**Assignment 5**

**Control Structure**

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**Task 1: Conditional Statements**

In a BookingSystem, you have been given the task is to create a program to book tickets. if available tickets more than noOfTicket to book then display the remaining tickets or ticket unavailable:

**Tasks:**

1. Write a program that takes the availableTicket and noOfBookingTicket as input.
2. Use conditional statements (if-else) to determine if the ticket is available or not.

3. Display an appropriate message based on ticket availability.

def check\_ticket\_availability(available\_tickets, no\_of\_tickets\_to\_book):

if available\_tickets >= no\_of\_tickets\_to\_book:

remaining\_tickets = available\_tickets - no\_of\_tickets\_to\_book

print(f"Tickets available! Remaining tickets: {remaining\_tickets}")

else:

print("Tickets unavailable!")

# Example 1

available\_tickets = 50

no\_of\_tickets\_to\_book = 3

check\_ticket\_availability(available\_tickets, no\_of\_tickets\_to\_book)

Screenshot 2024-04-25 at 3.35.14 PM

# Example 2

available\_tickets = 5

no\_of\_tickets\_to\_book = 7

check\_ticket\_availability(available\_tickets, no\_of\_tickets\_to\_book)

Screenshot 2024-04-25 at 3.39.02 PM

**Task 2: Nested Conditional Statements**

Create a program that simulates a Ticket booking and calculating cost of tickets. Display tickets options such as "Silver", "Gold", "Dimond". Based on ticket category fix the base ticket price and get the user input for ticket type and no of tickets need and calculate the total cost of tickets booked.

def calculate\_ticket\_cost(ticket\_type, num\_tickets):

base\_prices = {"Silver": 100, "Gold": 200, "Diamond": 300}

if ticket\_type in base\_prices:

base\_price = base\_prices[ticket\_type]

total\_cost = base\_price \* num\_tickets

return total\_cost

else:

return None

ticket\_type = input("Enter ticket type (Silver/Gold/Diamond): ")

num\_tickets = int(input("Enter number of tickets: "))

total\_cost = calculate\_ticket\_cost(ticket\_type, num\_tickets)

if total\_cost is not None:

print(f"Total cost for {num\_tickets} {ticket\_type} tickets: {total\_cost}")

else:

print("Invalid ticket type!")



**Task 3: Looping**

From the above task book the tickets for repeatedly until user type "Exit"

def calculate\_ticket\_cost(ticket\_type, num\_tickets):

base\_prices = {"Silver": 100, "Gold": 200, "Diamond": 300}

if ticket\_type in base\_prices:

base\_price = base\_prices[ticket\_type]

total\_cost = base\_price \* num\_tickets

return total\_cost

else:

return None

while True:

ticket\_type = input("Enter ticket type (Silver/Gold/Diamond), or type 'Exit' to quit: ")

if ticket\_type.lower() == "exit":

print("Exiting ticket booking system.")

break

num\_tickets = int(input("Enter number of tickets: "))

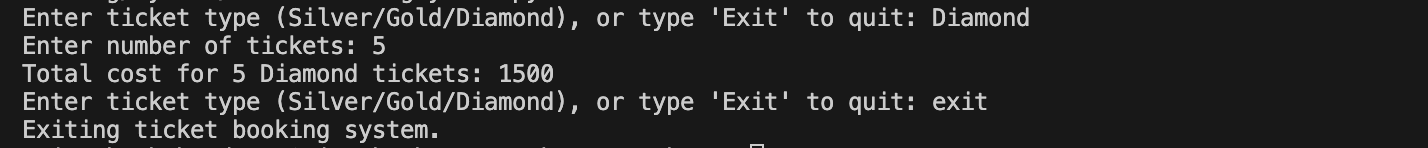
total\_cost = calculate\_ticket\_cost(ticket\_type, num\_tickets)

if total\_cost is not None:

print(f"Total cost for {num\_tickets} {ticket\_type} tickets: {total\_cost}")

else:

print("Invalid ticket type!")



**Task 4: Class & Object**

**Create a Following classes with the following attributes and methods:**

1. **Event** Class**:**

• **Attributes:**

o event\_name,

o event\_date DATE,

o event\_time TIME,

o venue\_name,

o total\_seats,

o available\_seats,

o ticket\_price DECIMAL,

o event\_type ENUM('Movie', 'Sports', 'Concert')

• **Methods and Constuctors:**

o Implement default constructors and overload the constructor with Customer

attributes, generate getter and setter, (print all information of attribute) methods for

the attributes.

o **calculate\_total\_revenue()**: Calculate and return the total revenue based on the

number of tickets sold.

o **getBookedNoOfTickets()**: return the total booked tickets

o **book\_tickets(num\_tickets)**: Book a specified number of tickets for an event. Initially

available seats are equal to the total seats when tickets are booked available seats

number should be reduced.

o **cancel\_booking(num\_tickets)**: Cancel the booking and update the available seats.

o **display\_event\_details():** Display event details, including event name, date time seat

availability.

class Event:

def \_\_init\_\_(self, event\_name, event\_date, event\_time, venue\_name, total\_seats, ticket\_price, event\_type):

self.event\_name = event\_name

self.event\_date = event\_date

self.event\_time = event\_time

self.venue\_name = venue\_name

self.total\_seats = total\_seats

self.available\_seats = total\_seats

self.ticket\_price = ticket\_price

self.event\_type = event\_type

# Getter and Setter methods

def get\_event\_name(self):

return self.event\_name

def set\_event\_name(self, event\_name):

self.event\_name = event\_name

def get\_event\_date(self):

return self.event\_date

def set\_event\_date(self, event\_date):

self.event\_date = event\_date

def get\_event\_time(self):

return self.event\_time

def set\_event\_time(self, event\_time):

self.event\_time = event\_time

def get\_venue\_name(self):

return self.venue\_name

def set\_venue\_name(self, venue\_name):

self.venue\_name = venue\_name

def get\_total\_seats(self):

return self.total\_seats

def set\_total\_seats(self, total\_seats):

self.total\_seats = total\_seats

def get\_available\_seats(self):

return self.available\_seats

def set\_available\_seats(self, available\_seats):

self.available\_seats = available\_seats

def get\_ticket\_price(self):

return self.ticket\_price

def set\_ticket\_price(self, ticket\_price):

self.ticket\_price = ticket\_price

def get\_event\_type(self):

return self.event\_type

def set\_event\_type(self, event\_type):

self.event\_type = event\_type

# methods

def calculate\_total\_revenue(self):

return self.ticket\_price \* (self.total\_seats - self.available\_seats)

def get\_booked\_no\_of\_tickets(self):

return self.total\_seats - self.available\_seats

def book\_tickets(self, num\_tickets):

if num\_tickets > self.available\_seats:

print("Insufficient seats available!")

return False

else:

self.available\_seats -= num\_tickets

print(f"{num\_tickets} tickets booked successfully for the event '{self.event\_name}'")

return True

def cancel\_booking(self, num\_tickets):

if self.available\_seats + num\_tickets > self.total\_seats:

print("Invalid number of tickets to cancel!")

return False

else:

self.available\_seats += num\_tickets

print(f"{num\_tickets} tickets canceled successfully for the event '{self.event\_name}'")

return True

def display\_event\_details(self):

print("Event Details:")

print(f"Event Name: {self.event\_name}")

print(f"Event Date: {self.event\_date}")

print(f"Event Time: {self.event\_time}")

print(f"Venue: {self.venue\_name}")

print(f"Total Seats: {self.total\_seats}")

print(f"Available Seats: {self.available\_seats}")

print(f"Ticket Price: {self.ticket\_price}")

print(f"Event Type: {self.event\_type.value}")

1. **Venue** Class

• **Attributes**:

o venue\_name,

o address

• **Methods and Constuctors:**

o **display\_venue\_details():** Display venue details.

o Implement default constructors and overload the constructor with Customer

attributes, generate getter and setter methods.

class Venue:

def \_\_init\_\_(self, venue\_name, address):

self.venue\_name = venue\_name

self.address = address

def get\_venue\_name(self):

return self.venue\_name

def set\_venue\_name(self, venue\_name):

self.venue\_name = venue\_name

def get\_address(self):

return self.address

def set\_address(self, address):

self.address = address

def display\_venue\_details(self):

print("Venue Details:")

print(f"Venue Name: {self.venue\_name}")

print(f"Address: {self.address}")

1. **Customer** Class

• **Attributes:**

o customer\_name,

o email,

o phone\_number

• **Methods and Constuctors:**

o Implement default constructors and overload the constructor with Customer

attributes, generate getter and setter methods.

o **display\_customer\_details()**: Display customer details.

class Customer:

def \_\_init\_\_(self, customer\_name, email, phone\_number):

self.customer\_name = customer\_name

self.email = email

self.phone\_number = phone\_number

def get\_customer\_name(self):

return self.customer\_name

def set\_customer\_name(self, customer\_name):

self.customer\_name = customer\_name

def get\_email(self):

return self.email

def set\_email(self, email):

self.email = email

def get\_phone\_number(self):

return self.phone\_number

def set\_phone\_number(self, phone\_number):

self.phone\_number = phone\_number

def display\_customer\_details(self):

print("Customer Details:")

print(f"Name: {self.customer\_name}")

print(f"Email: {self.email}")

print(f"Phone Number: {self.phone\_number}")

1. **Booking** Class to represent the Tiket booking system. Perform the following operation in main

method. Note:- Use Event class object for the following operation.

• **Methods and Constuctors:**

o **calculate\_booking\_cost(num\_tickets)**: Calculate and set the total cost of the

booking.

o **book\_tickets(num\_tickets)**: Book a specified number of tickets for an event.

o **cancel\_booking(num\_tickets)**: Cancel the booking and update the available seats.

o **getAvailableNoOfTickets()**: return the total available tickets

o **getEventDetails()**: return event details from the event class

class Booking:

def \_\_init\_\_(self, event):

self.event = event

self.num\_tickets = 0

self.total\_cost = 0

def calculate\_booking\_cost(self, num\_tickets):

self.num\_tickets = num\_tickets

self.total\_cost = self.num\_tickets \* self.event.get\_ticket\_price()

def book\_tickets(self, num\_tickets):

if self.event.book\_tickets(num\_tickets):

self.num\_tickets += num\_tickets

self.total\_cost += num\_tickets \* self.event.get\_ticket\_price()

print(f"{num\_tickets} tickets booked successfully!")

return True

else:

print("Failed to book tickets.")

return False

def cancel\_booking(self, num\_tickets):

if self.event.cancel\_booking(num\_tickets):

self.num\_tickets -= num\_tickets

self.total\_cost -= num\_tickets \* self.event.get\_ticket\_price()

print(f"{num\_tickets} tickets canceled successfully!")

return True

else:

print("Failed to cancel booking.")

return False

def get\_available\_no\_of\_tickets(self):

return self.event.get\_available\_seats()

def get\_event\_details(self):

return self.event.display\_event\_details()

**Task 5: Inheritance and polymorphism**

1. **Inheritance**

• Create a subclass **Movie** that inherits from **Event**. Add the following attributes and methods:

o **Attributes:**

1. genre: Genre of the movie (e.g., Action, Comedy, Horror).

2. ActorName

3. ActresName

o **Methods:**

1. Implement default constructors and overload the constructor with Customer

attributes, generate getter and setter methods.

1. **display\_event\_details():** Display movie details, including genre.

class Movie (Event):

def \_\_init\_\_(self, event\_name, event\_date, event\_time, venue\_name, total\_seats, ticket\_price, genre, actor\_name, actress\_name):

super().\_\_init\_\_(event\_name, event\_date, event\_time, venue\_name, total\_seats, ticket\_price, "Movie")

self.genre = genre

self.actor\_name = actor\_name

self.actress\_name = actress\_name

def display\_event\_details(self):

super().display\_event\_details()

print(f"Genre: {self.genre}")

print(f"Actor Name: {self.actor\_name}")

print(f"Actress Name: {self.actress\_name}")

• Create another subclass **Concert** that inherits from **Event**. Add the following attributes and

methods:

o **Attributes:**

1. artist: Name of the performing artist or band.

2. type: (Theatrical, Classical, Rock, Recital)

o **Methods:**

1. Implement default constructors and overload the constructor with Customer

attributes, generate getter and setter methods.

2. **display\_concert\_details():** Display concert details, including the artist.

class Concert(Event):

def \_\_init\_\_(self, event\_name, event\_date, event\_time, venue\_name, total\_seats, ticket\_price, artist, concert\_type):

super().\_\_init\_\_(event\_name, event\_date, event\_time, venue\_name, total\_seats, ticket\_price, "Concert")

self.artist = artist

self.concert\_type = concert\_type

def display\_event\_details(self):

super().display\_event\_details()

print(f"Artist: {self.artist}")

• Create another subclass **Sports** that inherits from **Event**. Add the following attributes and

methods:

o **Attributes:**

1. sportName: Name of the game.

2. teamsName: (India vs Pakistan)

o **Methods:**

1. Implement default constructors and overload the constructor with Customer

attributes, generate getter and setter methods.

2. **display\_sport\_details():** Display concert details, including the artist.

class Sports(Event):

def \_\_init\_\_(self, event\_name, event\_date, event\_time, venue\_name, total\_seats, ticket\_price, sport\_name, teams\_name):

super().\_\_init\_\_(event\_name, event\_date, event\_time, venue\_name, total\_seats, ticket\_price, "Sports")

self.sport\_name = sport\_name

self.teams\_name = teams\_name

def display\_event\_details(self):

super().display\_event\_details()

print(f"Sport Name: {self.sport\_name}")

• Create a class **TicketBookingSystem** with the following methods:

o **create\_event(event\_name: str, date:str, time:str, total\_seats: int, ticket\_price:**

**float, event\_type: str, venu\_name:str):** Create a new event with the specified details

and event type (movie, sport or concert) and return event object.

o **display\_event\_details(event: Event)**: Accepts an event object and calls its

**display\_event\_details()** method to display event details.

o **book\_tickets(event: Event, num\_tickets: int):**

1. Accepts an event object and the number of tickets to be booked.

2. Checks if there are enough available seats for the booking.

3. If seats are available, updates the available seats and returns the total cost

of the booking.

4. If seats are not available, displays a message indicating that the event is sold

out.

o **cancel\_tickets(event: Event, num\_tickets)**: cancel a specified number of tickets for

an event.

o **main():** simulates the ticket booking system

1. User can book tickets and view the event details as per their choice in menu

(movies, sports, concerts).

2. Display event details using the display\_event\_details() method without

knowing the specific event type (demonstrate polymorphism).

3. Make bookings using the book\_tickets() and cancel tickets cancel\_tickets()

method.

class TicketBookingSystem:

events = []

@classmethod

def create\_event(cls, event\_name, event\_date, event\_time, venue\_name, total\_seats, ticket\_price, event\_type):

if event\_type.lower() == "movie":

genre = input("Enter movie genre: ")

actor\_name = input("Enter actor name: ")

actress\_name = input("Enter actress name: ")

event = Movie(event\_name, event\_date, event\_time, venue\_name, total\_seats, ticket\_price, genre, actor\_name, actress\_name)

elif event\_type.lower() == "concert":

artist = input("Enter artist name: ")

concert\_type = input("Enter concert type: ")

event = Concert(event\_name, event\_date, event\_time, venue\_name, total\_seats, ticket\_price, artist, concert\_type)

elif event\_type.lower() == "sports":

sport\_name = input("Enter sport name: ")

teams\_name = input("Enter teams name: ")

event = Sports(event\_name, event\_date, event\_time, venue\_name, total\_seats, ticket\_price, sport\_name, teams\_name)

else:

print("Invalid event type.")

return None

cls.events.append(event)

return event

@classmethod

def display\_event\_details(cls, event):

event.display\_event\_details()

@classmethod

def book\_tickets(cls, event, num\_tickets):

if event.book\_tickets(num\_tickets):

print(f"{num\_tickets} tickets booked successfully!")

return event.calculate\_total\_revenue(num\_tickets)

else:

print("Failed to book tickets.")

return 0

@classmethod

def cancel\_tickets(cls, event, num\_tickets):

if event.cancel\_booking(num\_tickets):

print(f"{num\_tickets} tickets canceled successfully!")

return True

else:

print("Failed to cancel tickets.")

return False

@classmethod

def main(cls):

while True:

print("\n1. Create Event\n2. Display Event Details\n3. Book Tickets\n4. Cancel Tickets\n5. Exit")

choice = input("Enter your choice: ")

if choice == "1":

event\_name = input("Enter event name: ")

event\_date = input("Enter event date: ")

event\_time = input("Enter event time: ")

total\_seats = int(input("Enter total seats: "))

ticket\_price = float(input("Enter ticket price: "))

event\_type = input("Enter event type (movie/concert/sports): ")

venue\_name = input("Enter venue name: ")

cls.create\_event(event\_name, event\_date, event\_time, venue\_name, total\_seats, ticket\_price, event\_type)

elif choice == "2":

if cls.events:

for index, event in enumerate(cls.events, start=1):

print(f"\nEvent {index}:")

cls.display\_event\_details(event)

else:

print("No events created yet.")

elif choice == "3":

if cls.events:

event\_index = int(input("Enter event index to book tickets: ")) - 1

if 0 <= event\_index < len(cls.events):

event = cls.events[event\_index]

num\_tickets = int(input("Enter number of tickets to book:"))

cls.book\_tickets(event, num\_tickets)

else:

print("Invalid event index.")

else:

print("No events created yet.")

elif choice == "4":

if cls.events:

event\_index = int(input("Enter event index to cancel tickets: ")) - 1

if 0 <= event\_index < len(cls.events):

event = cls.events[event\_index]

num\_tickets = int(input("Enter number of tickets to cancel:"))

cls.cancel\_tickets(event, num\_tickets)

else:

print("Invalid event index.")

else:

print("No events created yet.")

elif choice == "5":

print("Exiting program.")

break

else:

print("Invalid choice. Please try again.")

**Task 6: Abstraction**

**Requirements:**

1. **Event Abstraction:**

• Create an abstract class **Event** that represents a generic event. It should include the

following attributes and methods as mentioned in *TASK 1*:

from abc import ABC, abstractmethod

# Abstract

class Event(ABC):

def \_\_init\_\_(self, event\_name, event\_date, event\_time, venue\_name, total\_seats, ticket\_price, event\_type):

self.event\_name = event\_name

self.event\_date = event\_date

self.event\_time = event\_time

self.venue\_name = venue\_name

self.total\_seats = total\_seats

self.available\_seats = total\_seats

self.ticket\_price = ticket\_price

self.event\_type = event\_type

@abstractmethod

def display\_event\_details(self):

pass

@abstractmethod

def calculate\_total\_revenue(self, num\_tickets):

pass

@abstractmethod

def book\_tickets(self, num\_tickets):

pass

@abstractmethod

def cancel\_booking(self, num\_tickets):

pass

**2.** Concrete **Event** Classes**:**

• Create three concrete classes that inherit from **Event** abstract class and override abstract

methods in concrete class should declare the variables as mentioned in above *Task 2*:

• Movie.

• Concert.

• Sport.

class Movie(Event):

def \_\_init\_\_(self, event\_name, event\_date, event\_time, venue\_name, total\_seats, ticket\_price, genre, actor\_name, actress\_name):

super().\_\_init\_\_(event\_name, event\_date, event\_time, venue\_name, total\_seats, ticket\_price, event\_type="Movie")

self.genre = genre

self.actor\_name = actor\_name

self.actress\_name = actress\_name

def display\_event\_details(self):

print(f"Event Name: {self.event\_name}")

print(f"Event Date: {self.event\_date}")

print(f"Event Time: {self.event\_time}")

print(f"Venue: {self.venue\_name}")

print(f"Total Seats: {self.total\_seats}")

print(f"Available Seats: {self.available\_seats}")

print(f"Ticket Price: {self.ticket\_price}")

print(f"Event Type: {self.event\_type}")

print(f"Genre: {self.genre}")

print(f"Actor: {self.actor\_name}")

print(f"Actress: {self.actress\_name}")

def calculate\_total\_revenue(self, num\_tickets):

return num\_tickets \* self.ticket\_price

def book\_tickets(self, num\_tickets):

if self.available\_seats >= num\_tickets:

self.available\_seats -= num\_tickets

return True

else:

return False

def cancel\_booking(self, num\_tickets):

self.available\_seats += num\_tickets

return True

class Concert(Event):

def \_\_init\_\_(self, event\_name, event\_date, event\_time, venue\_name, total\_seats, ticket\_price, artist, concert\_type):

super().\_\_init\_\_(event\_name, event\_date, event\_time, venue\_name, total\_seats, ticket\_price, event\_type="Concert")

self.artist = artist

self.concert\_type = concert\_type

def display\_event\_details(self):

print(f"Event Name: {self.event\_name}")

print(f"Event Date: {self.event\_date}")

print(f"Event Time: {self.event\_time}")

print(f"Venue: {self.venue\_name}")

print(f"Total Seats: {self.total\_seats}")

print(f"Available Seats: {self.available\_seats}")

print(f"Ticket Price: {self.ticket\_price}")

print(f"Event Type: {self.event\_type}")

print(f"Artist: {self.artist}")

print(f"Concert Type: {self.concert\_type}")

def calculate\_total\_revenue(self, num\_tickets):

return num\_tickets \* self.ticket\_price

def book\_tickets(self, num\_tickets):

if self.available\_seats >= num\_tickets:

self.available\_seats -= num\_tickets

return True

else:

return False

def cancel\_booking(self, num\_tickets):

self.available\_seats += num\_tickets

return True

class Sport(Event):

def \_\_init\_\_(self, event\_name, event\_date, event\_time, venue\_name, total\_seats, ticket\_price, sport\_name, teams\_name):

super().\_\_init\_\_(event\_name, event\_date, event\_time, venue\_name, total\_seats, ticket\_price, event\_type="Sports")

self.sport\_name = sport\_name

self.teams\_name = teams\_name

def display\_event\_details(self):

print(f"Event Name: {self.event\_name}")

print(f"Event Date: {self.event\_date}")

print(f"Event Time: {self.event\_time}")

print(f"Venue: {self.venue\_name}")

print(f"Total Seats: {self.total\_seats}")

print(f"Available Seats: {self.available\_seats}")

print(f"Ticket Price: {self.ticket\_price}")

print(f"Event Type: {self.event\_type}")

print(f"Sport: {self.sport\_name}")

print(f"Teams: {self.teams\_name}")

def calculate\_total\_revenue(self, num\_tickets):

return num\_tickets \* self.ticket\_price

def book\_tickets(self, num\_tickets):

if self.available\_seats >= num\_tickets:

self.available\_seats -= num\_tickets

return True

else:

return False

def cancel\_booking(self, num\_tickets):

self.available\_seats += num\_tickets

return True

1. **BookingSystem** Abstraction:

• Create an abstract class **BookingSystem** that represents the ticket booking system. It should include the methods of TASK 2 **TicketBookingSystem**:

class BookingSystem(ABC):

events = []

@abstractmethod

def create\_event(self, event\_name, event\_date, event\_time, total\_seats, ticket\_price, event\_type, venue\_name):

pass

@abstractmethod

def book\_tickets(self, event, num\_tickets):

pass

@abstractmethod

def cancel\_tickets(self, event, num\_tickets):

pass

@abstractmethod

def get\_available\_seats(self, event):

pass

1. Concrete **TicketBookingSystem** Class:

• Create a concrete class **TicketBookingSystem** that inherits from BookingSystem:

• **TicketBookingSystem**: Implement the abstract methods to create events, book

tickets, and retrieve available seats. Maintain an array of events in this class.

• Create a simple user interface in a main method that allows users to interact with the ticket

booking system by entering commands such as "create\_event", "book\_tickets",

"cancel\_tickets", "get\_available\_seats," and "exit."

class TicketBookingSystem(BookingSystem):

def create\_event(self, event\_name, event\_date, event\_time, total\_seats, ticket\_price, event\_type, venue\_name):

if event\_type == "Movie":

genre = input("Enter genre: ")

actor\_name = input("Enter actor name: ")

actress\_name = input("Enter actress name: ")

event = Movie(event\_name, event\_date, event\_time, venue\_name, total\_seats, ticket\_price, genre, actor\_name, actress\_name)

elif event\_type == "Concert":

artist = input("Enter artist name: ")

concert\_type = input("Enter concert type: ")

event = Concert(event\_name, event\_date, event\_time, venue\_name, total\_seats, ticket\_price, artist, concert\_type)

elif event\_type == "Sports":

sport\_name = input("Enter sport name: ")

teams\_name = input("Enter teams playing: ")

event = Sport(event\_name, event\_date, event\_time, venue\_name, total\_seats, ticket\_price, sport\_name, teams\_name)

else:

print("Invalid event type!")

return None

self.events.append(event)

return event

def book\_tickets(self, event, num\_tickets):

if event.book\_tickets(num\_tickets):

print(f"{num\_tickets} tickets booked successfully!")

return event.calculate\_total\_revenue(num\_tickets)

else:

print("Failed to book tickets.")

return 0

def cancel\_tickets(self, event, num\_tickets):

if event.cancel\_booking(num\_tickets):

print(f"{num\_tickets} tickets canceled successfully!")

return True

else:

print("Failed to cancel tickets.")

return False

def get\_available\_seats(self, event):

return event.available\_seats