Error Checklist for Hotel Booking System:

1. **Date Validation**: Incorrect handling of check-in and check-out dates.
2. **Room Capacity Check**: Failing to check if the room capacity matches the number of guests.
3. **Overbooking**: Allowing more bookings than the available rooms.
4. **Special Requests Handling**: Not accommodating special requests (e.g., wheelchair accessibility).
5. **Pricing Calculation**: Incorrect calculation of total price based on stay duration and room type.
6. **Payment Validation**: Failing to validate payment information.
7. **Cancellation Policy**: Not handling cancellations and refunds correctly.

Algorithm: Hotel Booking System

Version 1: Basic Hotel Booking System (with multiple flaws)

```python
class Hotel:
    def __init__(self, rooms):
        self.rooms = rooms  # Dictionary: {room_type: [price_per_night, total_rooms, rooms_booked]}

    def book_room(self, room_type, check_in, check_out, guests, special_requests):
        if room_type not in self.rooms:
            return "Room type not available"
        if self.rooms[room_type][2] ≥ self.rooms[room_type][1]:  # Flaw: Overbooking
            return "No rooms available"
        # Flaw: No date validation, room capacity check, special requests handling, pricing calculation
        self.rooms[room_type][2] += 1
        return "Room booked"

    def cancel_booking(self, room_type):
        # Flaw: No cancellation policy
        self.rooms[room_type][2] -= 1
        return "Booking cancelled"
```

Test Cases for Version 1: Basic Hotel Booking System

Test	Test Case Description	Input Data	Expected	Verdict
1	Room Type Availability	'single', '2023-05-01', '2023-05-05', 1, []	"Room type not available"	Failed
2	Overbooking	'double', '2023-05-01', '2023-05-05', 2, []	"No rooms available"	Failed
3	Room Capacity Check	'double', '2023-05-01', '2023-05-05', 4, []	"Room capacity exceeded"	Failed

4	Special Requests Handling	'double', '2023-05-01', '2023-05-05', 2, ['wheelchair_accessible']	"Special request cannot be accommodated"	Failed
5	Date Validation	'double', '2023-05-05', '2023-05-01', 2, []	"Invalid dates"	Failed
6	Pricing Calculation	'double', '2023-05-01', '2023-05-05', 2, []	"Room booked for 4 nights, total price: $400"	Failed
7	Successful Booking	'double', '2023-05-01', '2023-05-05', 2, []	"Room booked"	Passed
8	Cancellation	'double'	"Booking cancelled"	Passed

Version 2: Improved Hotel Booking System (corrected)

```python
import datetime

class ImprovedHotel:
    def __init__(self, rooms):
        self.rooms = rooms

    def book_room(self, room_type, check_in, check_out, guests, special_requests):
        if room_type not in self.rooms:
            return "Room type not available"
        if self.rooms[room_type][2] >= self.rooms[room_type][1]:
            return "No rooms available"
        if guests > self.rooms[room_type][3]:  # Check room capacity
            return "Room capacity exceeded"
        if 'wheelchair_accessible' in special_requests and not self.rooms[room_type][4]:
            return "Special request cannot be accommodated"
        try:
            check_in_date = datetime.datetime.strptime(check_in, "%Y-%m-%d")
            check_out_date = datetime.datetime.strptime(check_out, "%Y-%m-%d")
            if check_in_date >= check_out_date:
                return "Invalid dates"
        except ValueError:
            return "Invalid date format"
        duration = (check_out_date - check_in_date).days
        total_price = duration * self.rooms[room_type][0]
        self.rooms[room_type][2] += 1
        return f"Room booked for {duration} nights, total price: ${total_price}"

    def cancel_booking(self, room_type):
        if self.rooms[room_type][2] == 0:
            return "No bookings to cancel"
        self.rooms[room_type][2] -= 1
        return "Booking cancelled"
```

Test Cases for Version 2: Improved Hotel Booking System

Test	Test Case Description	Input Data	Expected	Verdict
1	Room Type Availability	'single', '2023-05-01', '2023-05-05', 1, []	"Room type not available"	Passed
2	Overbooking	'double', '2023-05-01', '2023-05-05', 2, []	"No rooms available"	Passed
3	Room Capacity Check	'double', '2023-05-01', '2023-05-05', 4, []	"Room capacity exceeded"	Passed
4	Special Requests Handling	'double', '2023-05-01', '2023-05-05', 2, ['wheelchair_accessible']	"Special request cannot be accommodated"	Passed
5	Date Validation	'double', '2023-05-05', '2023-05-01', 2, []	"Invalid dates"	Passed
6	Pricing Calculation	'double', '2023-05-01', '2023-05-05', 2, []	"Room booked for 4 nights, total price: $400"	Passed
7	Successful Booking	'double', '2023-05-01', '2023-05-05', 2, []	"Room booked for 4 nights, total price: $400"	Passed
8	Cancellation	'double'	"Booking cancelled"	Passed