Aircraft Manufacturing Company Management System

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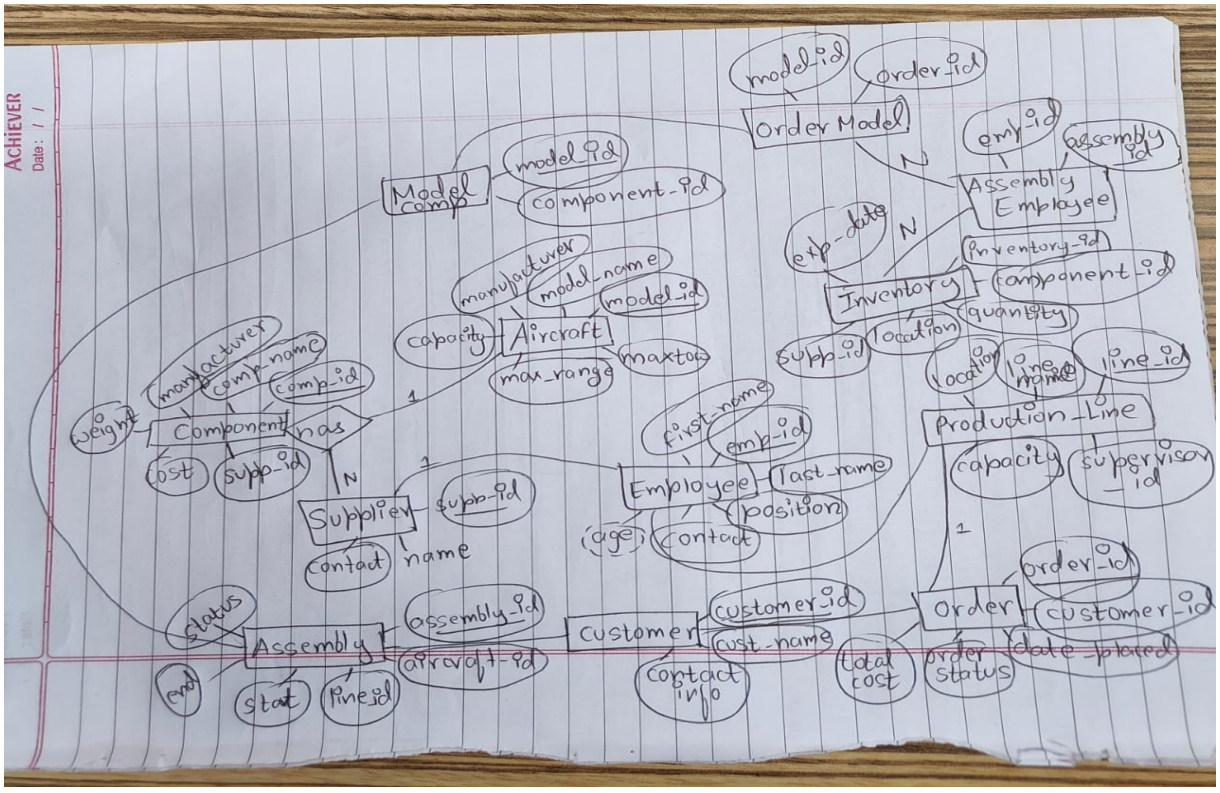
Abstract

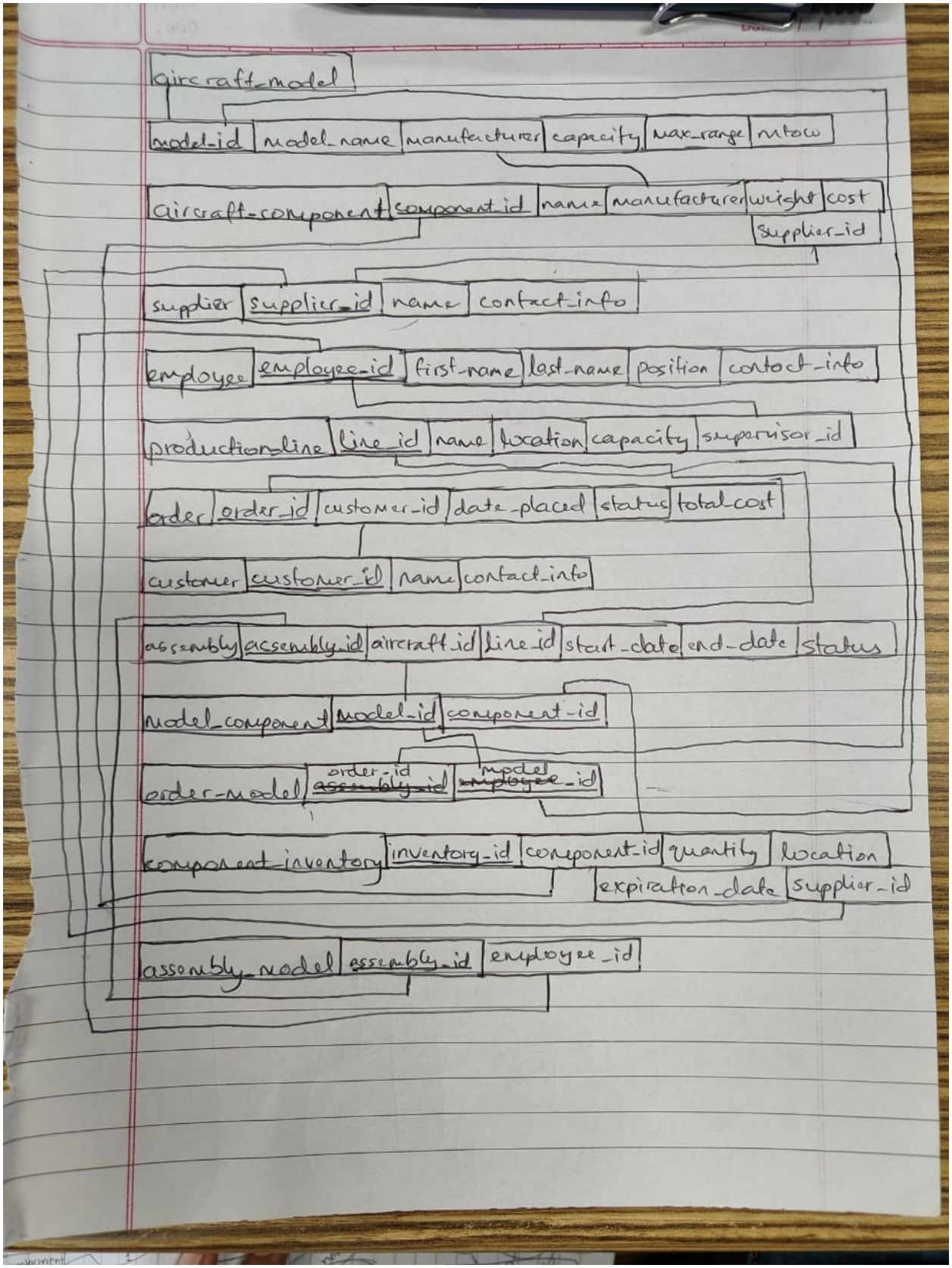
The Aircraft Manufacturing Company Database System is designed to enhance the efficiency and effectiveness of an aircraft manufacturing company's operations. This comprehensive system aims to streamline various aspects of the manufacturing process, from inventory management and production planning to quality control and customer management. By centralizing and automating critical functions, this project seeks to improve the company's overall productivity, maintain high-quality standards, and ensure smooth customer interactions.

The primary purpose of this project is to develop and implement an integrated database system tailored to the specific needs of an aircraft manufacturing company. This system will serve as the backbone of the company's operations, providing essential tools to manage its resources, processes, and data efficiently.

ER Diagram



Relational Schema



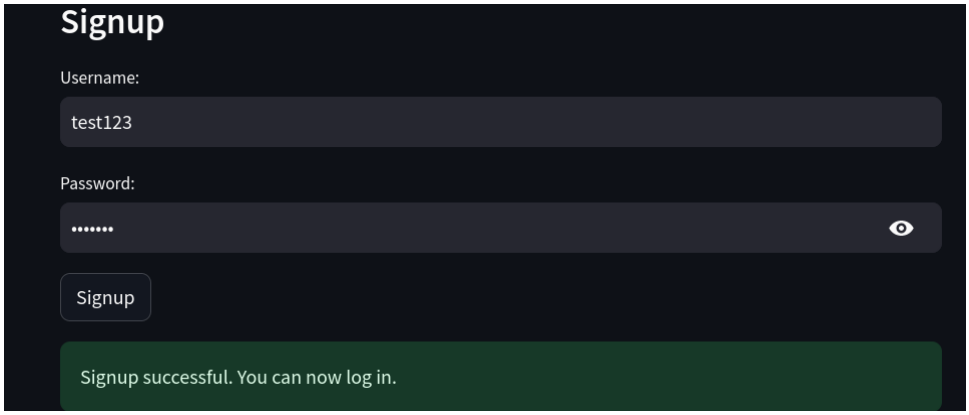
DDL SQL Commands

```
CREATE DATABASE dbms_project;

USE dbms_project;


CREATE TABLE aircraft_model (
  model_id INT NOT NULL AUTO_INCREMENT,
  model_name VARCHAR(255) NOT NULL,
  manufacturer VARCHAR(255) NOT NULL,
  capacity INT,
  max_range INT,
  mtow INT,
  PRIMARY KEY (model_id)
);

CREATE TABLE aircraft_component (
  component_id INT NOT NULL AUTO_INCREMENT,
  component_name VARCHAR(255) NOT NULL,
  manufacturer VARCHAR(255) NOT NULL,
  weight INT,
  cost INT,
  supplier_id INT,
  used_in_model INT
  PRIMARY KEY (component_id),
  FOREIGN KEY (supplier_id) REFERENCES supplier (supplier_id),
  FOREIGN KEY (used_in_model) REFERENCES aircraft_model (model_id)
);

CREATE TABLE supplier (
  supplier_id INT NOT NULL AUTO_INCREMENT,
  name VARCHAR(255) NOT NULL,
  contact_info VARCHAR(255) NOT NULL,
  PRIMARY KEY (supplier_id)
);

CREATE TABLE employee (
  employee_id INT NOT NULL AUTO_INCREMENT,
  fullname VARCHAR(255) NOT NULL,
```

```
  position VARCHAR(255) NOT NULL,
  contact_info VARCHAR(255) NOT NULL,
  PRIMARY KEY (employee_id)
);


CREATE TABLE aircraft_order (
  order_id INT NOT NULL AUTO_INCREMENT,
  customer_id INT,
  date_placed DATE,
  order_status VARCHAR(255),
  total_cost INT,
  PRIMARY KEY (order_id),
  FOREIGN KEY (customer_id) REFERENCES customer (customer_id)
);

CREATE TABLE completed_orders (
  order_id INT NOT NULL AUTO_INCREMENT,
  customer_id INT,
  date_placed DATE,
  order_status VARCHAR(255),
  total_cost INT,
  PRIMARY KEY (order_id),
  FOREIGN KEY (customer_id) REFERENCES customer (customer_id)
);

CREATE TABLE customer (
  customer_id INT NOT NULL AUTO_INCREMENT,
  customer_name VARCHAR(255) NOT NULL,
  contact_info VARCHAR(255) NOT NULL,
  PRIMARY KEY (customer_id)
);
```

CRUD Operations

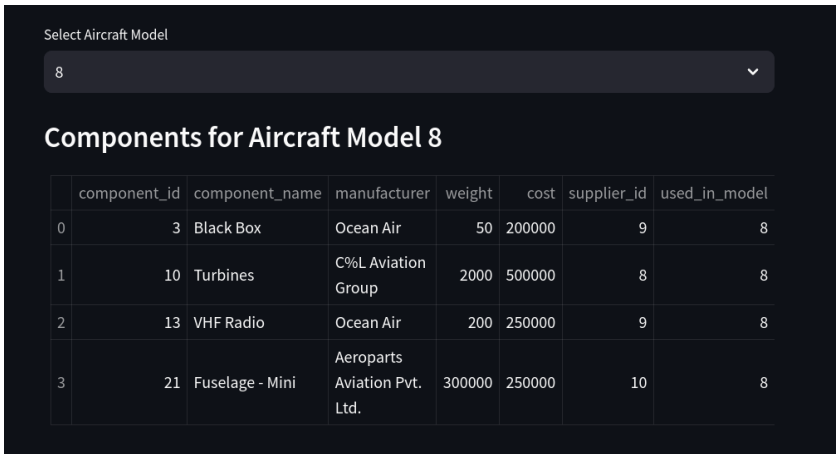
1. Sign Up



2. Aircraft Models Table

	model_id	model_name	manufacturer	capacity	max_range	mtow
0	8	Gulfstream G800	Gulfstream Aerospace Corporation	19	8000	105600
1	9	Gulfstream G280	Gulfstream Aerospace Corporation	10	3600	4750
2	10	Bombardier Challenfer 3500	Bombardier Aviation	10	3400	40750
3	11	Delta Airways	Airbus SE	853	8000	120000
4	14	Boeing 747	Boeing Commercial Airplanes	467	7790	735000

3. Components of each Model



	component_id	component_name	manufacturer	weight	cost	supplier_id	used_in_model
0	3	Black Box	Ocean Air	50	200000	9	8
1	10	Turbines	C%L Aviation Group	2000	500000	8	8
2	13	VHF Radio	Ocean Air	200	250000	9	8
3	21	Fuselage - Mini	Aeroparts Aviation Pvt. Ltd.	300000	250000	10	8

4. Suppliers

	supplier_id	name	contact_info
0	8	C&L Aviation Group	9448124868
1	9	Ocean Air	6364699988
2	10	Aeroparts Aviation Pvt. Ltd.	9986200602

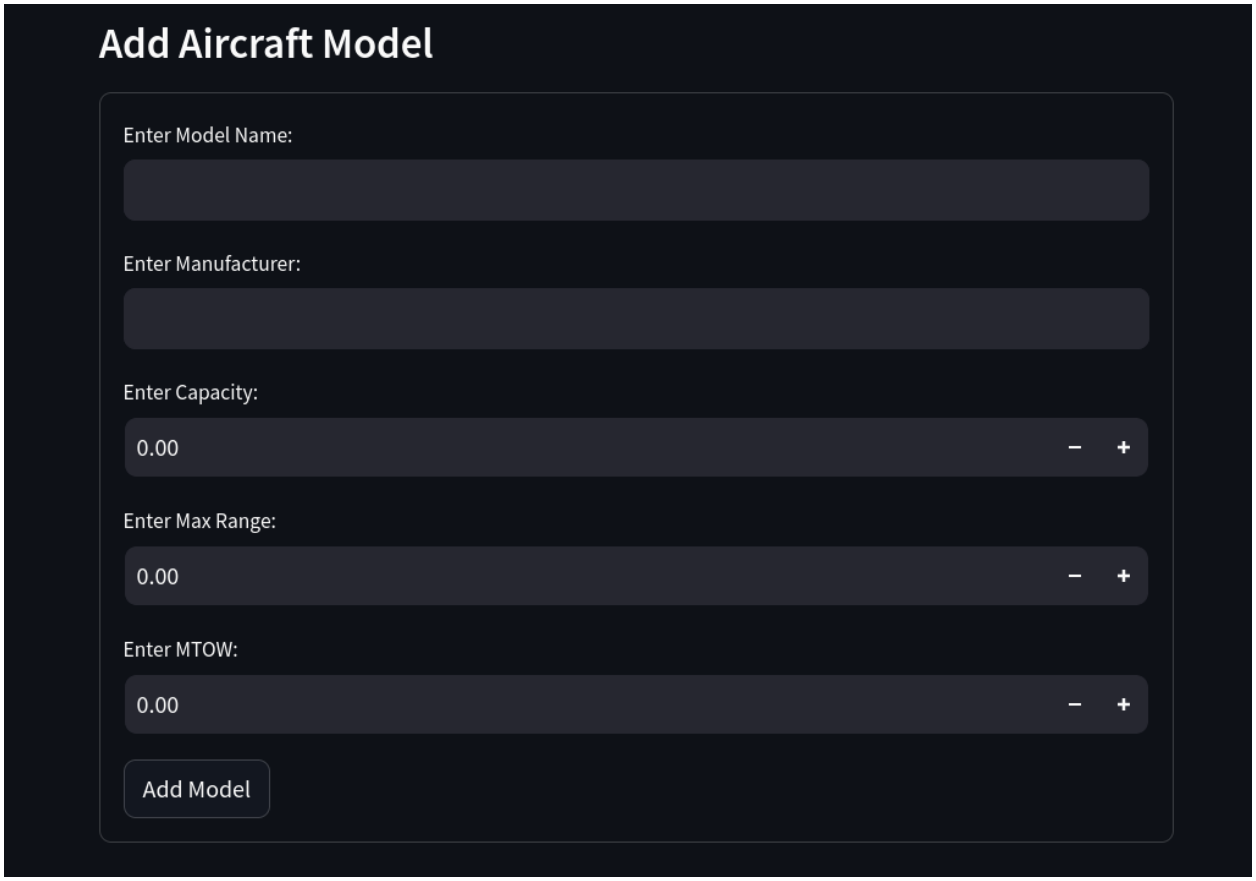
5. Customers

	customer_id	customer_name	contact_info
0	2	skanda	6364699955
1	3	shaarva	9480109539
2	8	Shreesha	9448459539
3	9	Ritvik	6364699955

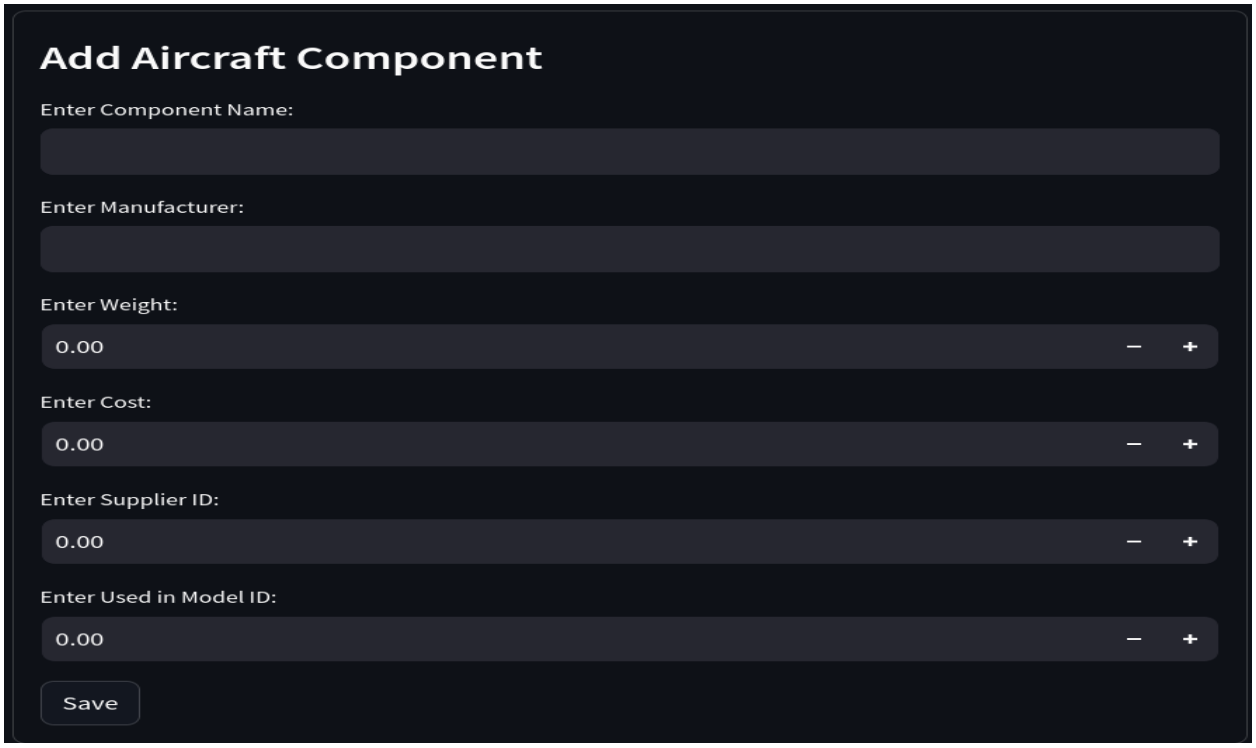
6. Orders

	order_id	customer_id	date_placed	order_status	total_cost
0	121	8	2023-11-17	Complete	50000000
1	122	8	2023-11-17	Order Placed	50000000
2	123	8	2023-11-17	Order Placed	50000000
3	124	9	2023-11-17	Order Placed	30000000
4	125	9	2023-11-20	Order Placed	30000000
5	126	9	2023-11-21	Order Placed	30000000
6	127	9	2023-11-21	Order Placed	30000000
7	128	9	2023-11-21	Order Placed	30000000
8	129	9	2023-11-21	Order Placed	30000000

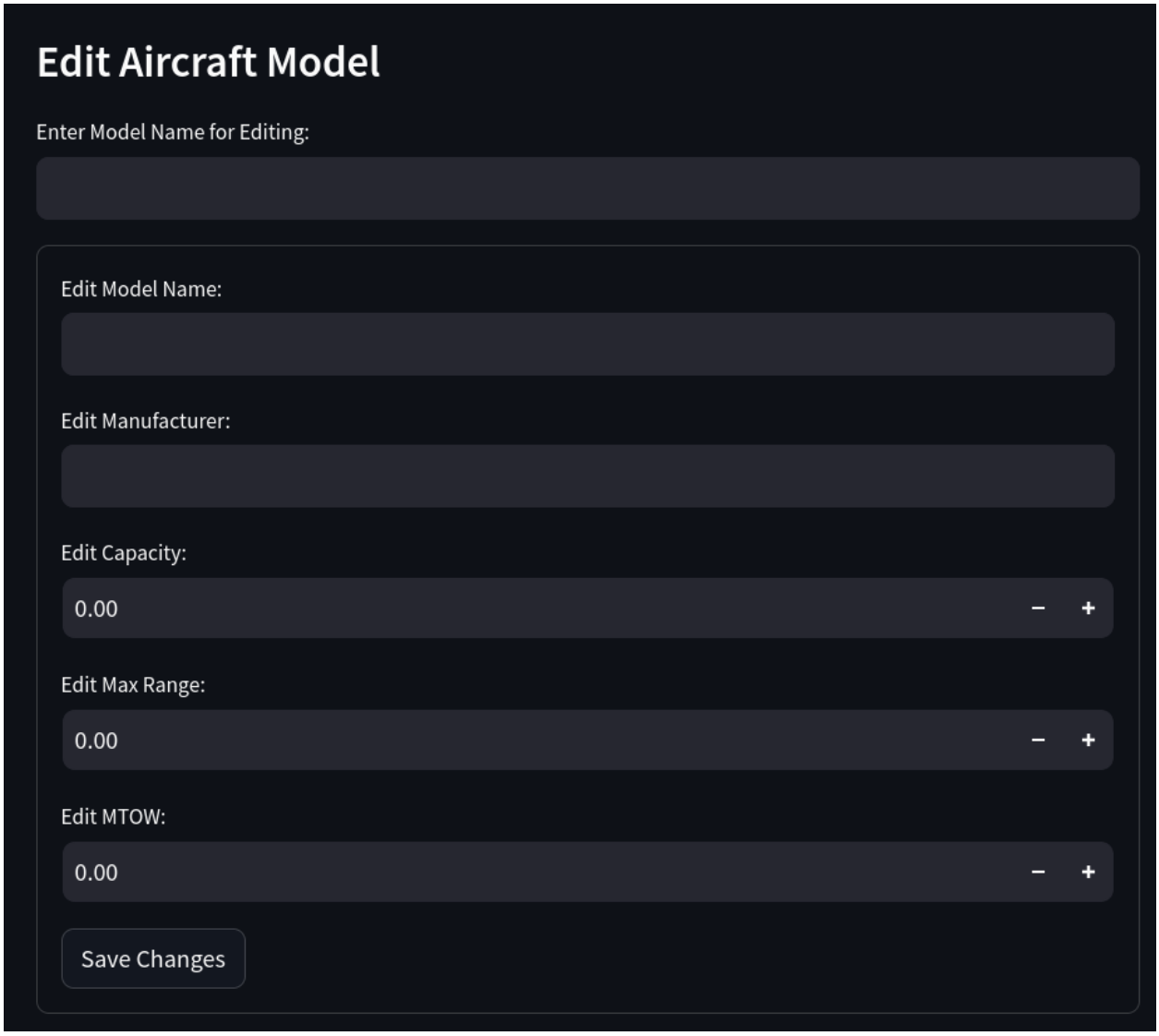
7. Add Aircraft Model



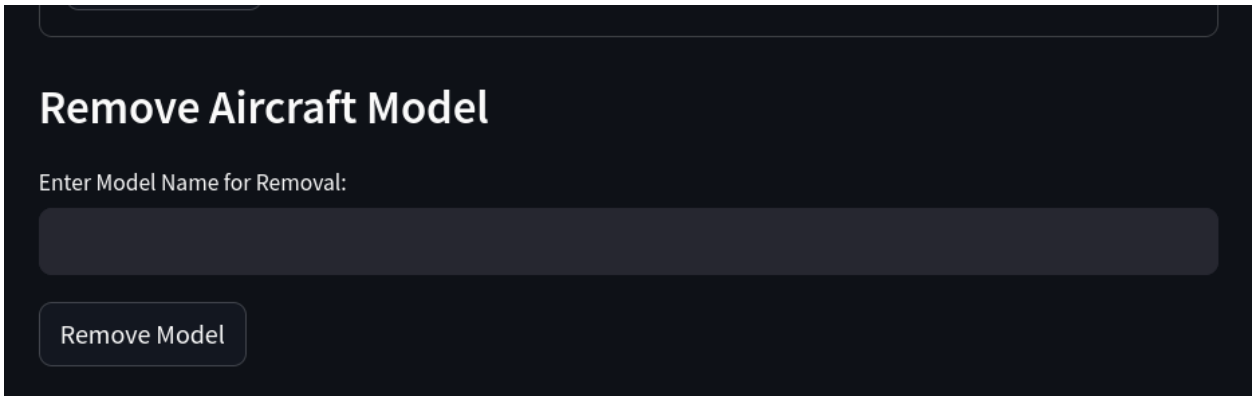
8. Add Aircraft Component



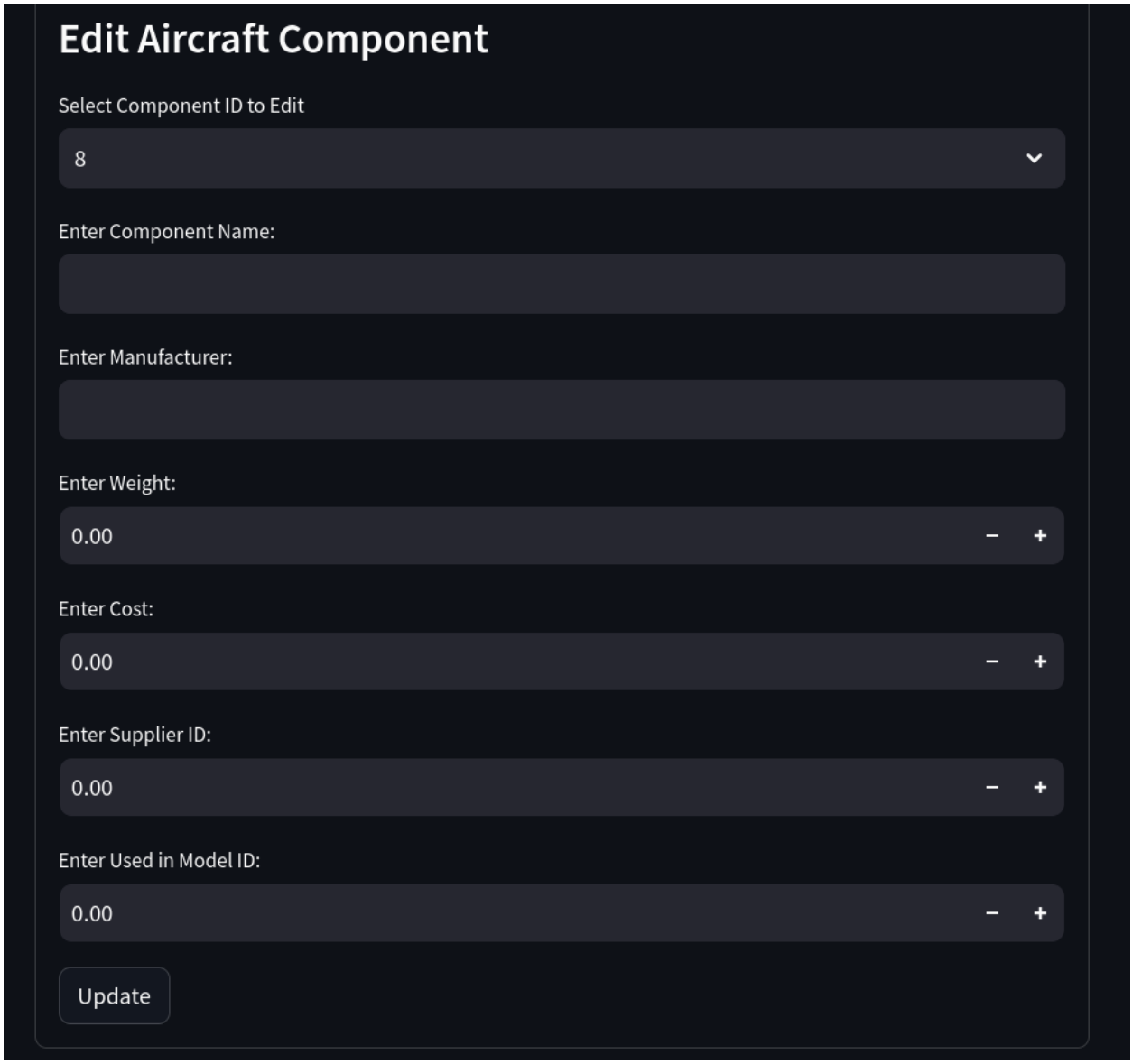
9. Edit Aircraft Model



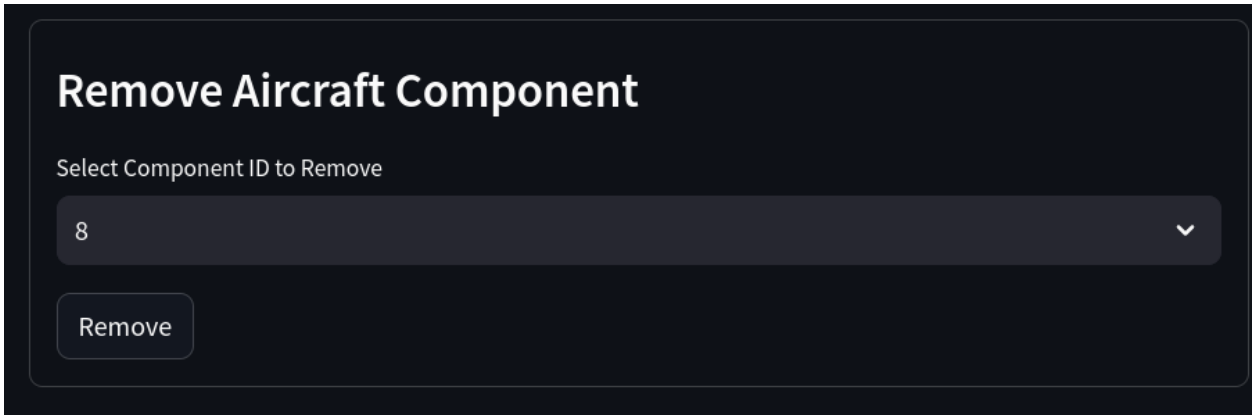
10. Remove Aircraft Model



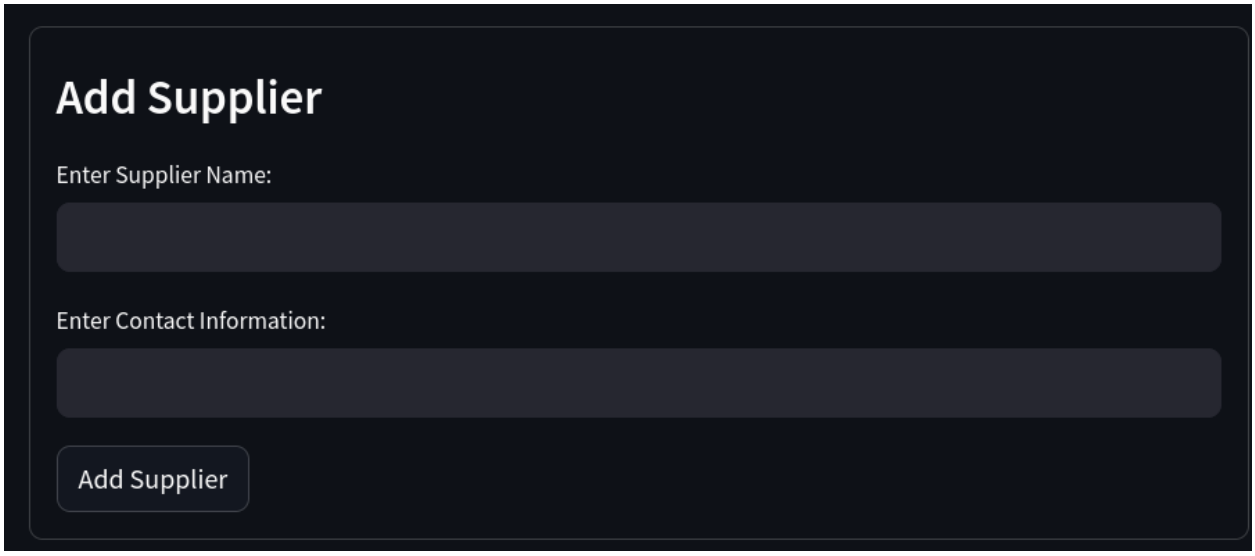
11. Edit Aircraft Component



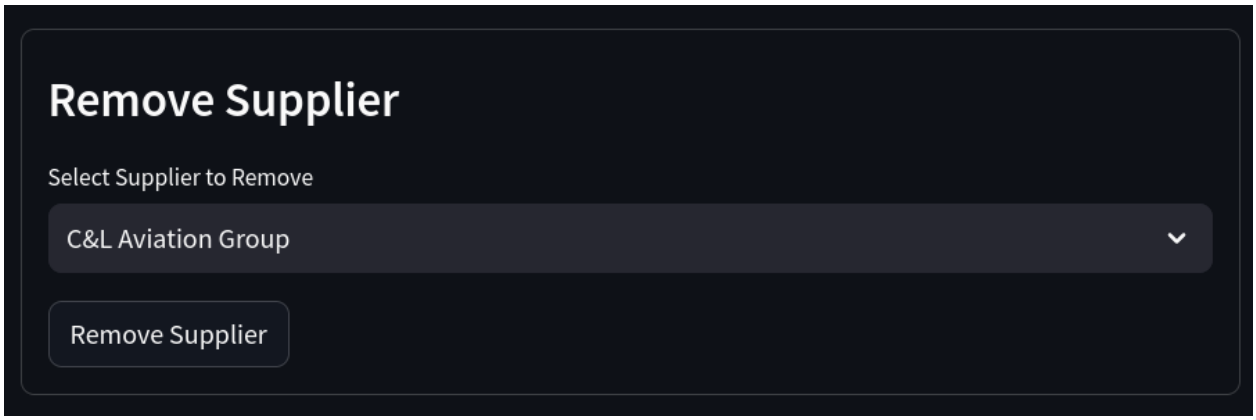
12. Remove Aircraft Component



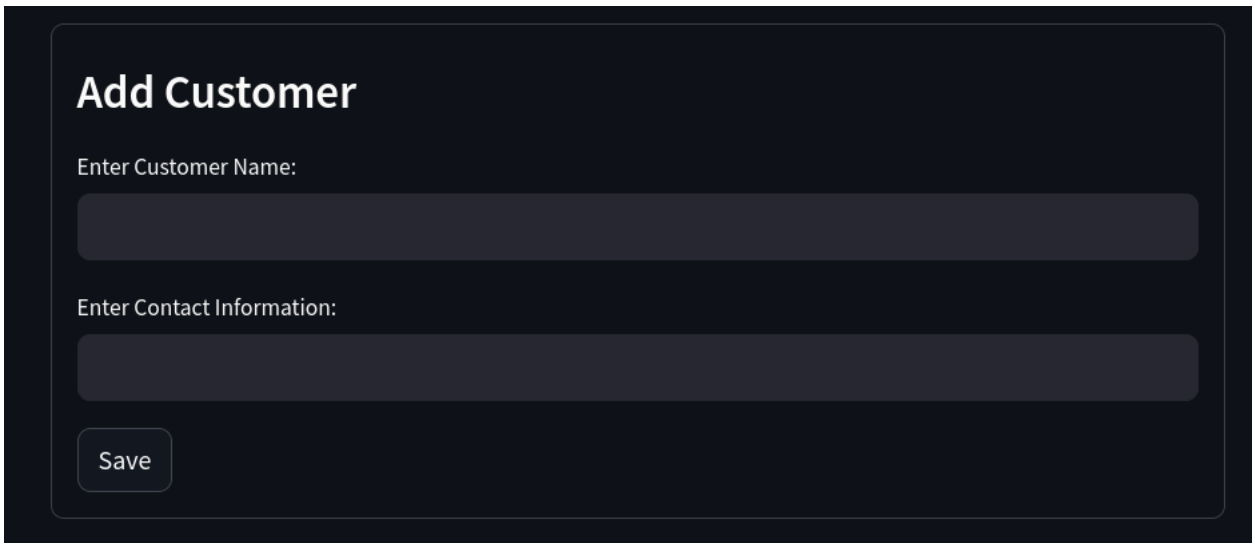
13. Add Supplier



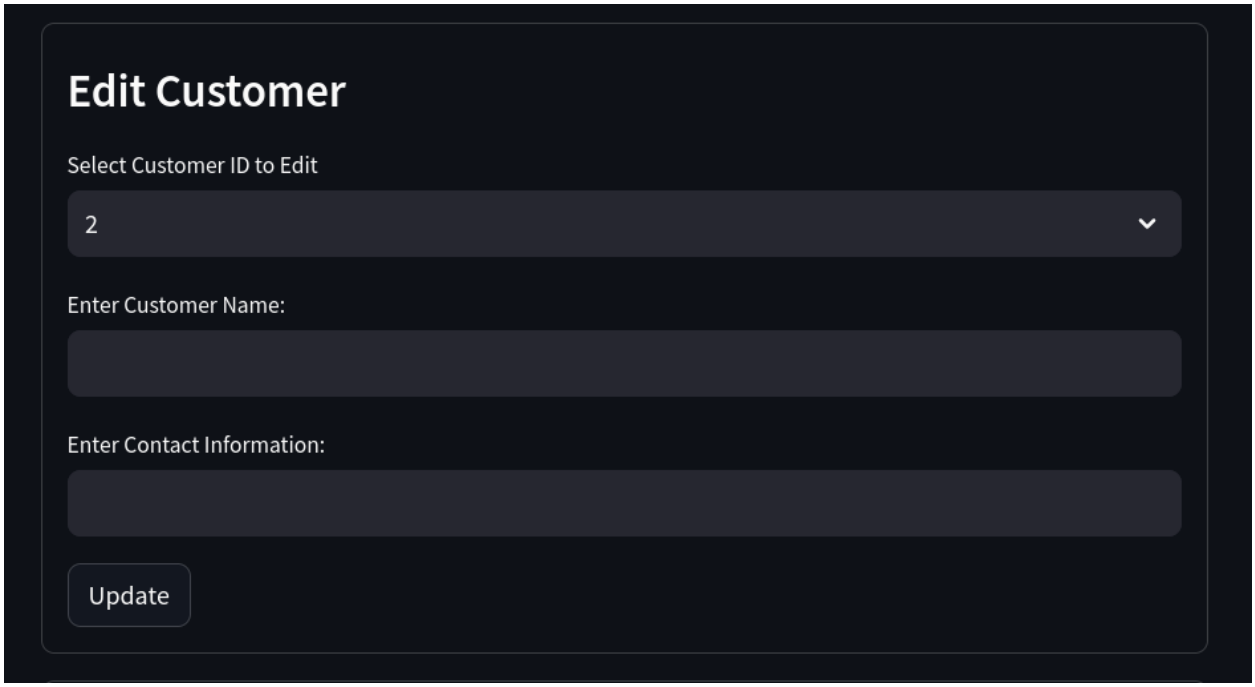
14. Remove Supplier



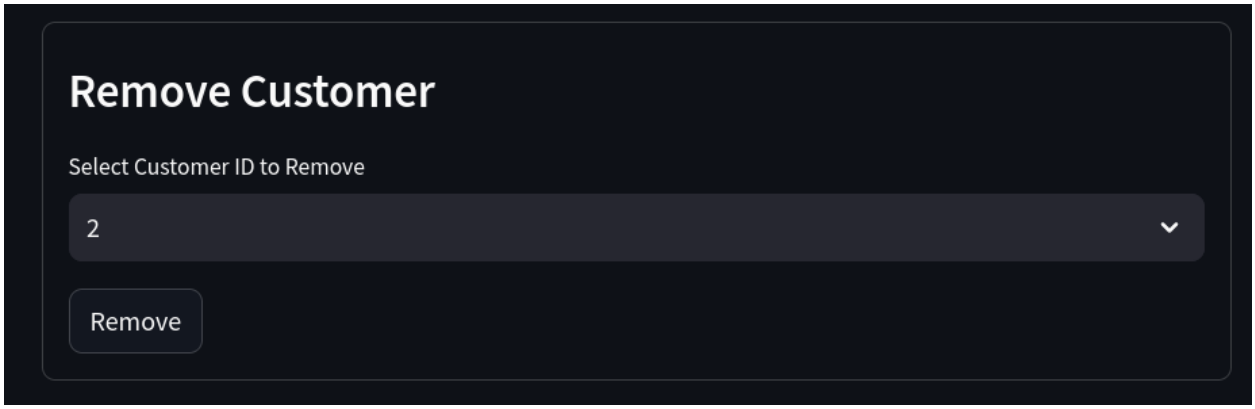
15. Add Customer



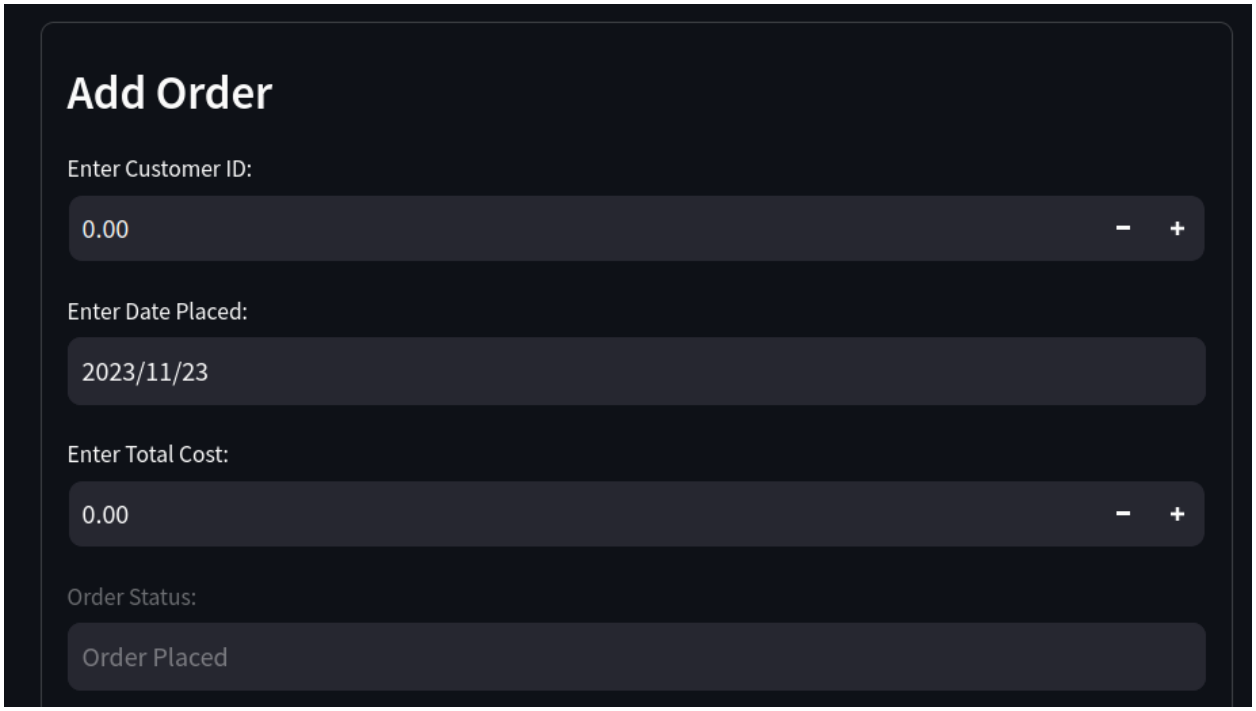
16. Edit Customer



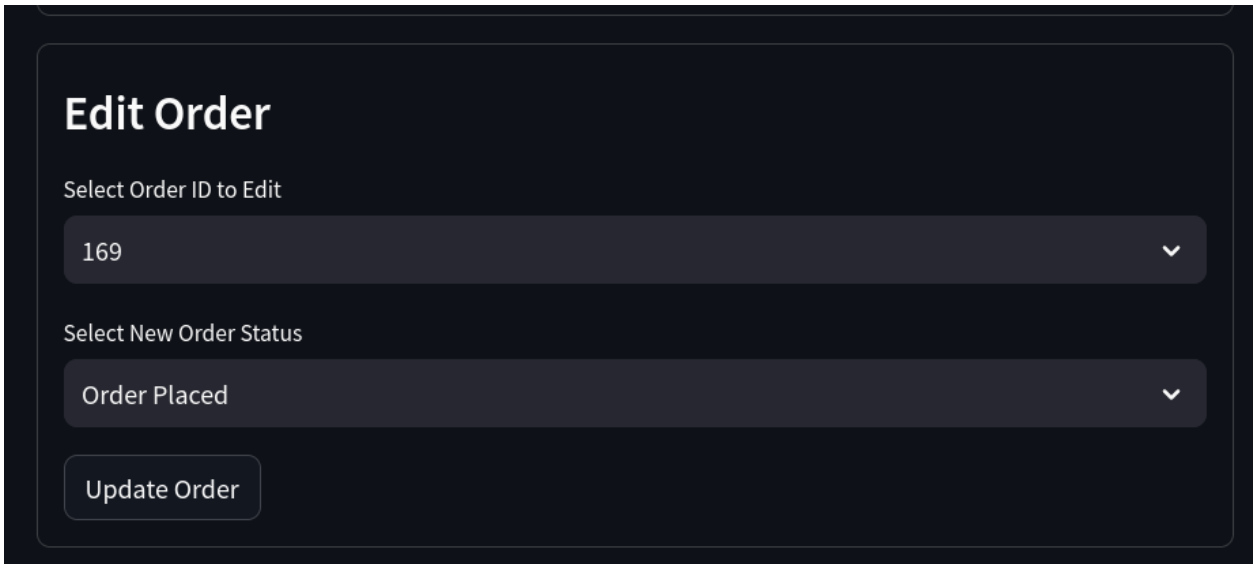
17. Remove Customer



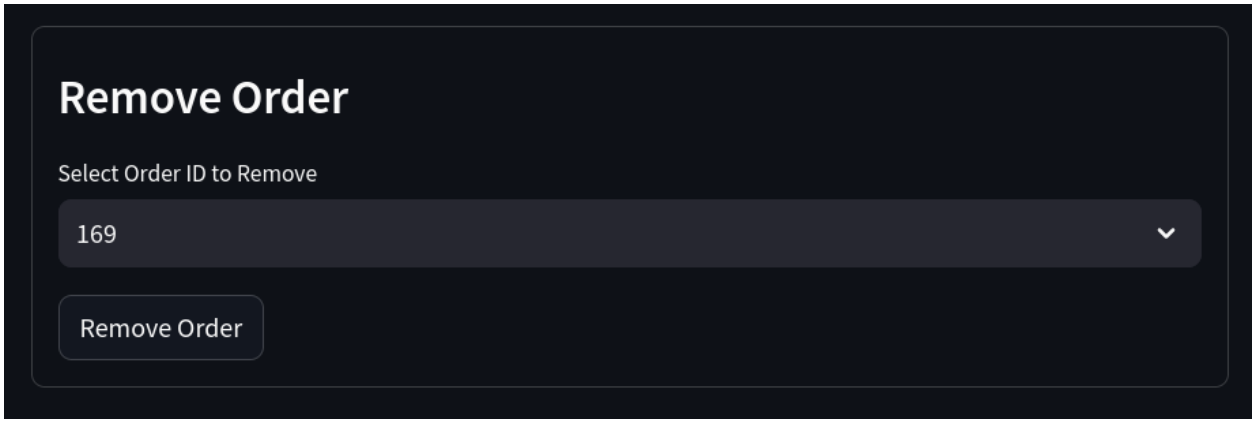
18. Add Order



19. Edit Order

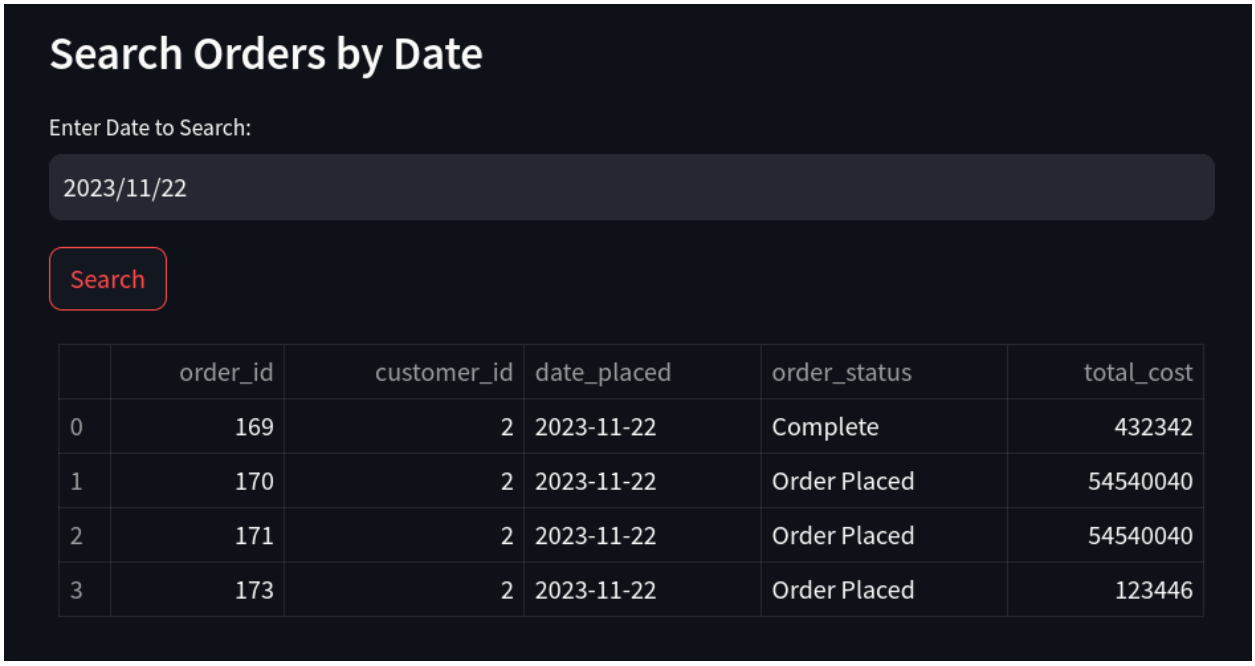


20. Delete Order



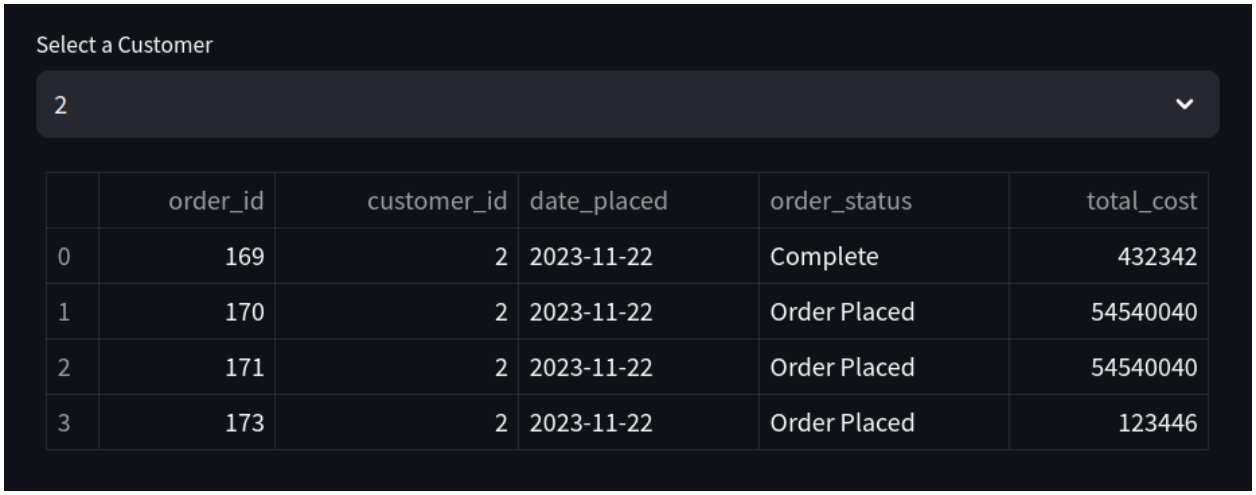
Functionalities

1. Search Orders by Date - Aggregation



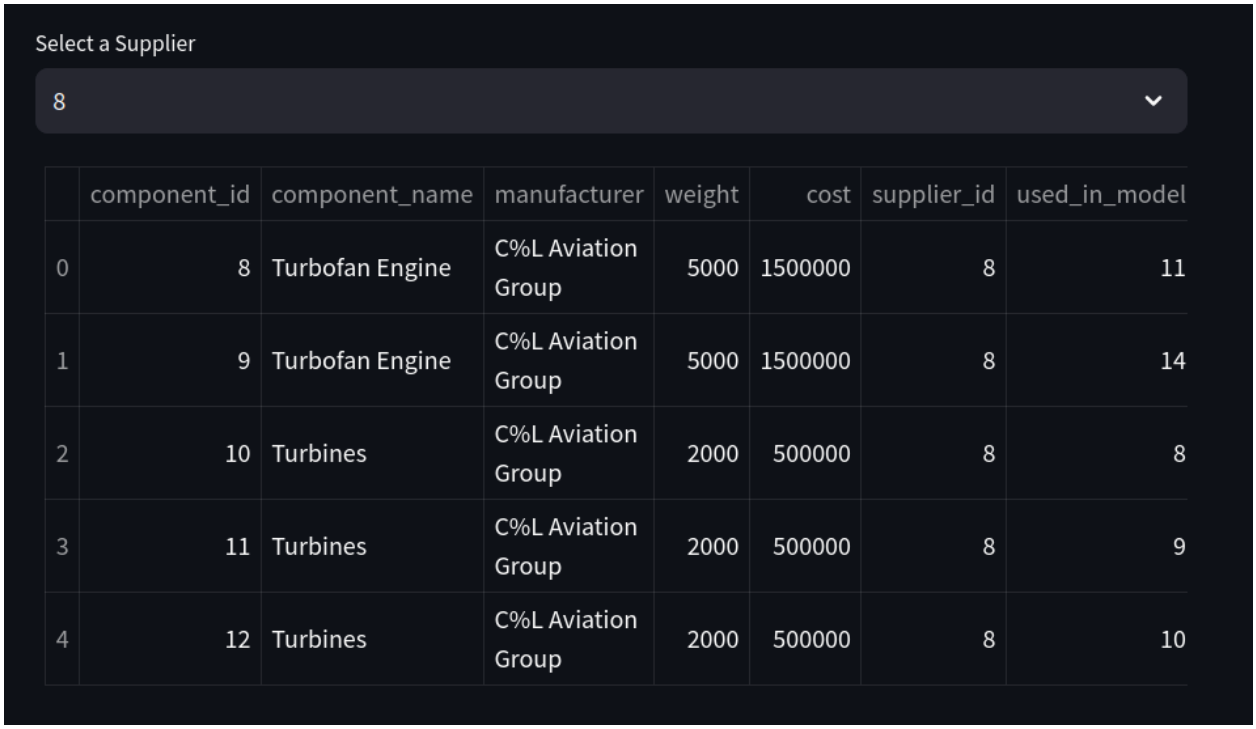
	order_id	customer_id	date_placed	order_status	total_cost
0	169	2	2023-11-22	Complete	432342
1	170	2	2023-11-22	Order Placed	54540040
2	171	2	2023-11-22	Order Placed	54540040
3	173	2	2023-11-22	Order Placed	123446

2. Search Orders by Customers - Aggregation



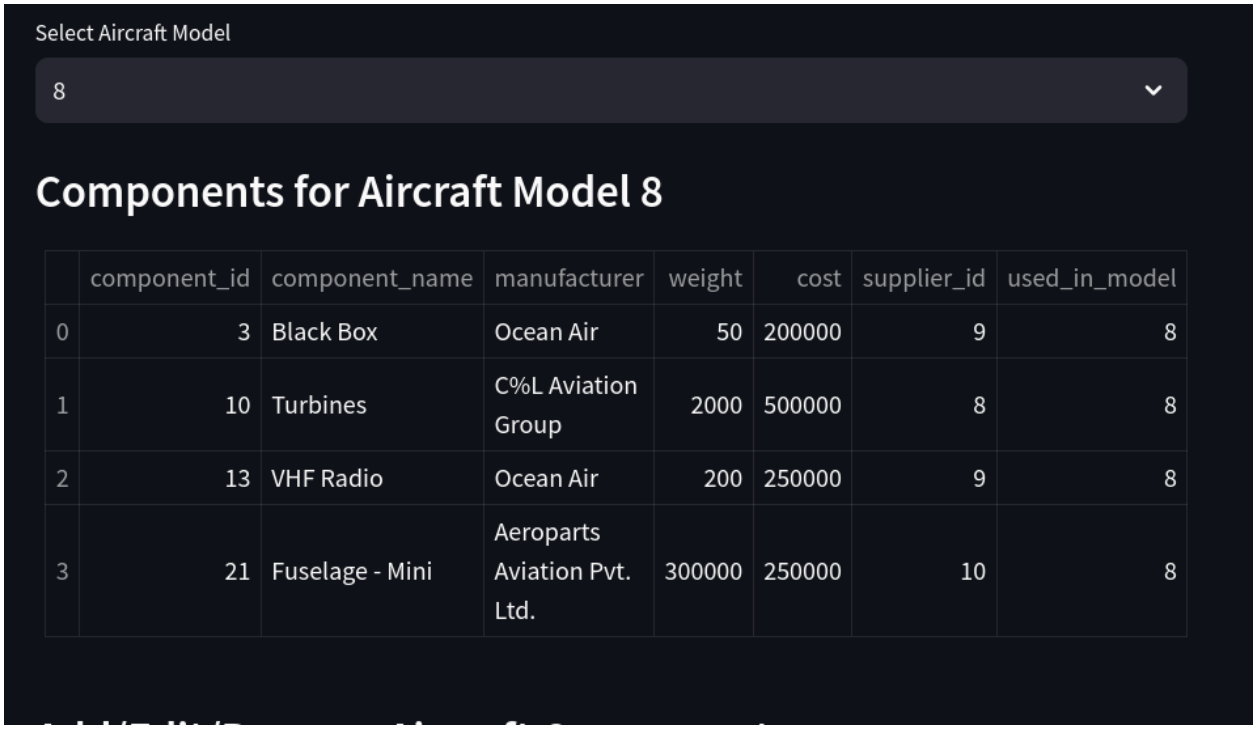
	order_id	customer_id	date_placed	order_status	total_cost
0	169	2	2023-11-22	Complete	432342
1	170	2	2023-11-22	Order Placed	54540040
2	171	2	2023-11-22	Order Placed	54540040
3	173	2	2023-11-22	Order Placed	123446

3. Search Components by Supplier - Join Query



	component_id	component_name	manufacturer	weight	cost	supplier_id	used_in_model
0	8	Turbofan Engine	C%L Aviation Group	5000	1500000	8	11
1	9	Turbofan Engine	C%L Aviation Group	5000	1500000	8	14
2	10	Turbines	C%L Aviation Group	2000	500000	8	8
3	11	Turbines	C%L Aviation Group	2000	500000	8	9
4	12	Turbines	C%L Aviation Group	2000	500000	8	10

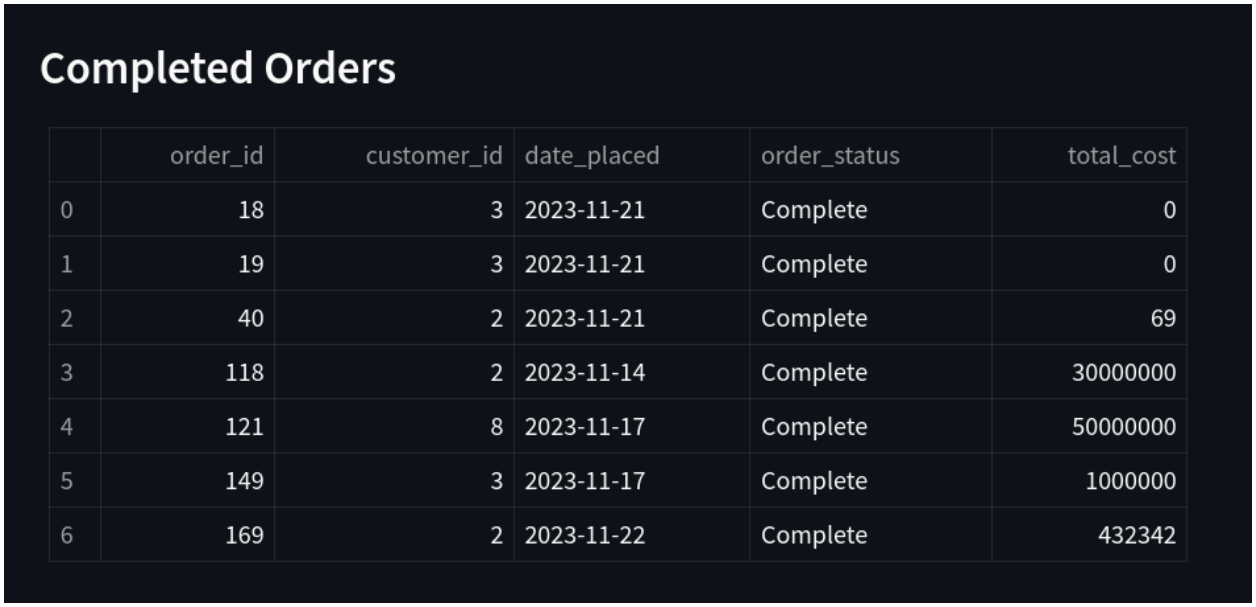
4. Search Components by Aircraft Model - Nested Query



	component_id	component_name	manufacturer	weight	cost	supplier_id	used_in_model
0	3	Black Box	Ocean Air	50	200000	9	8
1	10	Turbines	C%L Aviation Group	2000	500000	8	8
2	13	VHF Radio	Ocean Air	200	250000	9	8
3	21	Fuselage - Mini	Aeroparts Aviation Pvt. Ltd.	300000	250000	10	8

Procedures/Functions/Triggers

1. Orders marked as Complete are added to completed_orders table

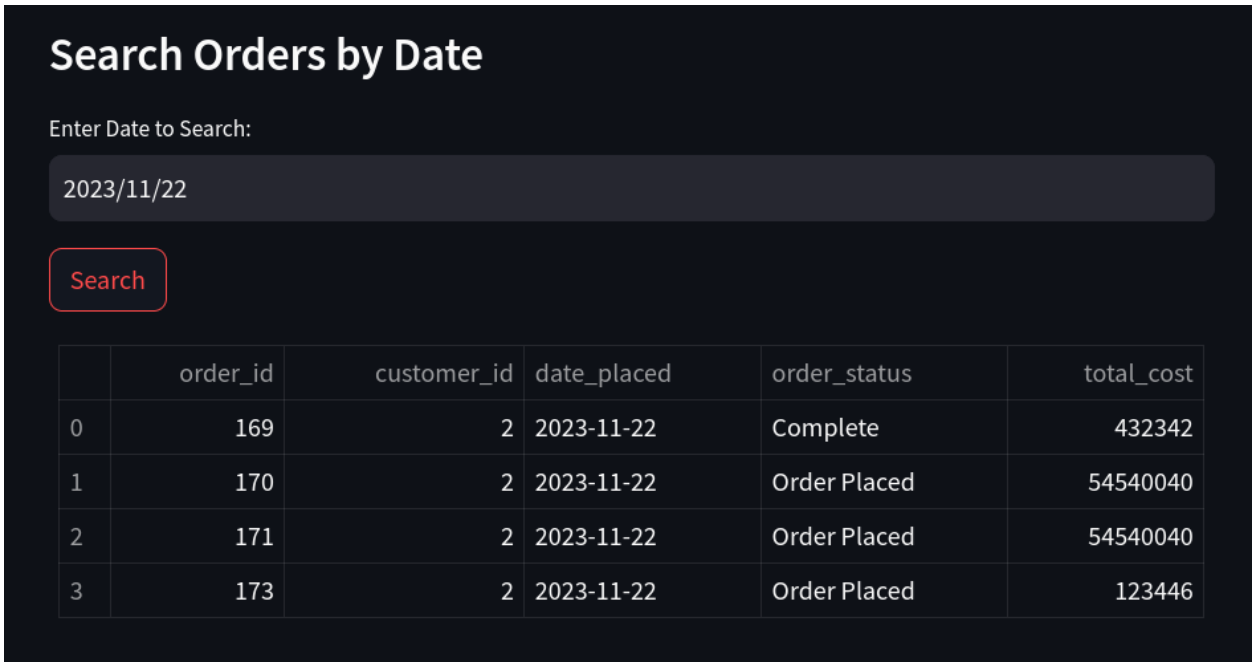


	order_id	customer_id	date_placed	order_status	total_cost
0	18	3	2023-11-21	Complete	0
1	19	3	2023-11-21	Complete	0
2	40	2	2023-11-21	Complete	69
3	118	2	2023-11-14	Complete	30000000
4	121	8	2023-11-17	Complete	50000000
5	149	3	2023-11-17	Complete	1000000
6	169	2	2023-11-22	Complete	432342

```
DELIMITER //

CREATE TRIGGER after_update_aircraft_order
AFTER UPDATE ON aircraft_order
```

```
FOR EACH ROW
BEGIN
   -- Check if the order_status is updated to 'Complete'
   IF NEW.order_status = 'Complete' THEN
      -- Insert the completed order into the completed_orders table
       INSERT INTO completed_orders (order_id, customer_id, date_placed, order_status,
total_cost)
       VALUES (NEW.order_id, NEW.customer_id, NEW.date_placed, NEW.order_status,
NEW.total_cost);
   END IF;
END //

DELIMITER ;
```

2. Procedure to Search Orders by Date



	order_id	customer_id	date_placed	order_status	total_cost
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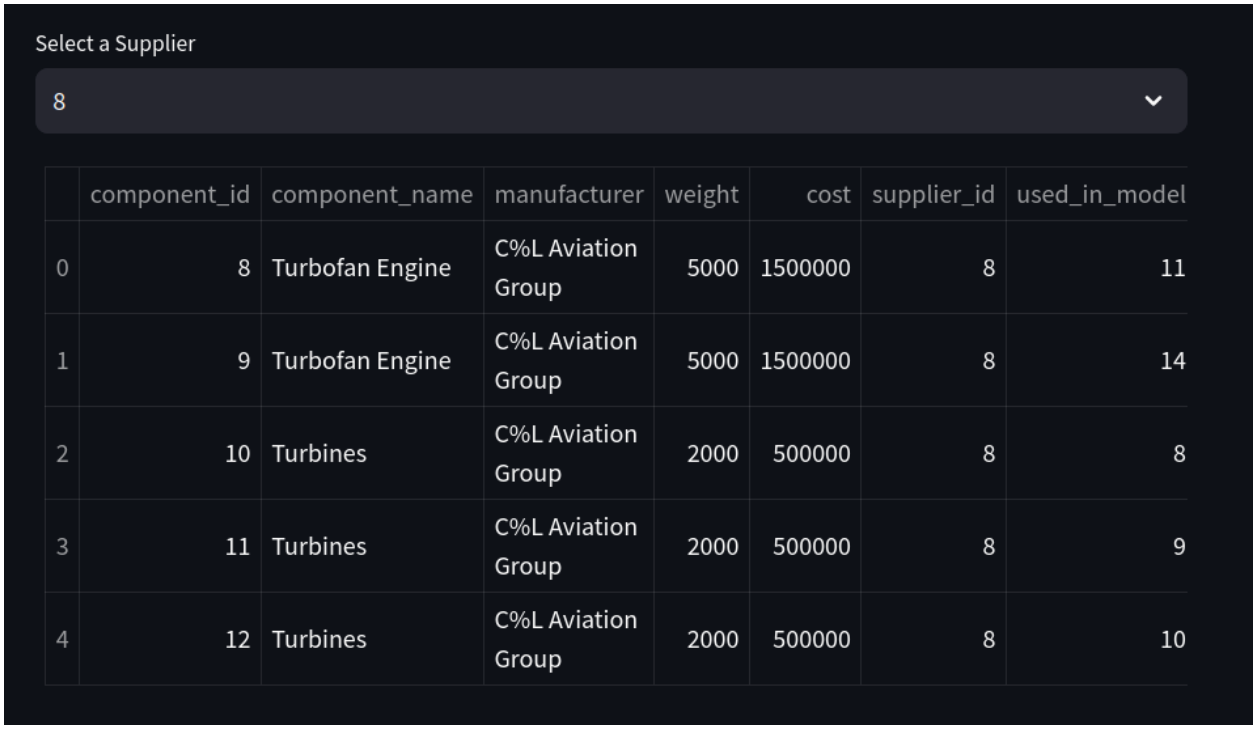
1	170	2	2023-11-22	Order Placed	54540040
2	171	2	2023-11-22	Order Placed	54540040
3	173	2	2023-11-22	Order Placed	123446

```
DELIMITER //

CREATE PROCEDURE SearchOrdersBySingleDate(IN search_date DATE)
BEGIN
        SELECT *
        FROM aircraft_order
        WHERE date_placed = search_date;
END //
```

DELIMITER ;

3. Procedure to Search Suppliers by Component



	component_id	component_name	manufacturer	weight	cost	supplier_id	used_in_model
0	8	Turbofan Engine	C%L Aviation Group	5000	1500000	8	11
1	9	Turbofan Engine	C%L Aviation Group	5000	1500000	8	14
2	10	Turbines	C%L Aviation Group	2000	500000	8	8
3	11	Turbines	C%L Aviation Group	2000	500000	8	9
4	12	Turbines	C%L Aviation Group	2000	500000	8	10

```
DELIMITER //

CREATE PROCEDURE SearchComponentsBySupplierId(IN supplier_id INT)
BEGIN
	SELECT *
	FROM aircraft_component
	WHERE supplier_id = supplier_id;
END //

DELIMITER ;
```