)	Reference to `Fields(FieldId)`
CropId	`INT` (FK)	Reference to `Crops(CropId)`
PlantedDate	`DATE`	Date the crop was planted
ExpectedHarvestDate	`DATE`	Expected harvest date
ActualHarvestDate	`DATE`	Actual date of harvest (nullable if not harvested)
CurrentGrowthStage	`NVARCHAR(50)`	E.g., Seedling, Vegetative, Fruiting, Harvested
PlantedArea	`DECIMAL(10,2)`	Area of the field used for this crop (in acres)
Status	`NVARCHAR(20)`	Status of the crop: Active, Harvested, Failed, etc.
Notes	`NVARCHAR(MAX)`	Optional notes
CreatedAt	`DATETIME2`	Timestamp of creation
UpdatedAt	`DATETIME2`	Timestamp of last update

Inserted Records

FieldWiseCropId	FieldId	CropId	PlantedDate	ExpectedHarvestDate	ActualHarvestDate	GrowthStage	PlantedArea	Status	Notes
1	1	1	2025-03-15	2025-07-15	NULL	Vegetative	2.50	Active	Healthy crop growth observed.
2	2	2	2025-03-20	2025-06-20	NULL	Flowering	3.00	Active	Needs light irrigation.
3	1	3	2025-02-10	2025-05-15	2025-05-12	Harvested	2.80	Harvested	Yield slightly below average.
4	2	4	2025-01-05	2025-04-10	2025-04-09	Maturity	3.50	Harvested	Crop successfully harvested.

FieldWiseCropId	FieldId	CropId	PlantedDate	ExpectedHarvestDate	ActualHarvestDate	GrowthStage	PlantedArea	Status	Notes
5	1	5	2025-04-01	2025-08-01	NULL	Seedling	1.75	Active	Early stage - good progress.
6	2	1	2025-02-01	2025-06-01	2025-05-25	Harvested	2.90	Harvested	Above-average yield.
7	1	2	2025-03-10	2025-06-25	NULL	Fruiting	2.30	Active	Requires pest control.
8	2	3	2025-01-20	2025-05-20	NULL	Failed	3.10	Failed	Flooding caused crop loss.
9	1	4	2025-02-18	2025-06-20	NULL	Vegetative	2.70	Active	Leaf growth healthy.
10	2	5	2025-04-10	2025-08-15	NULL	Seedling	3.20	Active	Proper germination observed.

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8. SmartInsights Table

Table Schema

Column Name	Data Type	Description
InsightId	`INT` (PK, IDENTITY)	Unique identifier for the insight
InsightType	`NVARCHAR(50)`	Type of insight (e.g., Alert, Recommendation, Reminder, Tip)
Title	`NVARCHAR(200)`	Short descriptive title of the insight
Message	`NVARCHAR(MAX)`	Full detail or body of the insight
Priority	`NVARCHAR(20)`	Urgency level: High, Medium, Low
Status	`NVARCHAR(20)`	Status of insight: Active, Seen, Resolved
SourceType	`NVARCHAR(50)`	Origin type: Sensor, Field, Farm, Schedule, AI
SourceId	`INT`	Foreign key reference ID to the related entity (optional)
TargetUserId	`INT` (FK)	The user to whom the insight is addressed
ValidUntil	`DATETIME2`	Optional expiration timestamp for the insight
CreatedAt	`DATETIME2`	Timestamp when the insight was created (default: current time)
IsResolved	`BIT`	Whether the insight has been marked as resolved (`0 = no` , `1 = yes`)

Inserted Records

InsightId	InsightType	Title	SourceType	SourceId	TargetUserId	Priority	Status
1	Alert	Soil Moisture Low	Sensor	3	1	High	Active
2	Recommendation	Apply Potassium Fertilizer	Field	2	1	Medium	Active
3	Reminder	Upcoming Irrigation Task	Schedule	1	1	Low	Active
4	Tip	Use Organic Pest Control	Field	1	1	Low	Active
5	Recommendation	Switch to Drip Irrigation	Farm	1	1	High	Active
6	Alert	Rain Forecasted Tomorrow	Farm	1	1	High	Active
7	Recommendation	Rotate Crop to Legumes	Field	2	2	Medium	Active
8	Reminder	Tomato Harvest Approaching	Schedule	5	1	Medium	Active
9	Alert	Soil pH Too Low	Sensor	4	1	High	Active
10	Tip	Mulching Benefits	Farm	1	1	Low	Active

9. Schedules Table

Table Schema

Column Name	Data Type	Description
ScheduleId	`INT` (PK, IDENTITY)	Unique identifier for each schedule
FieldId	`INT` (FK)	Foreign key linking to `Fields(FieldId)`
ScheduleType	`NVARCHAR(50)`	Type of scheduled activity (e.g., Irrigation, Harvest)
Title	`NVARCHAR(200)`	Short title for the schedule
Description	`NVARCHAR(MAX)`	Full details of the scheduled task
ScheduledDate	`DATETIME2`	Date and time the activity is scheduled
Duration	`DECIMAL(5,2)`	Estimated time in hours
EstimatedCost	`DECIMAL(10,2)`	Cost estimate for the scheduled task
Priority	`NVARCHAR(20)`	Priority level: High, Medium, Low
Status	`NVARCHAR(20)`	Task status: Scheduled, Completed, Cancelled, etc.
IsCompleted	`BIT`	0 = pending, 1 = completed
CreatedBy	`INT` (FK)	User who created the schedule
CreatedAt	`DATETIME2`	Timestamp of creation (default: current time)
UpdatedAt	`DATETIME2`	Timestamp of last update (default: current time)

Inserted Records

ScheduleId	FieldId	ScheduleType	Title	ScheduledDate	Duration	Cost	Priority	Status	Completed	CreatedBy
1	1	Irrigation	Early Morning Irrigation	2025-07-02 06:00:00	2.00	300.00	High	Scheduled	0	1
2	2	Fertilization	Apply Urea Fertilizer	2025-07-03 08:00:00	1.50	250.00	Medium	Scheduled	0	2
3	1	Pest Control	Spray Neem Oil	2025-07-04 07:00:00	1.00	150.00	Low	Scheduled	0	1
4	2	Soil Testing	Test for pH and Nutrients	2025-07-05 10:00:00	2.50	500.00	Medium	Scheduled	0	2
5	1	Harvest	Tomato Harvesting	2025-07-06 05:30:00	3.00	0.00	High	Scheduled	0	1
6	2	Irrigation	Evening Drip Irrigation	2025-07-02 18:00:00	1.00	200.00	Low	Scheduled	0	2
7	1	Fertilization	Potassium Supplement	2025-07-08 09:00:00	1.25	180.00	Medium	Scheduled	0	1
8	2	Weed Removal	Manual Weeding	2025-07-09 07:00:00	2.00	100.00	Medium	Scheduled	0	2
9	1	Field Inspection	Expert Crop Checkup	2025-07-10 08:30:00	1.75	0.00	High	Scheduled	0	1
10	2	Pest Control	Deploy Traps	2025-07-11 07:30:00	1.00	120.00	Low	Scheduled	0	2

10. WeatherData Table

Table Schema

Column Name	Data Type	Description
WeatherId	`BIGINT` (PK, IDENTITY)	Unique weather data record ID
Location	`NVARCHAR(255)`	Location name or label
Latitude	`DECIMAL(9,6)`	GPS latitude
Longitude	`DECIMAL(9,6)`	GPS longitude
Temperature	`DECIMAL(5,2)`	Temperature in °C (nullable)
Humidity	`DECIMAL(5,2)`	Humidity in percentage (nullable)
Pressure	`DECIMAL(7,2)`	Atmospheric pressure in hPa (nullable)
WindSpeed	`DECIMAL(5,2)`	Wind speed in km/h (nullable)
WeatherDescription	`NVARCHAR(200)`	Text description of the weather (e.g., Cloudy, Sunny)
ForecastDate	`DATETIME2`	Date & time for which the forecast applies
DataType	`NVARCHAR(20)`	Type of forecast: Current, Hourly, or Daily
RetrievedAt	`DATETIME2`	Timestamp when data was fetched (default: NOW)

Inserted Records

WeatherId	Location	Latitude	Longitude	Temp	Humidity	Pressure	Wind	Description	ForecastDate	Type
1	Agro Farm A	26.8467	80.9462	32.5	60.0	1012.5	5.5	Partly Cloudy	2025-07-02 09:00:00	Current
2	Agro Farm B	26.8467	80.9462	31.2	65.0	1010.8	4.8	Sunny	2025-07-02 12:00:00	Hourly
3	Agro Farm A	26.8467	80.9462	30.0	68.0	1009.2	3.7	Humid	2025-07-03 06:00:00	Daily
4	Agro Farm B	26.8467	80.9462	33.5	55.0	1011.3	6.2	Hot	2025-07-03 09:00:00	Current
5	Agro Farm A	26.8467	80.9462	29.8	70.0	1008.5	2.0	Cloudy	2025-07-04 09:00:00	Daily
6	Agro Farm C	26.7890	80.9950	34.0	52.0	1014.0	7.0	Clear Skies	2025-07-02 18:00:00	Hourly
7	Agro Farm D	26.7600	80.9200	28.5	75.0	1005.0	3.5	Light Rain	2025-07-03 15:00:00	Current
8	Agro Farm E	26.8800	80.9800	27.2	80.0	1003.2	2.5	Heavy Rain	2025-07-04 08:00:00	Daily
9	Agro Farm B	26.8467	80.9462	32.0	62.0	1013.3	5.2	Sunny Intervals	2025-07-05 12:00:00	Hourly
10	Agro Farm C	26.7890	80.9950	30.5	69.0	1007.7	4.0	Overcast	2025-07-06 07:00:00	Daily