Control structure

Task 1:

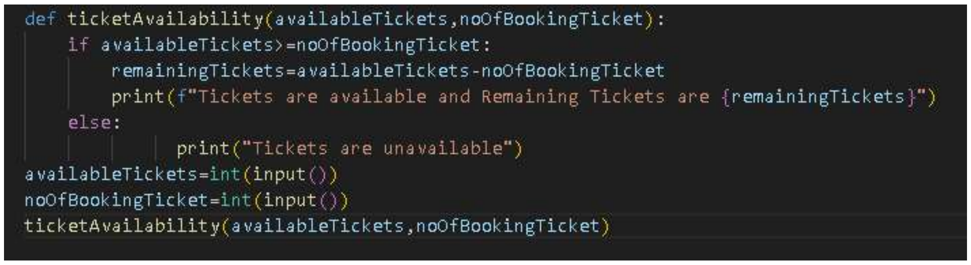
Conditional Statements In a BookingSystem, you have been given the task is to create a program to book tickets. if available tickets more than noOfTicket to book then display the remaining tickets or ticket unavailable:

Tasks:

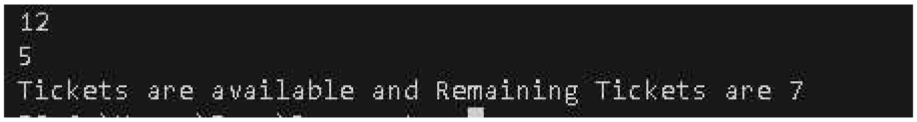
1. Write a program that takes the availableTicket and noOfBookingTicket as input.

2. Use conditional statements (if-else) to determine if the ticket is available or not.

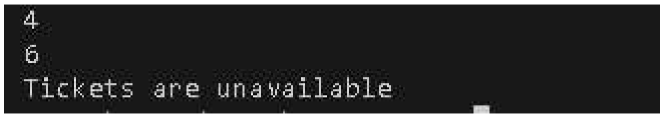
3. Display an appropriate message based on ticket availability.



```python
def ticketAvailability(availableTickets,noOfBookingTicket):
    if availableTickets>=noOfBookingTicket:
        remainingTickets=availableTickets-noOfBookingTicket
        print(f"Tickets are available and Remaining Tickets are {remainingTickets}")
    else:
                print("Tickets are unavailable")
availableTickets=int(input())
noOfBookingTicket=int(input())
ticketAvailability(availableTickets,noOfBookingTicket)
```



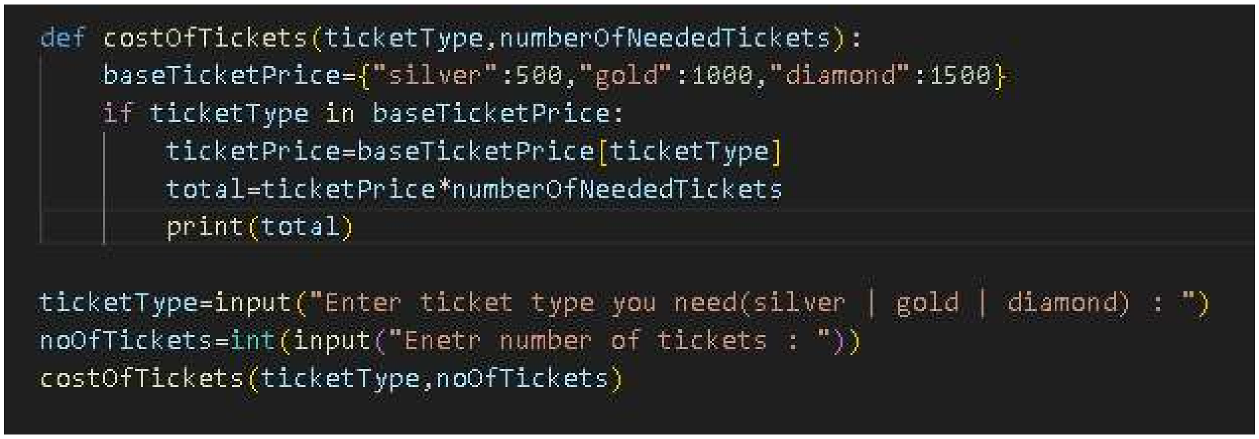
```
12
5
Tickets are available and Remaining Tickets are 7
```



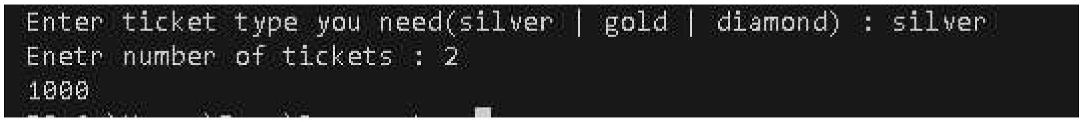
```
4
6
Tickets are unavailable
```

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.



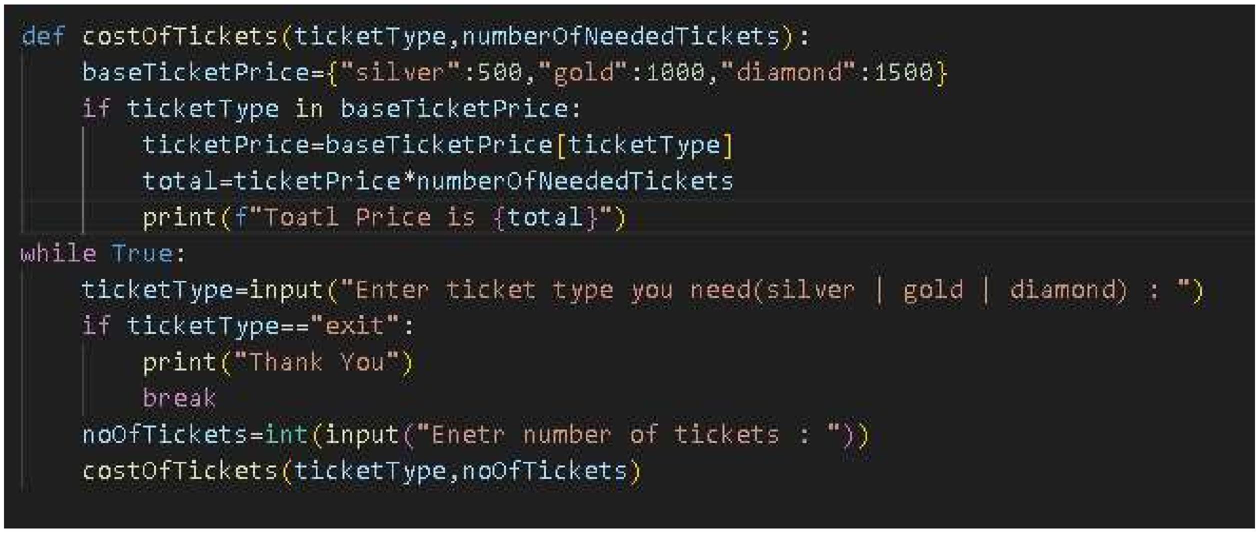
```
def costOfTickets(ticketType,numberOfNeededTickets):
    baseTicketPrice={"silver":500,"gold":1000,"diamond":1500}
    if ticketType in baseTicketPrice:
        ticketPrice=baseTicketPrice[ticketType]
        total=ticketPrice*numberOfNeededTickets
        print(total)

ticketType=input("Enter ticket type you need(silver | gold | diamond) : ")
noOfTickets=int(input("Enetr number of tickets : "))
costOfTickets(ticketType,noOfTickets)
```



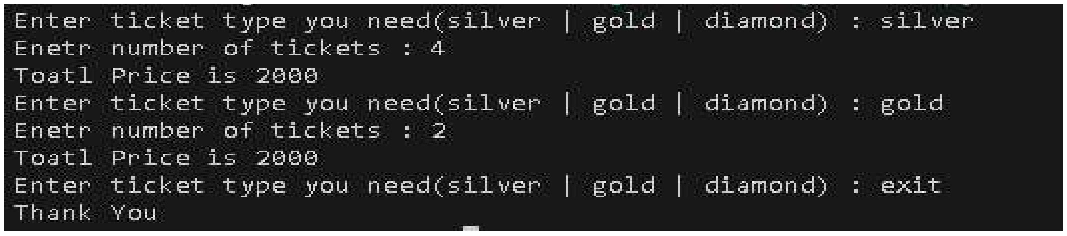
```
Enter ticket type you need(silver | gold | diamond) : silver
Enetr number of tickets : 2
1000
```

Task 3:

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



```
def costOfTickets(ticketType,numberOfNeededTickets):
    baseTicketPrice={"silver":500,"gold":1000,"diamond":1500}
    if ticketType in baseTicketPrice:
        ticketPrice=baseTicketPrice[ticketType]
        total=ticketPrice*numberOfNeededTickets
        print(f"Toatl Price is {total}")
while True:
    ticketType=input("Enter ticket type you need(silver | gold | diamond) : ")
    if ticketType=="exit":
        print("Thank You")
        break
    noOfTickets=int(input("Enetr number of tickets : "))
    costOfTickets(ticketType,noOfTickets)
```



```
Enter ticket type you need(silver | gold | diamond) : silver
Enetr number of tickets : 4
Toatl Price is 2000
Enter ticket type you need(silver | gold | diamond) : gold
Enetr number of tickets : 2
Toatl Price is 2000
Enter ticket type you need(silver | gold | diamond) : exit
Thank You
```

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.

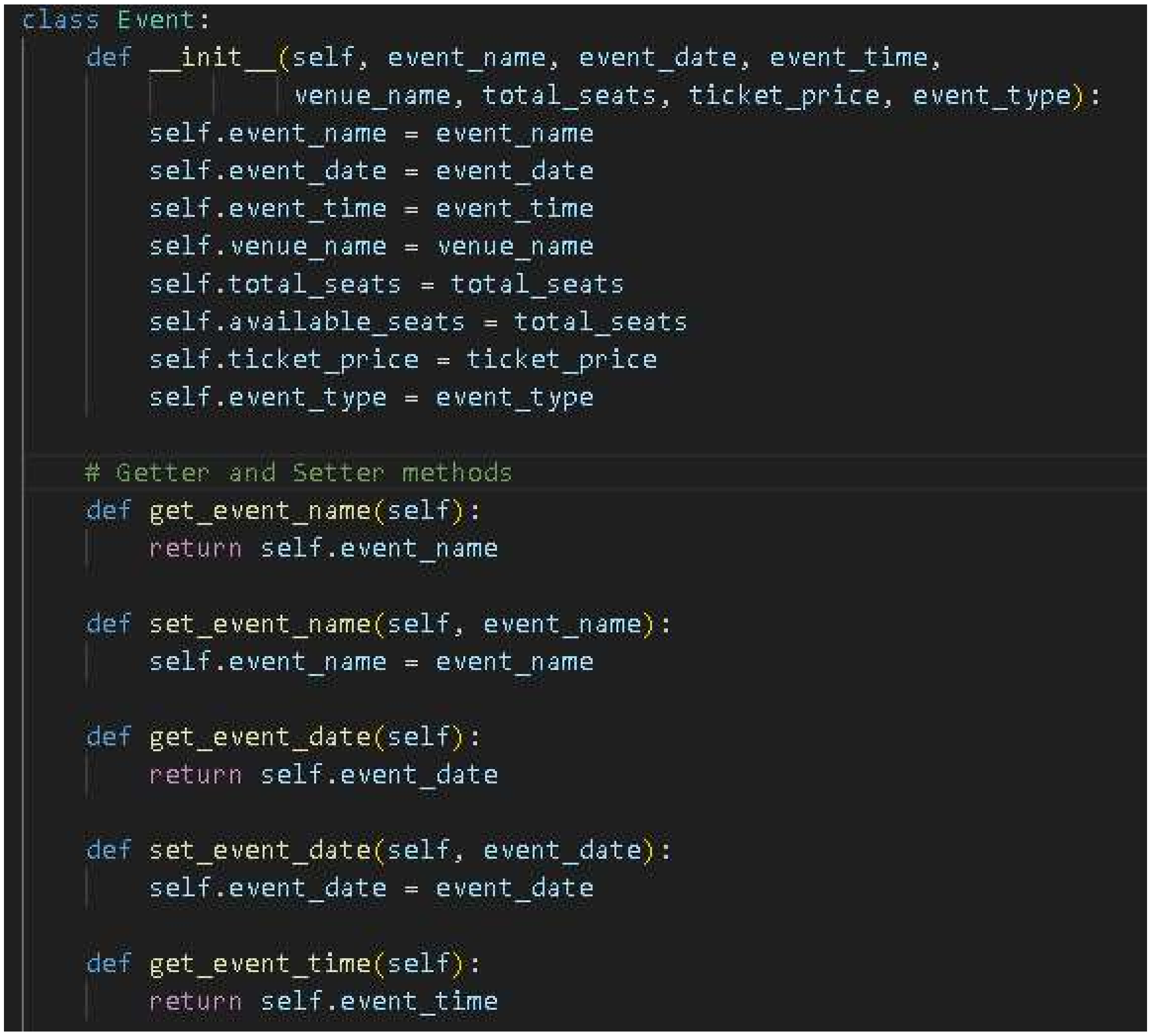
o **calculate_total_revenue()**: Calculate and return the total revenue based on the number of tickets sold

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

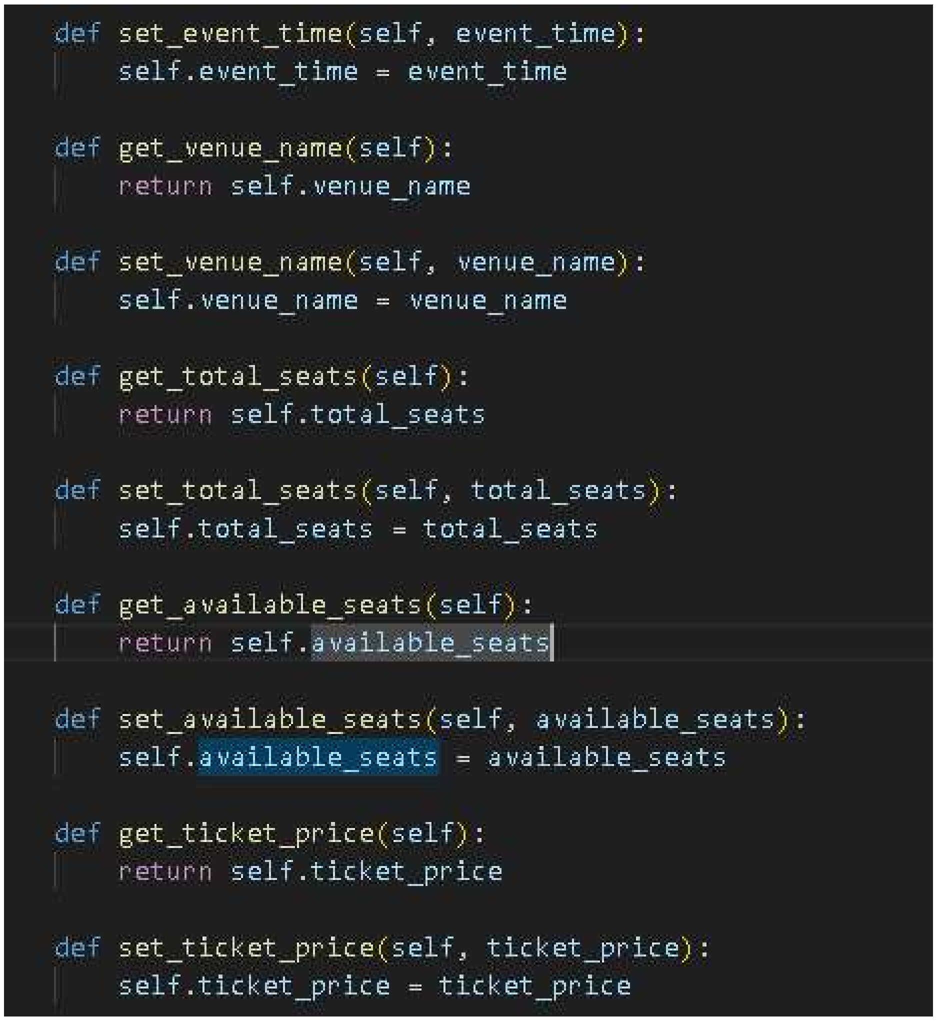
o **book_tickets(num_tickets)**: Book a specified number of tickets for an event. Initially available seats are equal to the total seats when tickets are booked available seats number should be reduced.

o **cancel_booking(num_tickets)**: Cancel the booking and update the available seats.

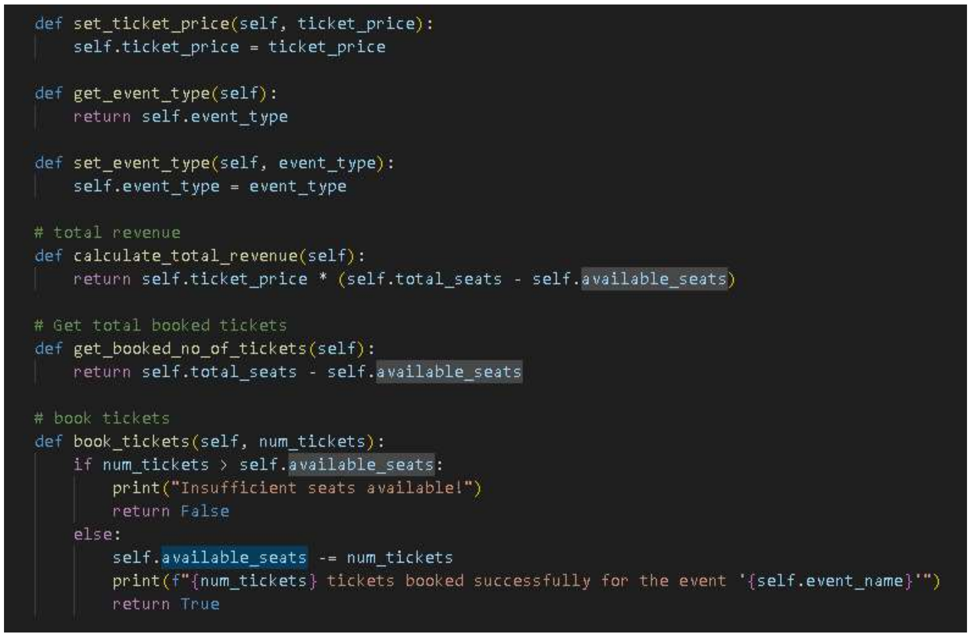
o **display_event_details()**: Display event details, including event name, date time seat availability.



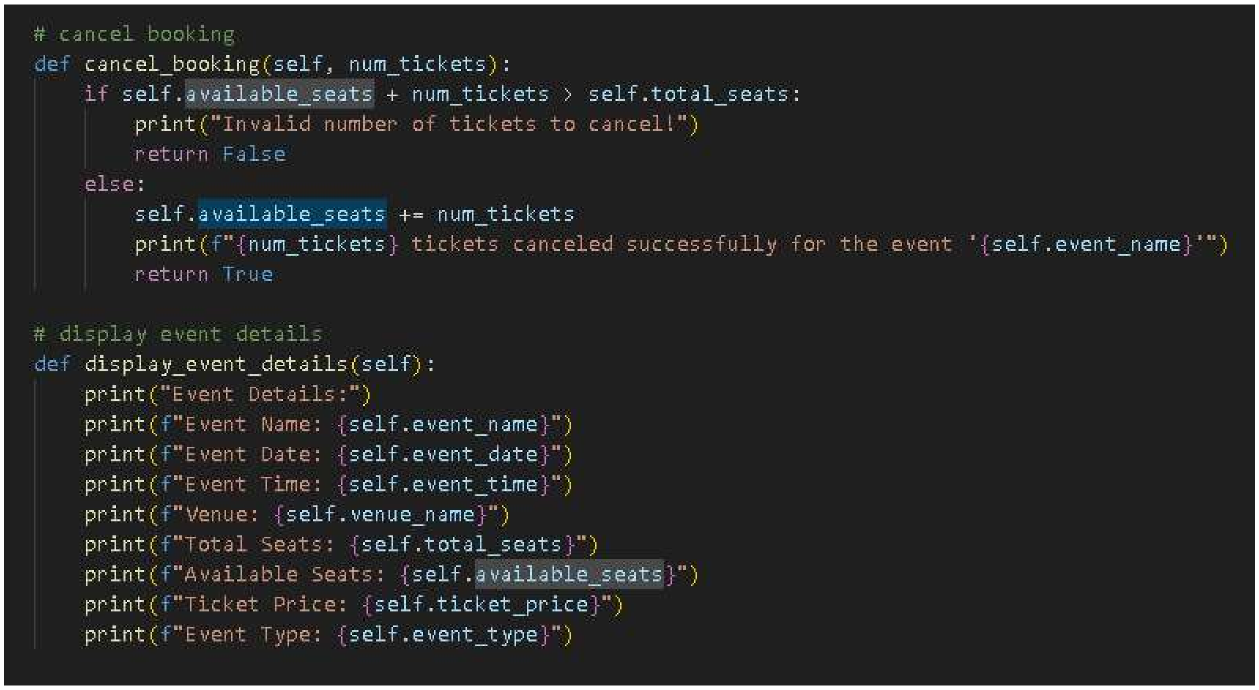
```python
class Event:
    def __init__(self, event_name, event_date, event_time,
                 venue_name, total_seats, ticket_price, event_type):
        self.event_name = event_name
        self.event_date = event_date
        self.event_time = event_time
        self.venue_name = venue_name
        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
```



```python
    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
```



```python
    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

    # total revenue
    def calculate_total_revenue(self):
        return self.ticket_price * (self.total_seats - self.available_seats)

    # Get total booked tickets
    def get_booked_no_of_tickets(self):
        return self.total_seats - self.available_seats

    # book tickets
    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
```



```python
# cancel booking
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

# display event details
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}")
```

2. Venue Class

• **Attributes:**

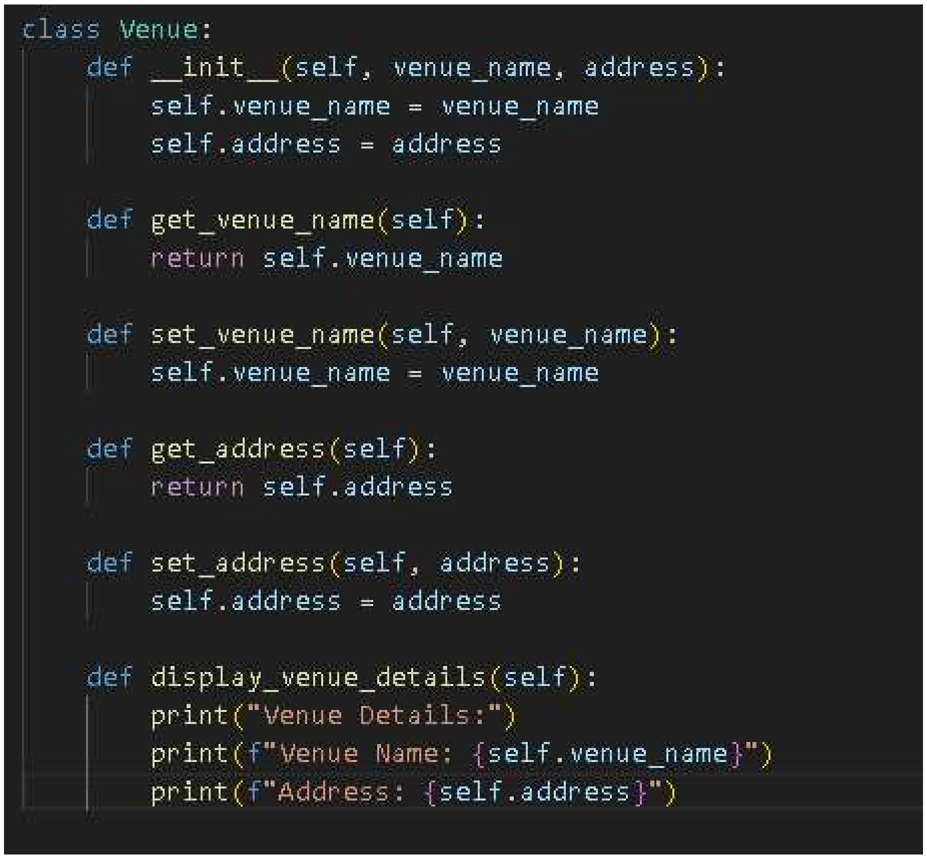
o venue_name,

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.



```python
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}")
```

3. Customer Class

• **Attributes:**

o customer_name,

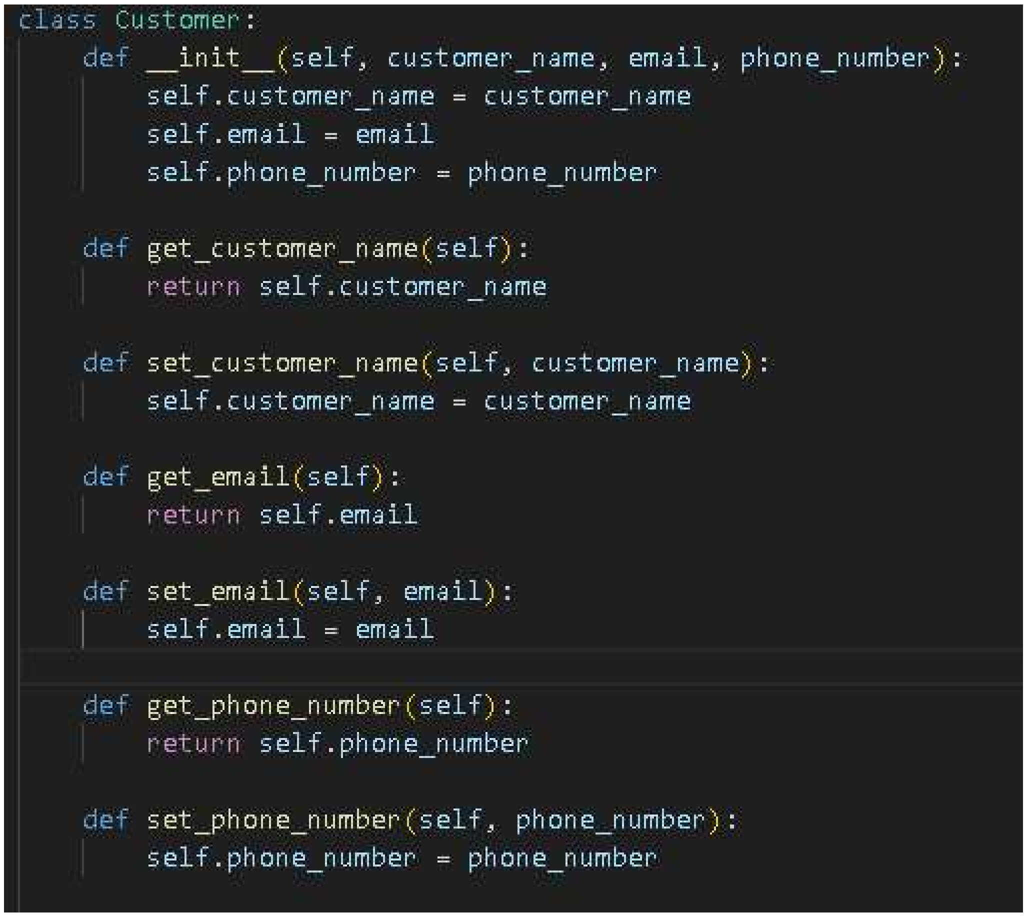
o email,

o phone_number,

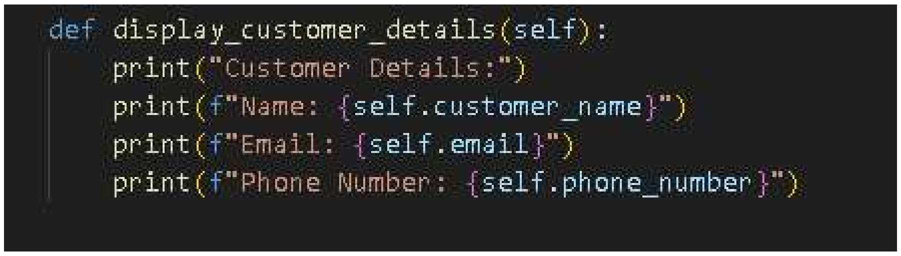
• **Methods and Constuctors:**

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}")
```

4. 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:**

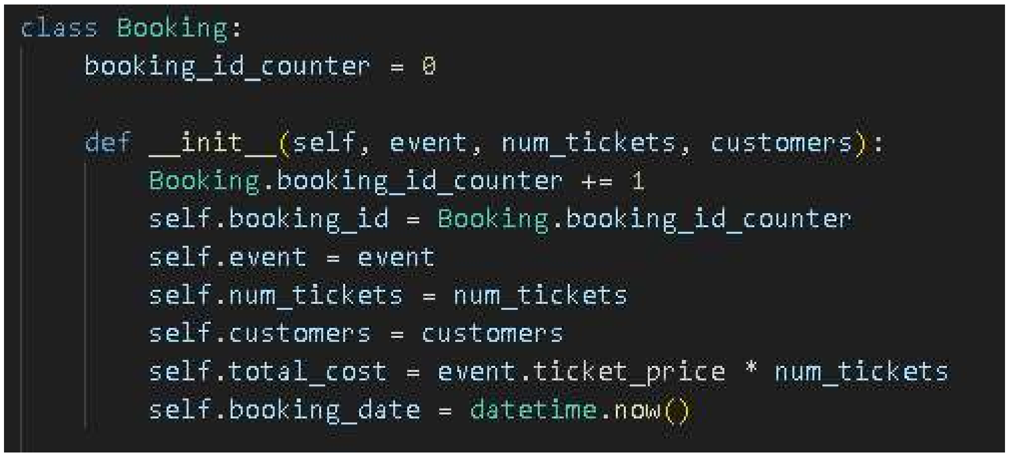
o **calculate_booking_cost(num_tickets)**: Calculate and set the total cost of the booking.

o **book_tickets(num_tickets)**: Book a specified number of tickets for an event.

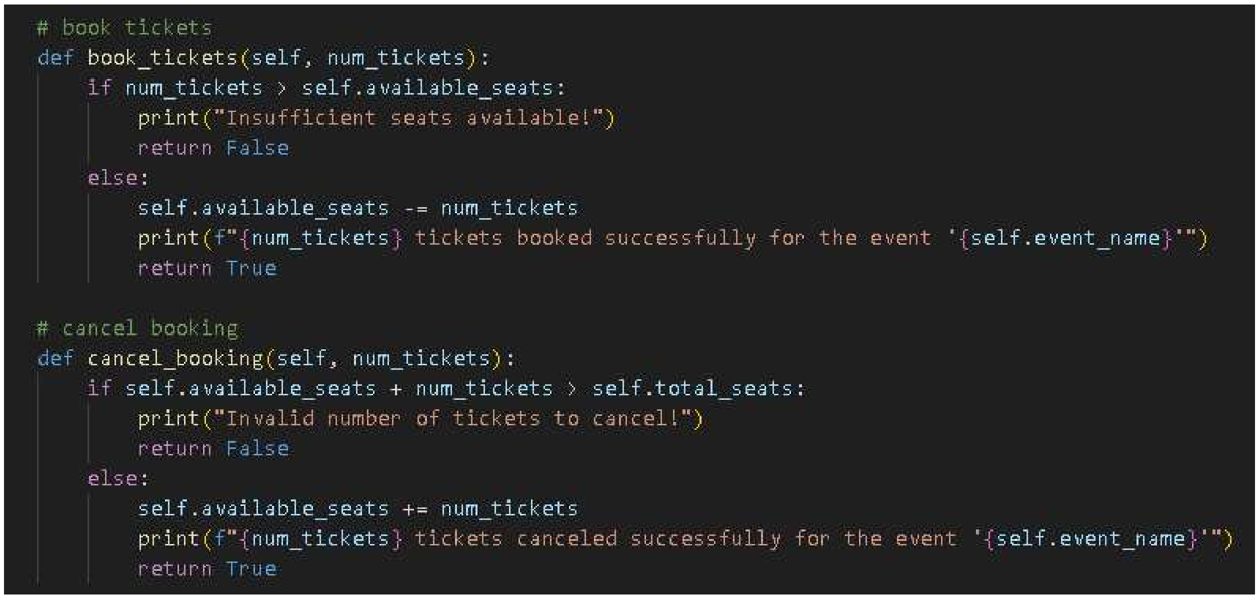
o **cancel_booking(num_tickets)**: Cancel the booking and update the available seats.

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

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



```python
class Booking:
    booking_id_counter = 0

    def __init__(self, event, num_tickets, customers):
        Booking.booking_id_counter += 1
        self.booking_id = Booking.booking_id_counter
        self.event = event
        self.num_tickets = num_tickets
        self.customers = customers
        self.total_cost = event.ticket_price * num_tickets
        self.booking_date = datetime.now()
```



```python
    # book tickets
    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

    # cancel booking
    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
```

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).

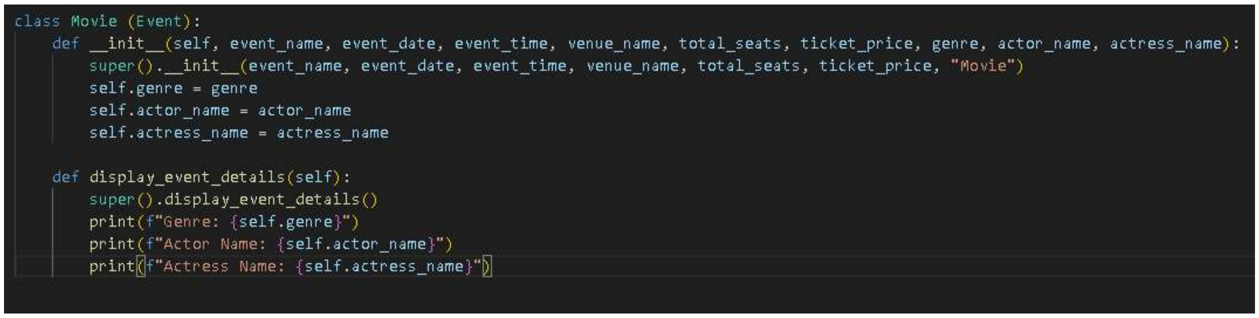
2. ActorName

3. ActresName

o **Methods:**

1. Implement default constructors and overload the constructor with Customer attributes, generate getter and setter methods.

2. 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:**

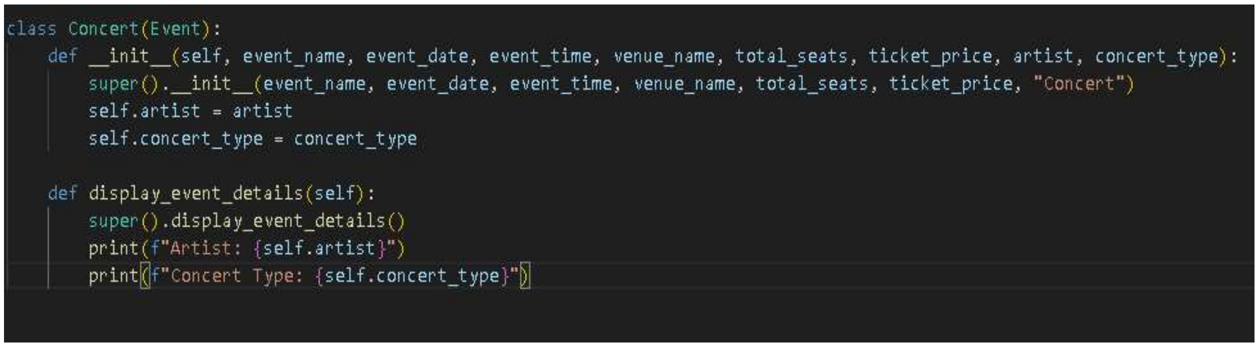
1. artist: Name of the performing artist or band.

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}")
        print(f"Concert Type: {self.concert_type}")
```

• Create another subclass Sports that inherits from Event.

Add the following attributes and methods:

o **Attributes**

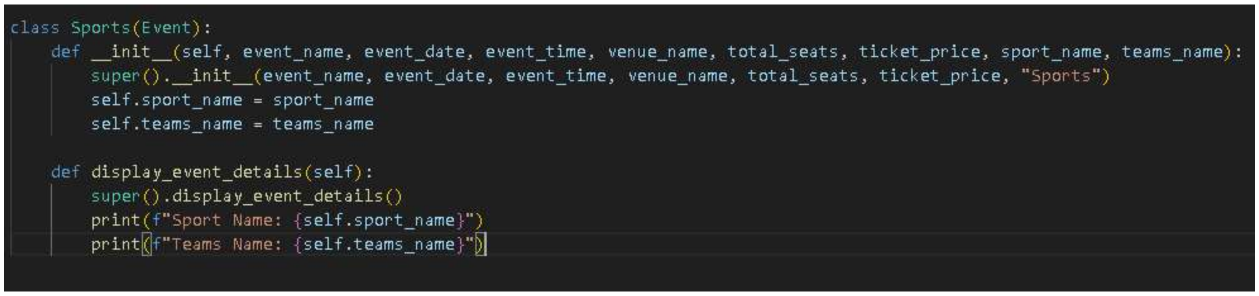
1. sportName: Name of the game.

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.



```python
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}")
        print(f"Teams Name: {self.teams_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.

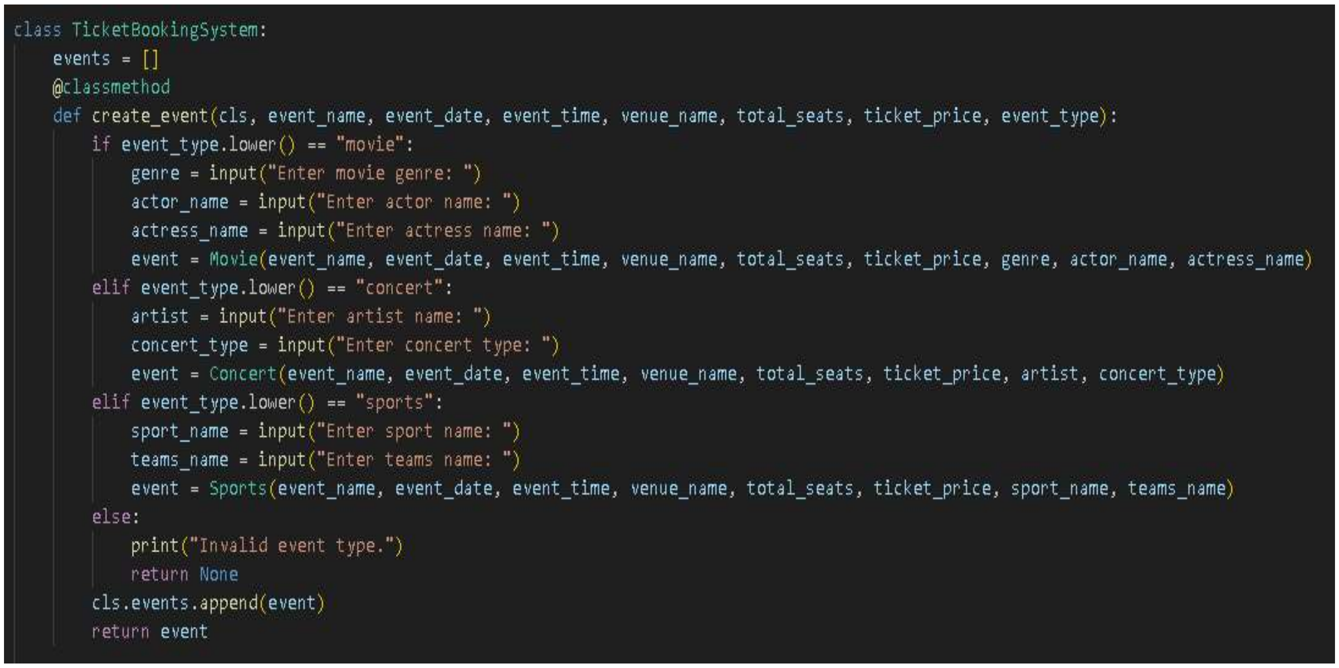
4. If seats are not available, displays a message indicating that the event is sold out. o cancel_tickets(event: Event, num_tickets): cancel a specified number of tickets for an event.

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

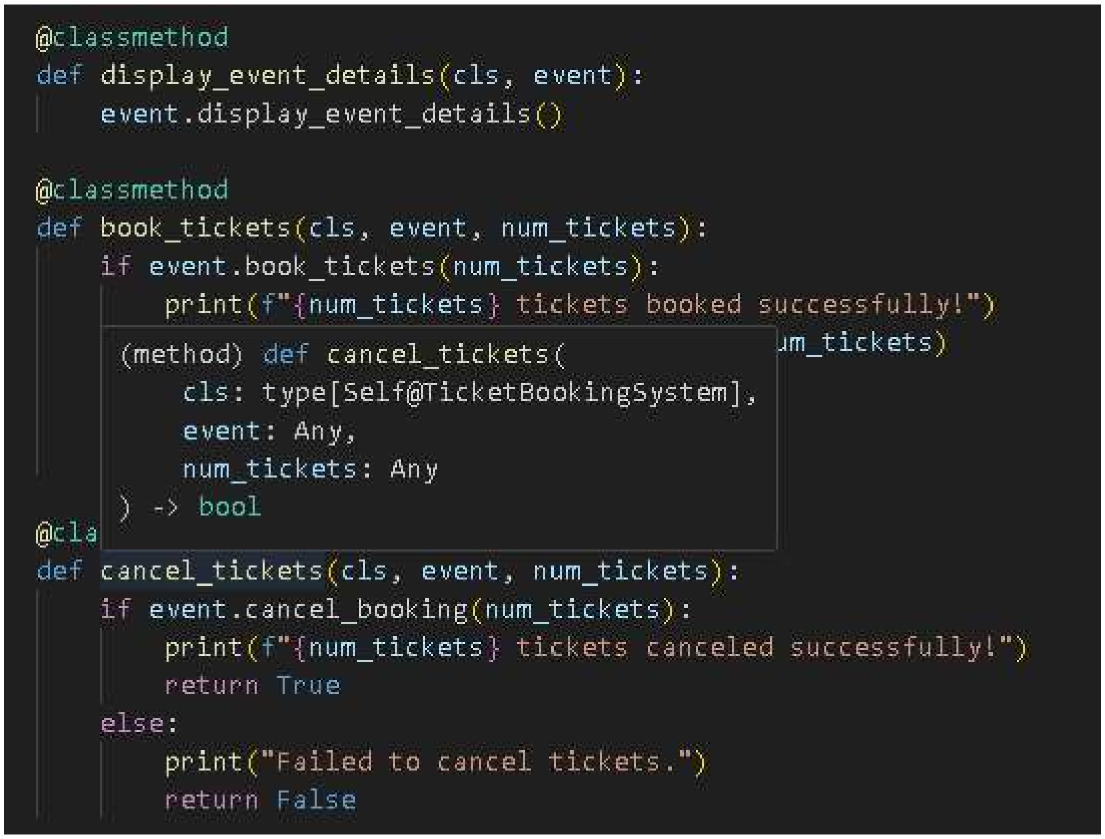
1. User can book tickets and view the event details as per their choice in menu (movies, sports, concerts).

2. Display event details using the display_event_details() method without knowing the specific event type (demonstrate polymorphism).

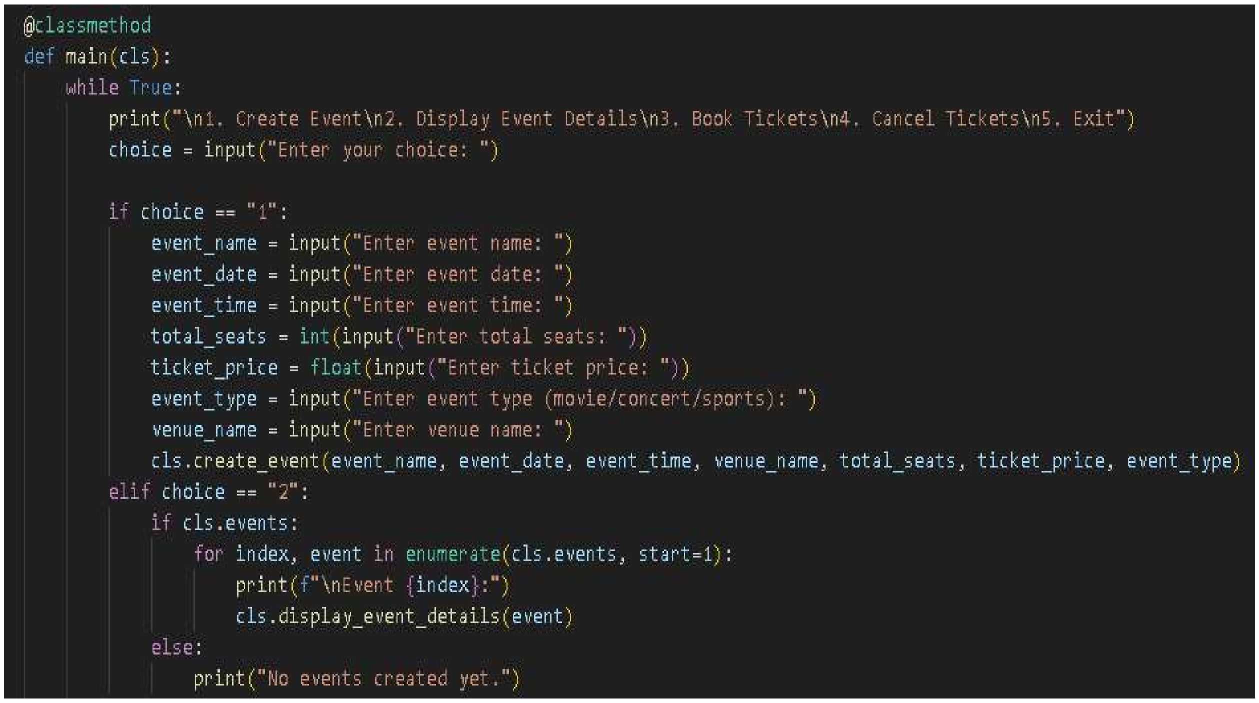
3. Make bookings using the book_tickets() and cancel tickets cancel_tickets() method.



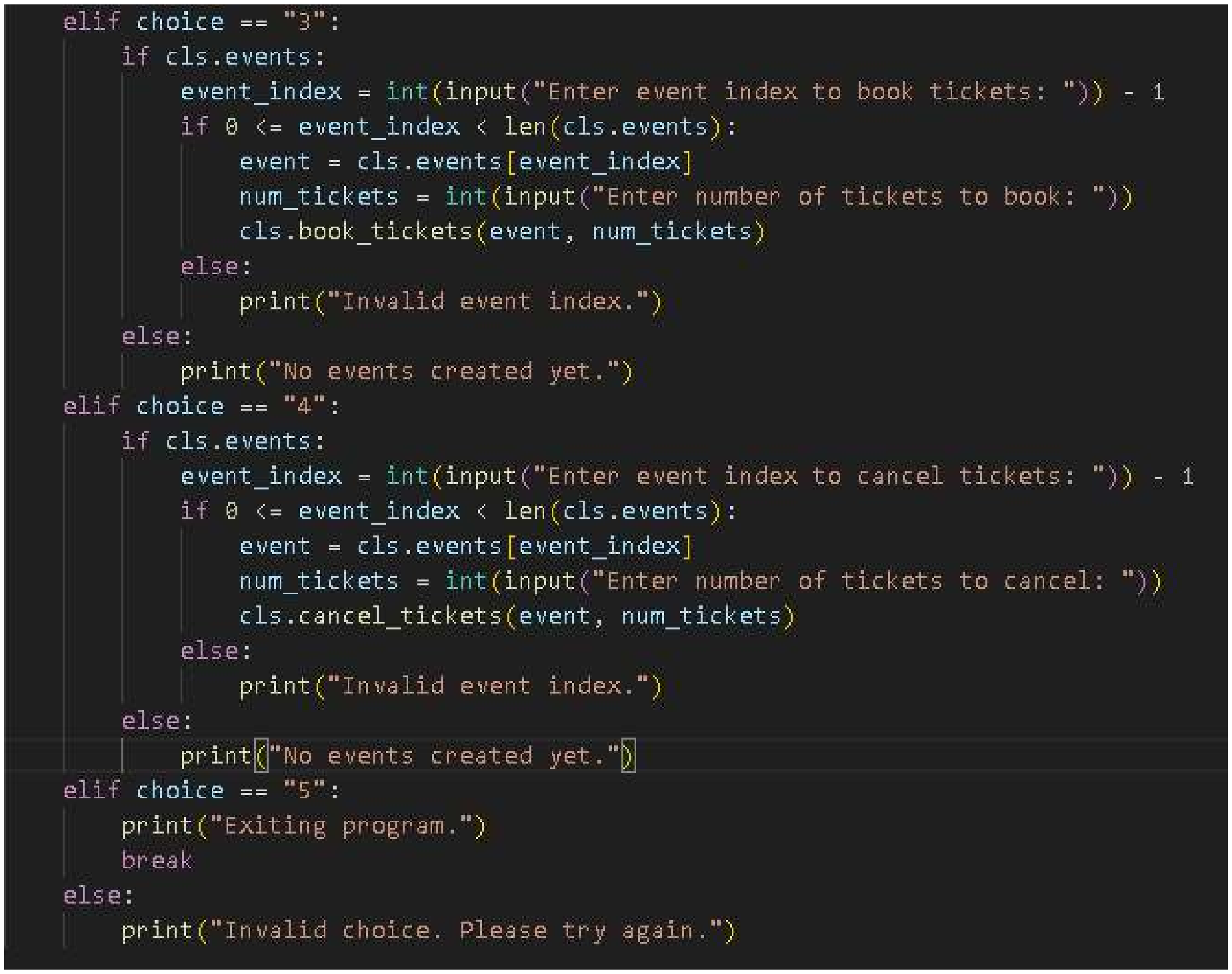
```python
class TicketBookingSystem:
    events = []
    @classmethod
    def create_event(cls, event_name, event_date, event_time, venue_name, total_seats, ticket_price, event_type):
        if event_type.lower() == "movie":
            genre = input("Enter movie genre: ")
            actor_name = input("Enter 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
```



```python
    @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!")
          (method) def cancel_tickets(             um_tickets)
              cls: type[Self@TicketBookingSystem],
              event: Any,
              num_tickets: Any
          ) -> bool
    @cla
    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
```



```python
@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.")
```



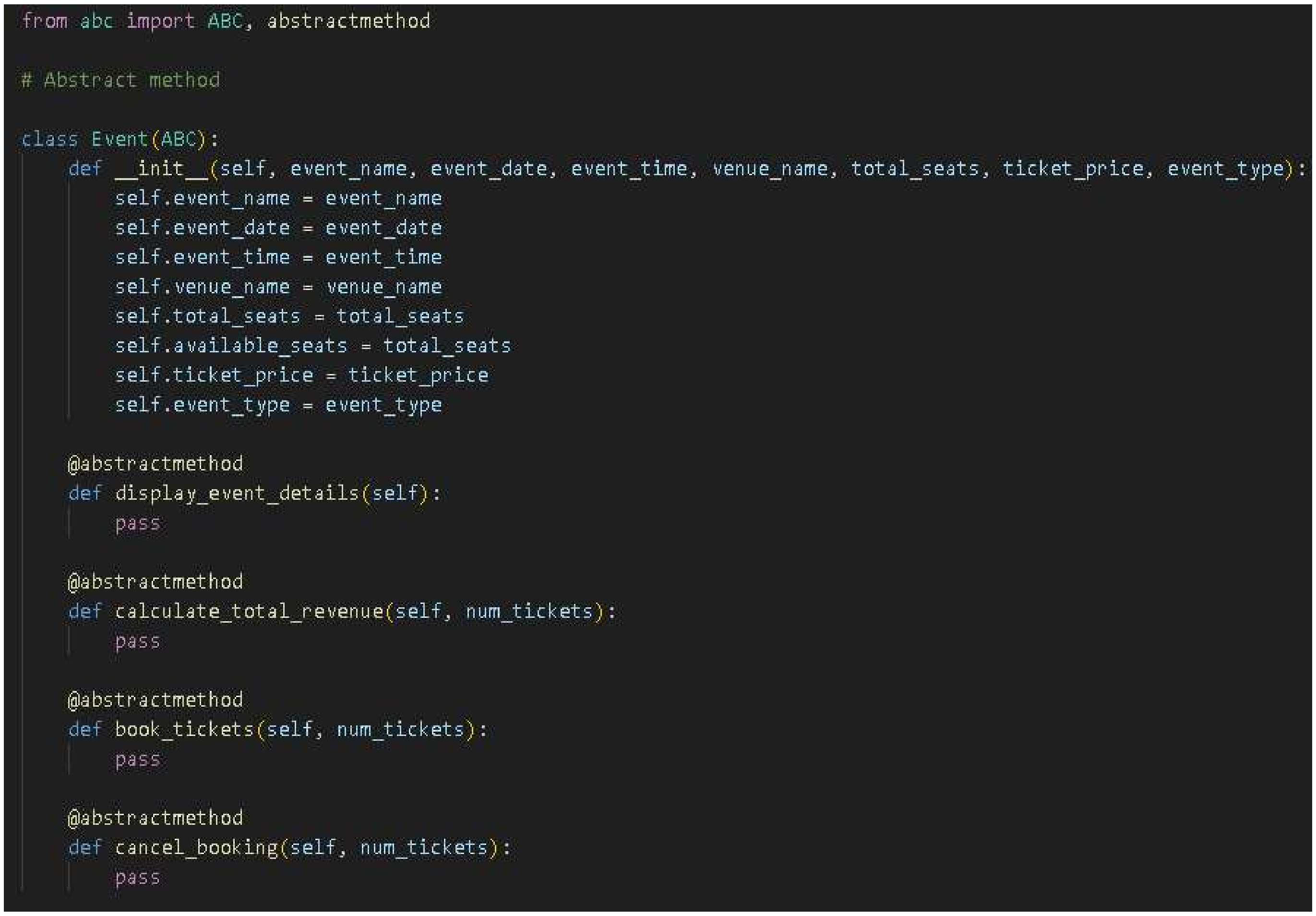
```python
        elif choice == "3":
            if cls.events:
                event_index = int(input("Enter event index to book tickets: ")) - 1
                if 0 <= event_index < len(cls.events):
                    event = cls.events[event_index]
                    num_tickets = int(input("Enter 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:



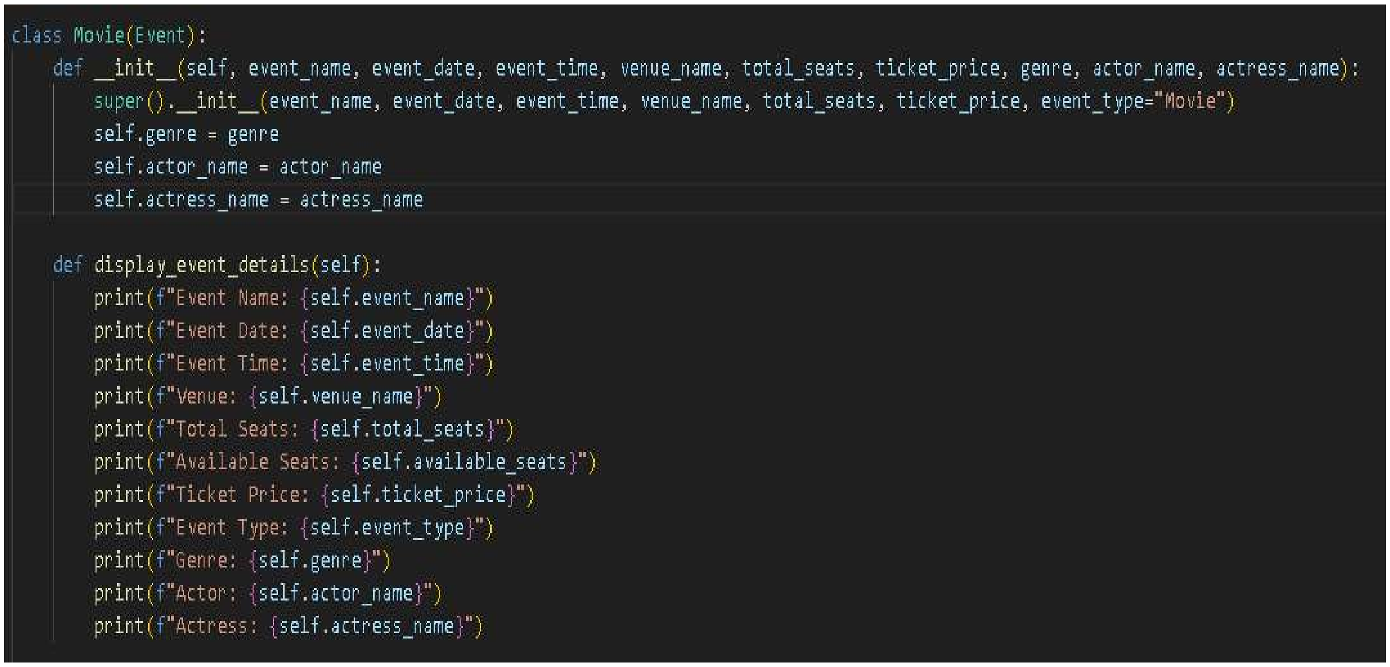
```python
from abc import ABC, abstractmethod

# Abstract method

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:

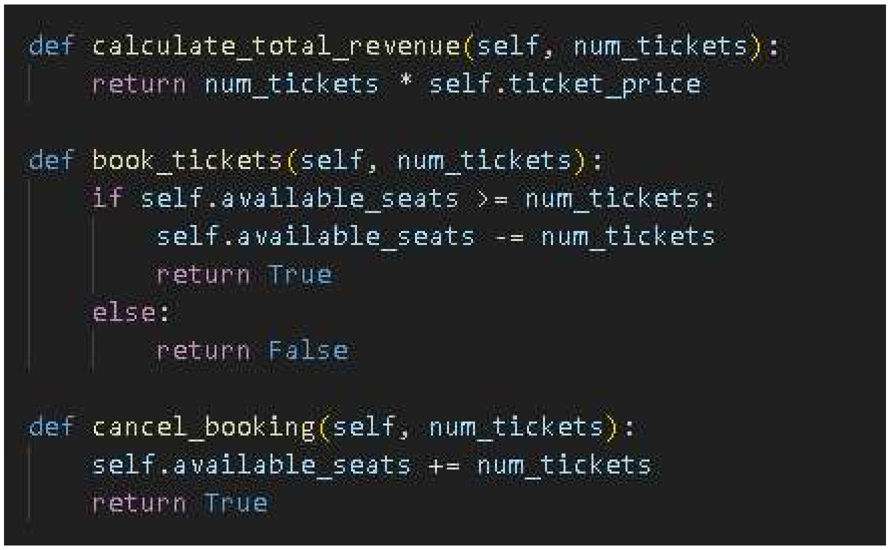
• Movie.

• Concert.

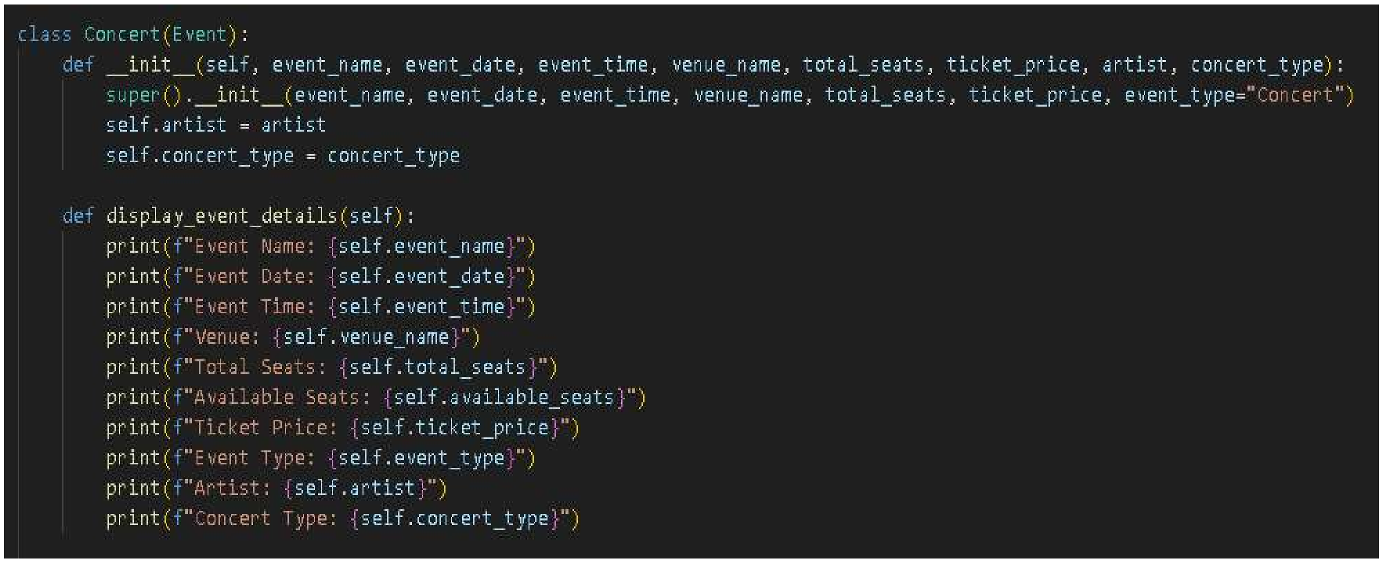
• Sport.



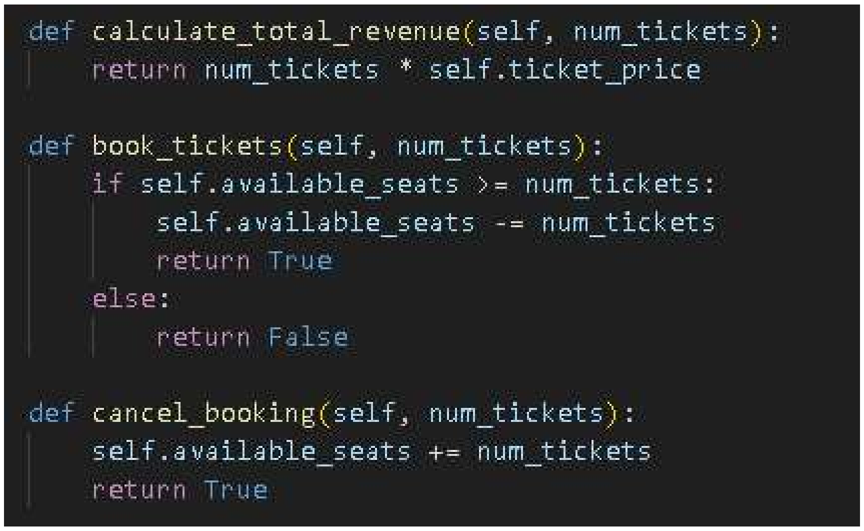
```python
class Movie(Event):
    def __init__(self, event_name, event_date, event_time, venue_name, total_seats, ticket_price, genre, actor_name, actress_name):
        super().__init__(event_name, event_date, event_time, venue_name, total_seats, ticket_price, event_type="Movie")
        self.genre = 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}")
```



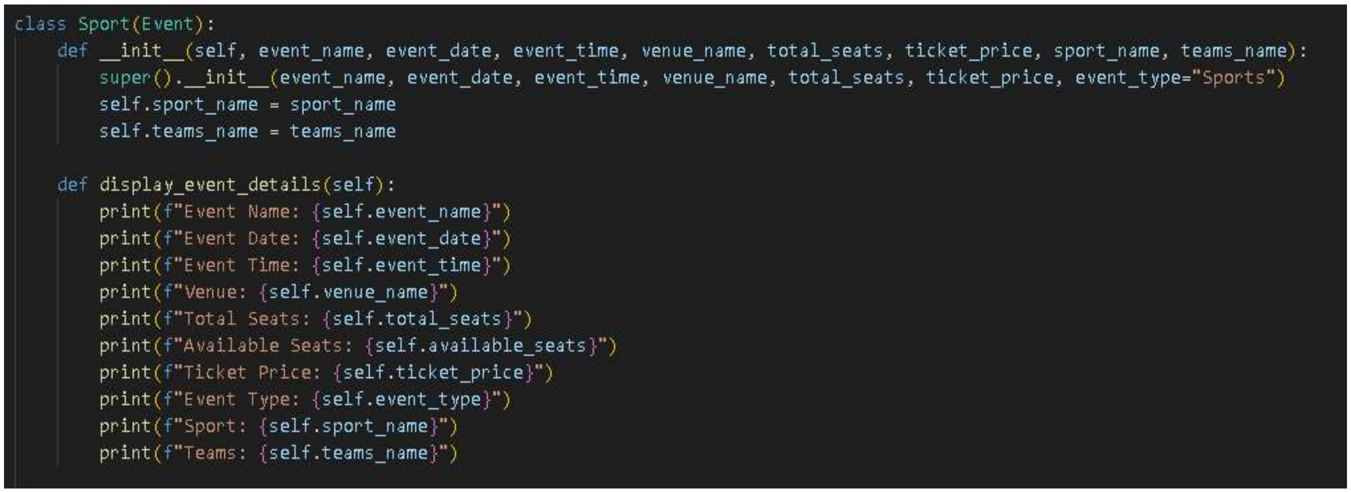
```python
def calculate_total_revenue(self, num_tickets):
    return num_tickets * self.ticket_price

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
```



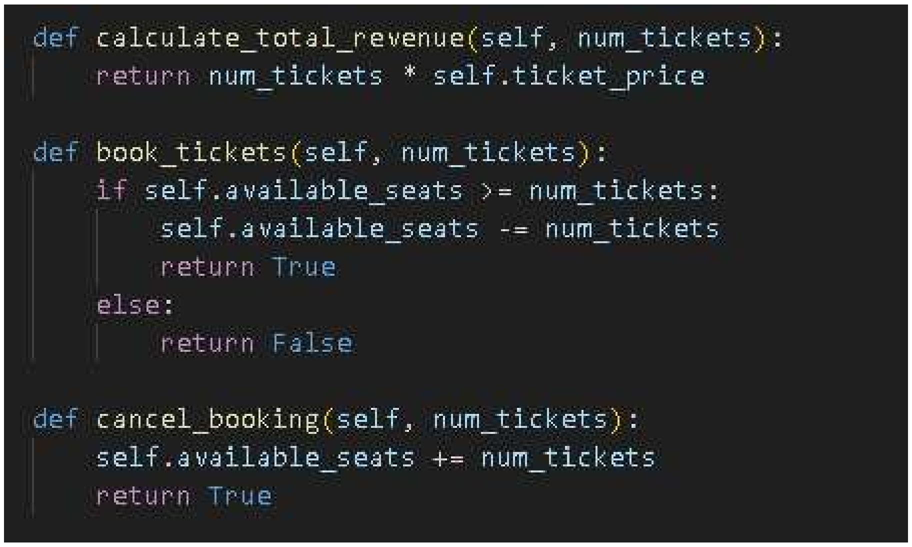
```python
class Concert(Event):
    def __init__(self, event_name, event_date, event_time, venue_name, total_seats, ticket_price, artist, concert_type):
        super().__init__(event_name, event_date, event_time, venue_name, total_seats, ticket_price, event_type="Concert")
        self.artist = artist
        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}")
```



```python
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
```



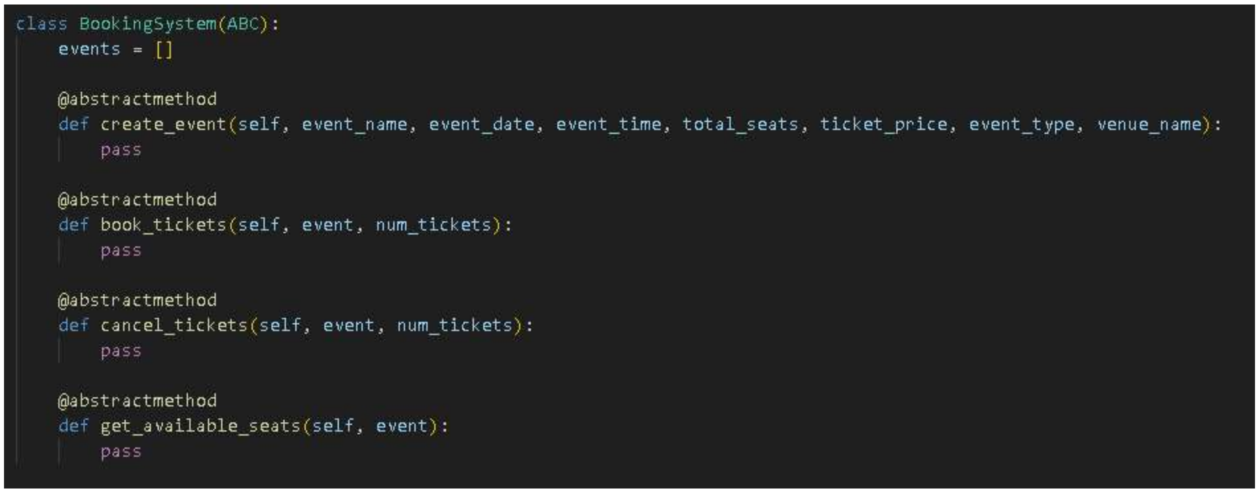
```python
class Sport(Event):
    def __init__(self, event_name, event_date, event_time, venue_name, total_seats, ticket_price, sport_name, teams_name):
        super().__init__(event_name, event_date, event_time, venue_name, total_seats, ticket_price, event_type="Sports")
        self.sport_name = sport_name
        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
```

3. BookingSystem Abstraction:

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



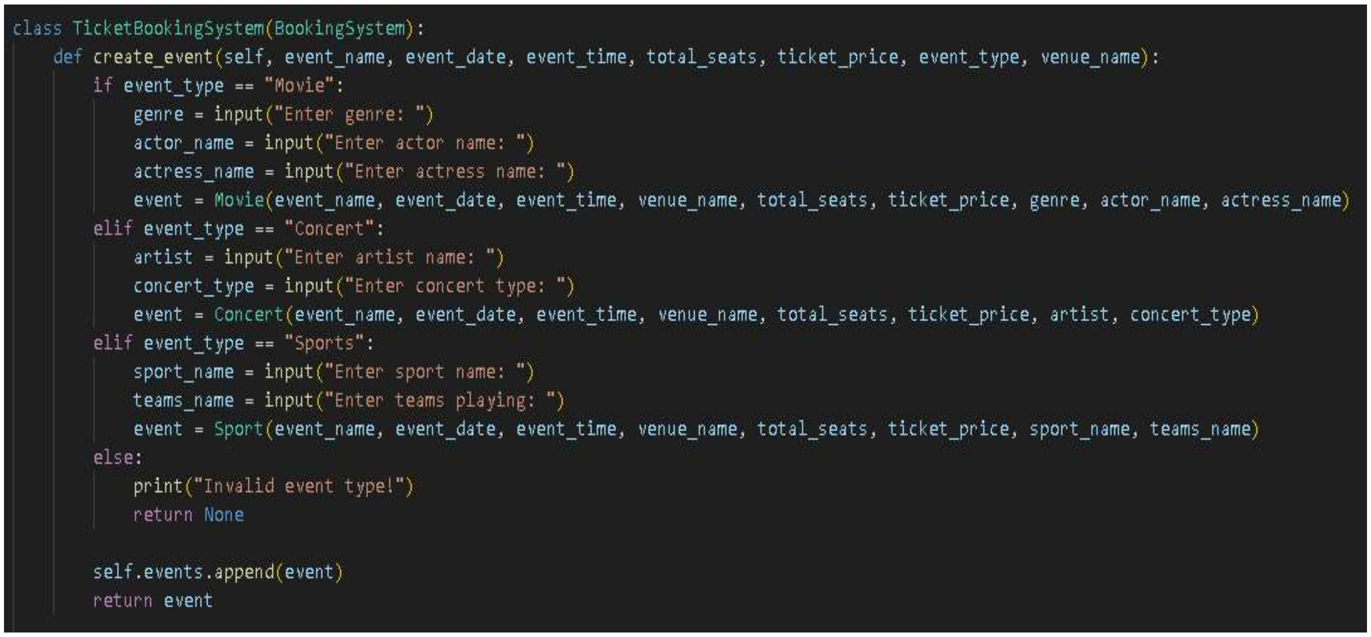
```
class BookingSystem(ABC):
    events = []

    @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
```

4. Concrete TicketBookingSystem Class:

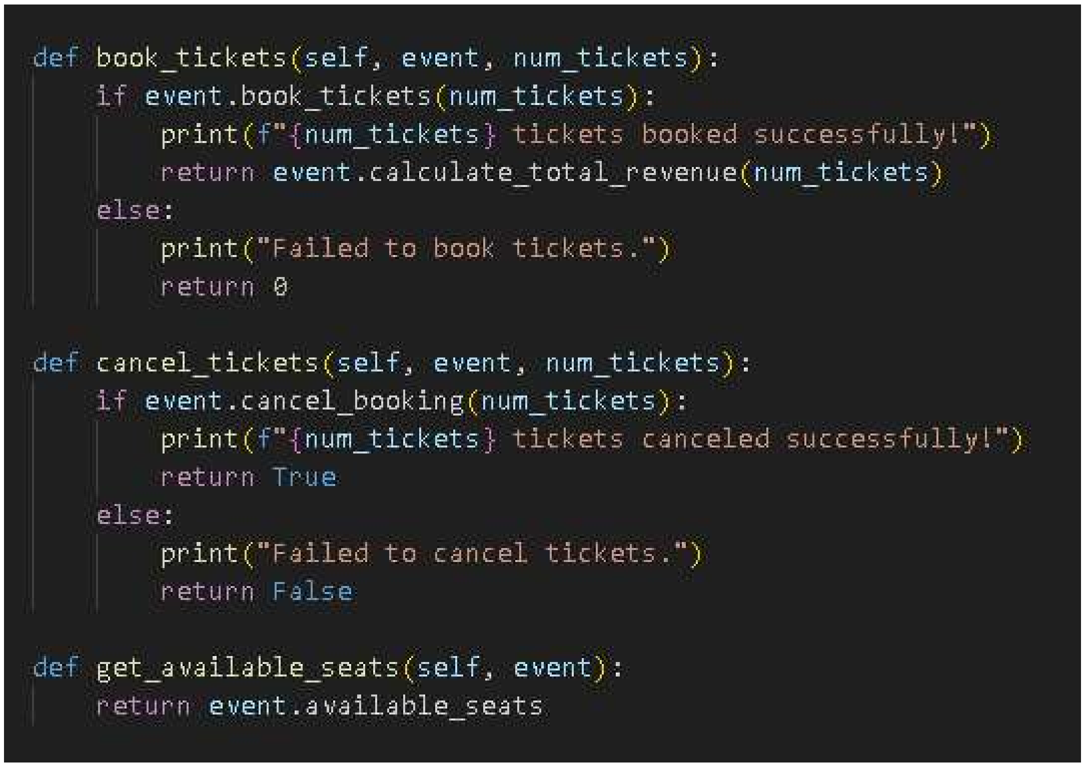
• Create a concrete class TicketBookingSystem that inherits from BookingSystem:

• 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



```python
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
```



```python
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
```

Task 7: Has A Relation / Association

Create a Following classes with the following attributes and methods:

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.

--> Done in Task 4

2. Event Class:

• Attributes:

o event_name,

o event_date DATE,

o event_time TIME,

o venue (reference of class Venu),

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 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.

--> Done in Task 4

3. Event sub classes:

• Create three sub classes that inherit from Event abstract class and override abstract methods in concrete class should declare the variables as mentioned in above Task 2:

o Moviets.

o Concert.

o Sport.

--> Done in Task 5

4. 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.

--> Done in Task 4

5. Create a class Booking with the following attributes:

• bookingId (should be incremented for each booking)

• array of customer (reference to the customer who made the booking)

• event (reference to the event booked)

• num_tickets(no of tickets and array of customer must equal)

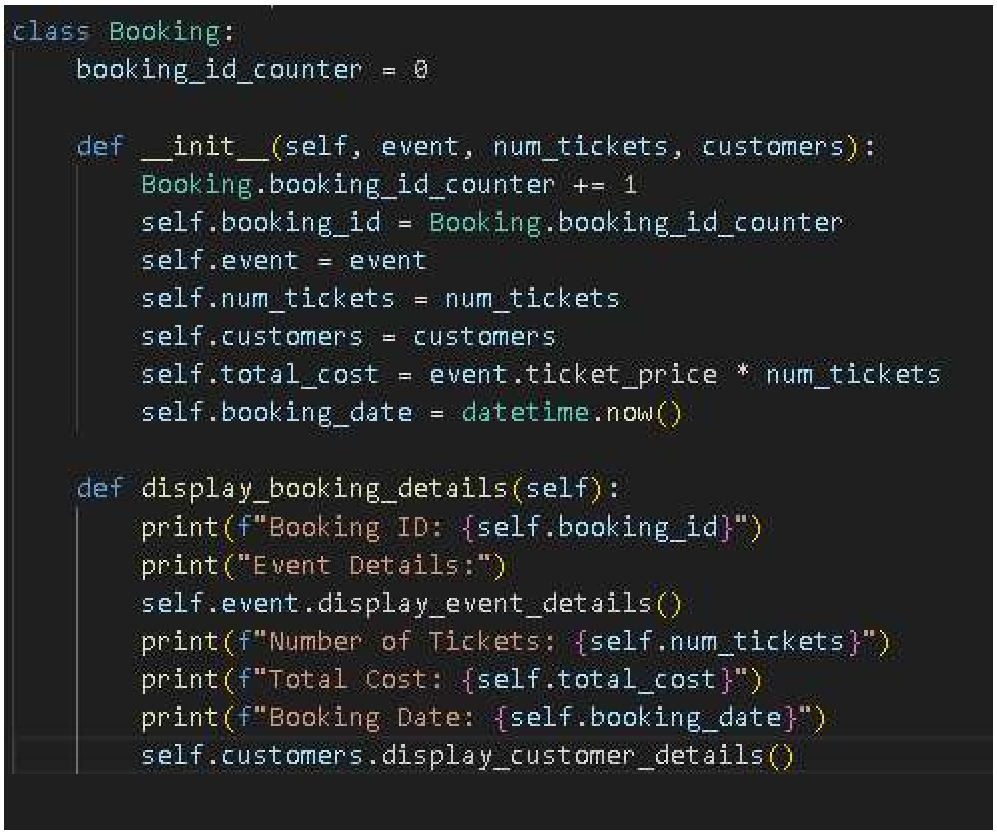
• total_cost

• booking_date (timestamp of when the booking was made)

• Methods and Constuctors:

o Implement default constructors and overload the constructor with Customer attributes, generate getter and setter methods.

o display_booking_details(): Display customer details.



```python
class Booking:
    booking_id_counter = 0

    def __init__(self, event, num_tickets, customers):
        Booking.booking_id_counter += 1
        self.booking_id = Booking.booking_id_counter
        self.event = event
        self.num_tickets = num_tickets
        self.customers = customers
        self.total_cost = event.ticket_price * num_tickets
        self.booking_date = datetime.now()

    def display_booking_details(self):
        print(f"Booking ID: {self.booking_id}")
        print("Event Details:")
        self.event.display_event_details()
        print(f"Number of Tickets: {self.num_tickets}")
        print(f"Total Cost: {self.total_cost}")
        print(f"Booking Date: {self.booking_date}")
        self.customers.display_customer_details()
```

6. BookingSystem Class to represent the Ticket booking system.

Perform the following operation in main method.

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

• **Attributes**

o array of events

• **Methods and Constuctors:**

o create_event(event_name: str, date:str, time:str, total_seats: int, ticket_price: float, event_type: str, venu:Venu):

Create a new event with the specified details and event type (movie, sport or concert) and return event object.

o calculate_booking_cost(num_tickets): Calculate and set the total cost of the booking.

o book_tickets(eventname:str, num_tickets, arrayOfCustomer): Book a specified number of tickets for an event. for each tickets customer object should be created and stored in array also should update the attributes of Booking class.

o cancel_booking(booking_id): Cancel the booking and update the available seats.

o getAvailableNoOfTickets(): return the total available tickets

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

o 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,", "get_event_details," and "exit.

-->Done in Task 5

Task 8: Interface/abstract class, and Single Inheritance, static variable

1. Create Venue, class as mentioned above Task 4.

--> Done in Task 4

2. Event Class:

• Attributes:

o event_name,

o event_date DATE,

o event_time TIME,

o venue (reference of class Venu),

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.

--> Done in Task 4

3. Create Event sub classes as mentioned in above Task 4.

--> Done in Task 4

4. Create a class Customer and Booking as mentioned in above Task 4.

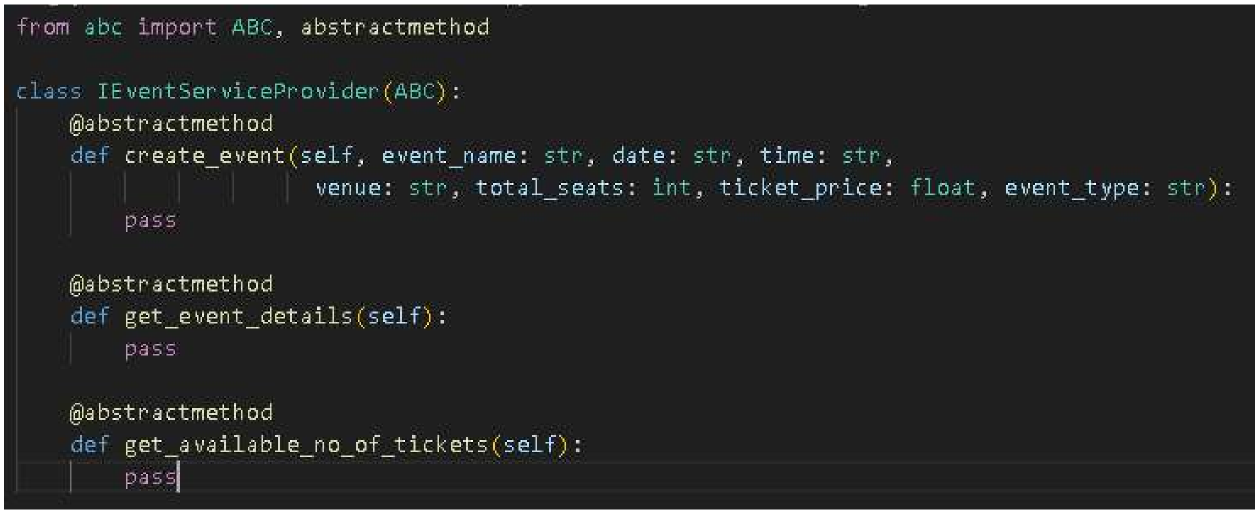
--> Done in Task 4

5. Create interface/abstract class IEventServiceProvider with following methods:

• create_event(event_name: str, date:str, time:str, total_seats: int, ticket_price: float, event_type: str, venu: Venu): Create a new event with the specified details and event type (movie, sport or concert) and return event object.

• getEventDetails(): return array of event details from the event class.

• getAvailableNoOfTickets(): return the total available tickets.



```
from abc import ABC, abstractmethod

class IEventServiceProvider(ABC):
    @abstractmethod
    def create_event(self, event_name: str, date: str, time: str,
                     venue: str, total_seats: int, ticket_price: float, event_type: str):
        pass

    @abstractmethod
    def get_event_details(self):
        pass

    @abstractmethod
    def get_available_no_of_tickets(self):
        pass
```

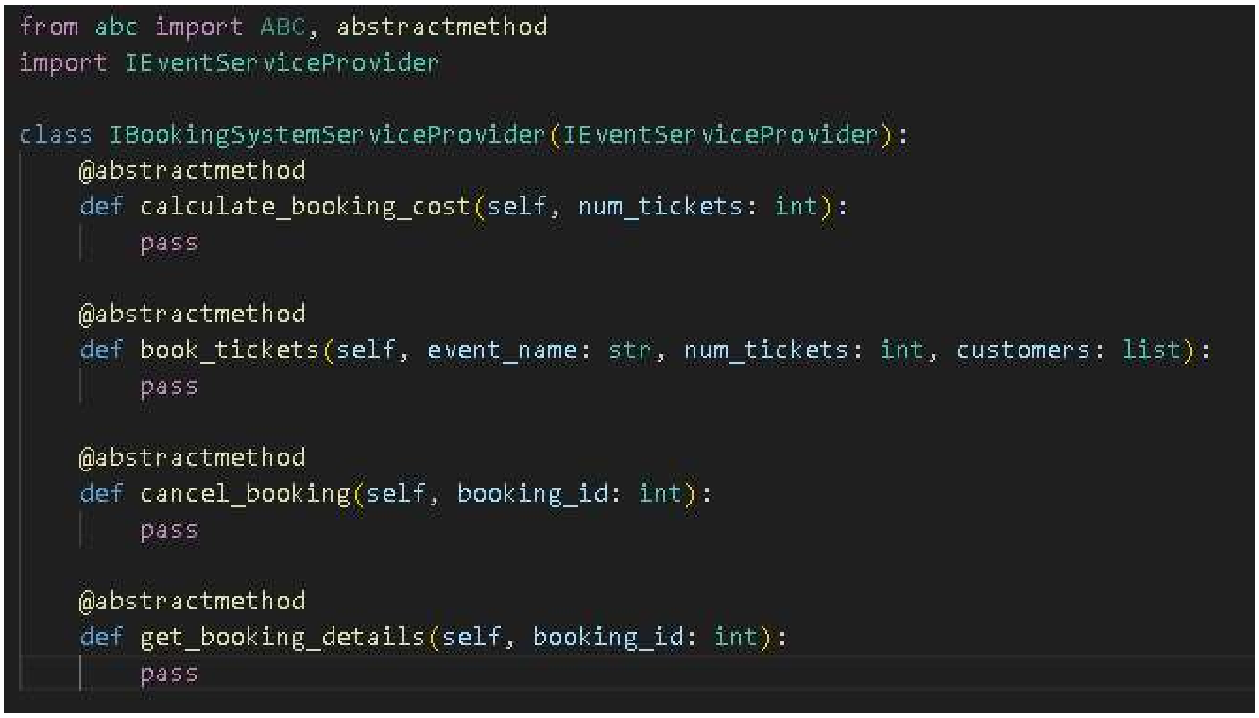
6. Create interface/abstract class IBookingSystemServiceProvider with following methods:

• calculate_booking_cost(num_tickets): Calculate and set the total cost of the booking.

• book_tickets(eventname:str, num_tickets, arrayOfCustomer): Book a specified number of tickets for an event. for each tickets customer object should be created and stored in array also should update the attributes of Booking class.

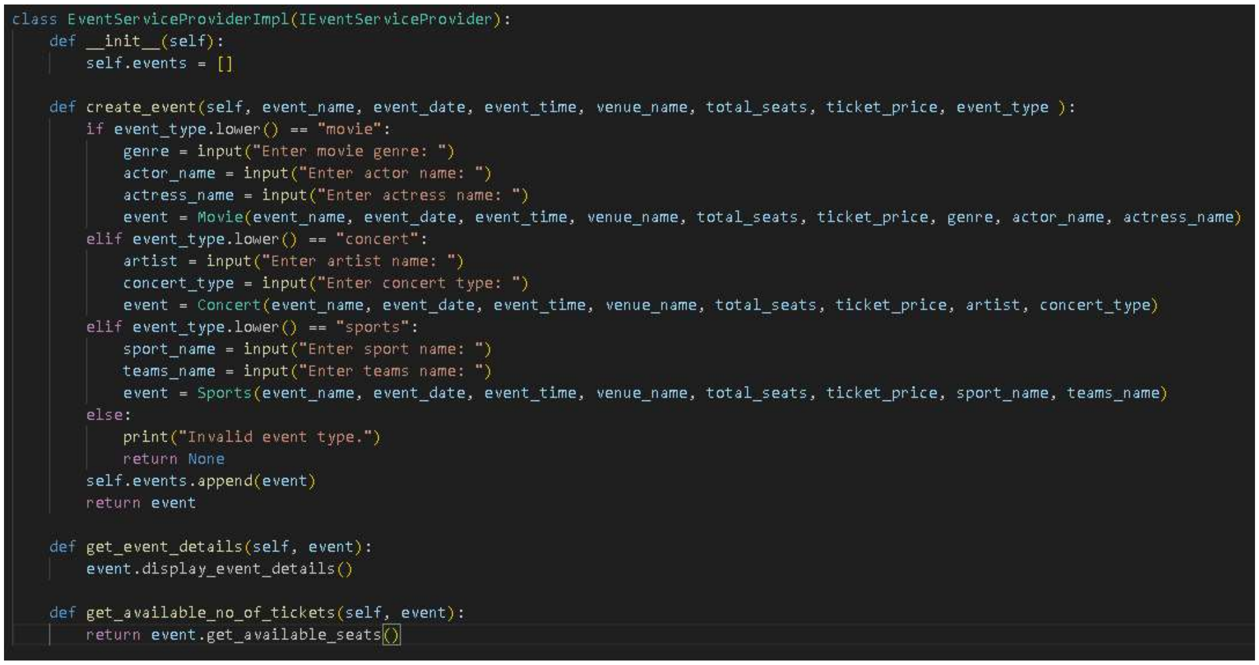
• cancel_booking(booking_id): Cancel the booking and update the available seats.

• get_booking_details(booking_id):get the booking details.



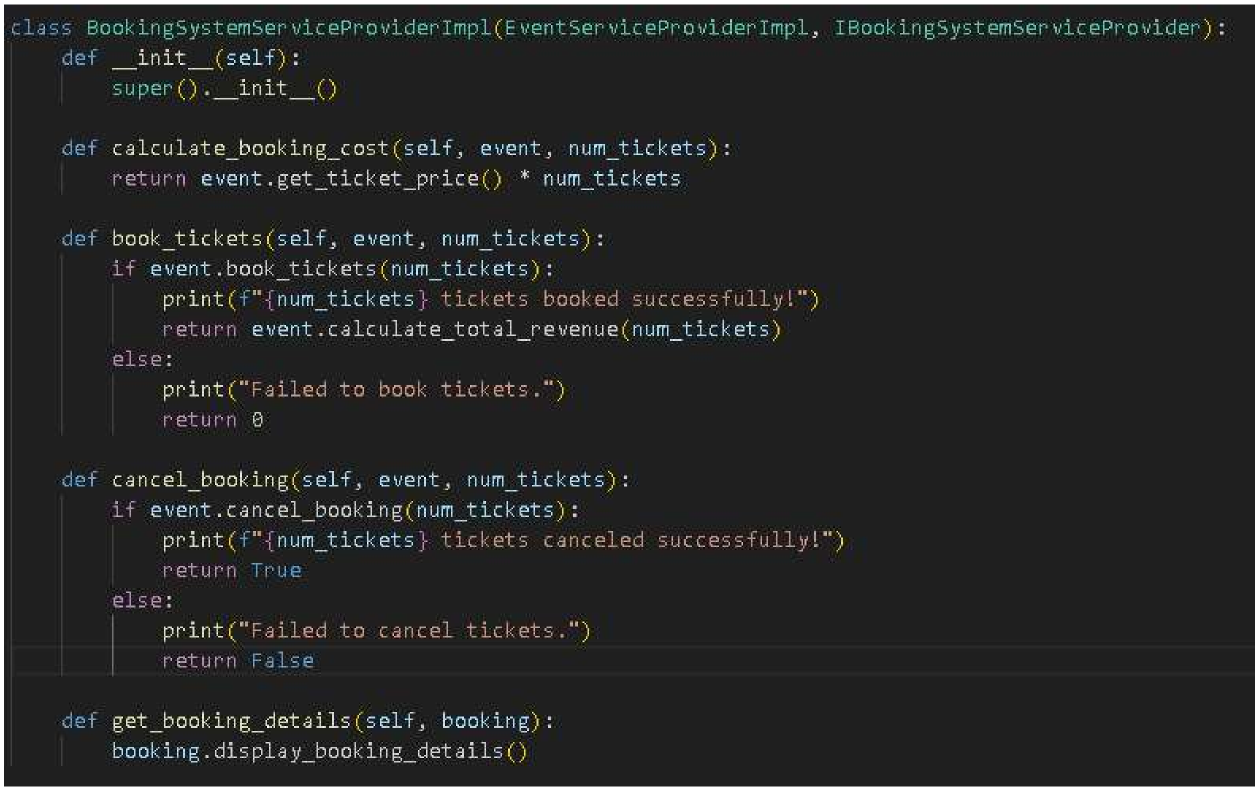
```python
from abc import ABC, abstractmethod
import IEventServiceProvider

class IBookingSystemServiceProvider(IEventServiceProvider):
    @abstractmethod
    def calculate_booking_cost(self, num_tickets: int):
        pass

    @abstractmethod
    def book_tickets(self, event_name: str, num_tickets: int, customers: list):
        pass

    @abstractmethod
    def cancel_booking(self, booking_id: int):
        pass

    @abstractmethod
    def get_booking_details(self, booking_id: int):
        pass
```

7. Create EventServiceProviderImpl class which implements IEventServiceProvider provide all implementation methods.


```python
class EventServiceProviderImpl(IEventServiceProvider):
    def __init__(self):
        self.events = []

    def create_event(self, 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
        self.events.append(event)
        return event

    def get_event_details(self, event):
        event.display_event_details()

    def get_available_no_of_tickets(self, event):
        return event.get_available_seats()
```

. Create BookingSystemServiceProviderImpl class which implements IBookingSystemServiceProvider provide all implementation methods and inherits EventServiceProviderImpl class with following attributes.

• Attributes o array of events


```python
class BookingSystemServiceProviderImpl(EventServiceProviderImpl, IBookingSystemServiceProvider):
    def __init__(self):
        super().__init__()

    def calculate_booking_cost(self, event, num_tickets):
        return event.get_ticket_price() * num_tickets

    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_booking(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_booking_details(self, booking):
        booking.display_booking_details()
```

9. Create TicketBookingSystem class and perform following operations:

• 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,", "get_event_details," and "exit."

10. Place the interface/abstract class in service package and interface/abstract class implementation class, all concrete class in bean package and TicketBookingSystem class in app package.

11. Should display appropriate message when the event or booking id is not found or any other wrong information provided.

--> Done in Task 5

Task 9: Exception Handling

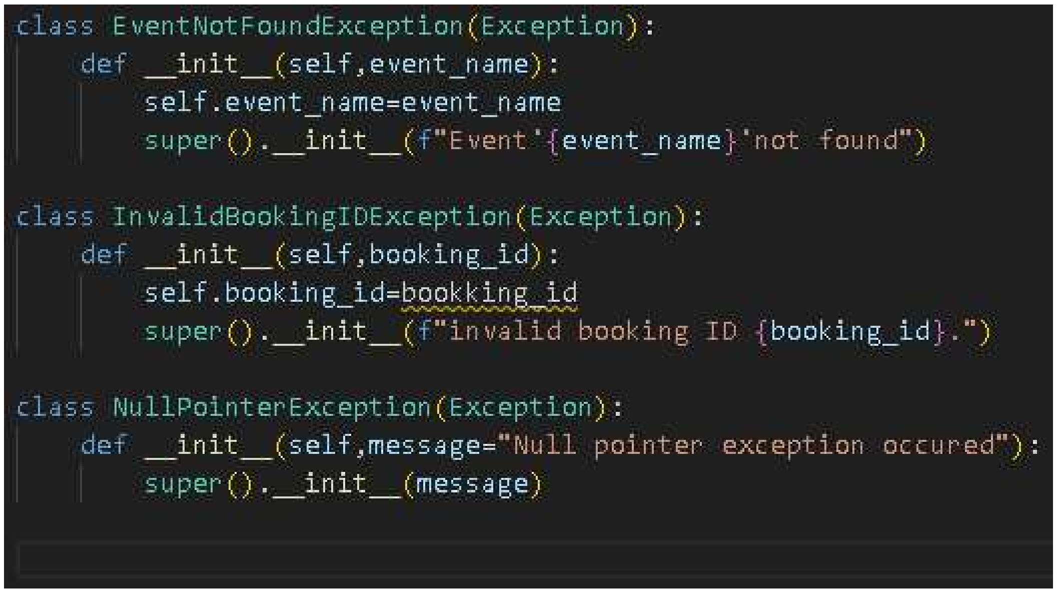
Exception Handling throw the exception whenever needed and Handle in main method,

1. EventNotFoundException throw this exception when user try to book the tickets for Event not listed in the menu.

2. InvalidBookingIDException throw this exception when user entered the invalid bookingId when he tries to view the booking or cancel the booking.

3. NullPointerException handle in main method. Throw these exceptions from the methods in TicketBookingSystem class.

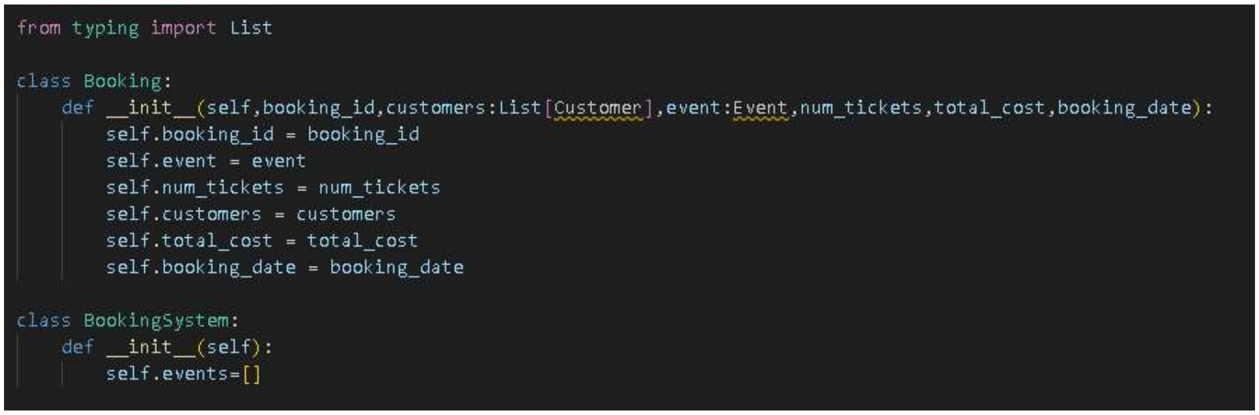
Make necessary changes to accommodate exception in the source code. Handle all these exceptions from the main program.



```
class EventNotFoundException(Exception):
    def __init__(self,event_name):
        self.event_name=event_name
        super().__init__(f"Event'{event_name}'not found")

class InvalidBookingIDException(Exception):
    def __init__(self,booking_id):
        self.booking_id=bookking_id
        super().__init__(f"invalid booking ID {booking_id}.")

class NullPointerException(Exception):
    def __init__(self,message="Null pointer exception occured"):
        super().__init__(message)
```

Task 10: Collection

1. From the previous task change the Booking class attribute customers to List of customers and BookingSystem class attribute events to List of events and perform the same operation.

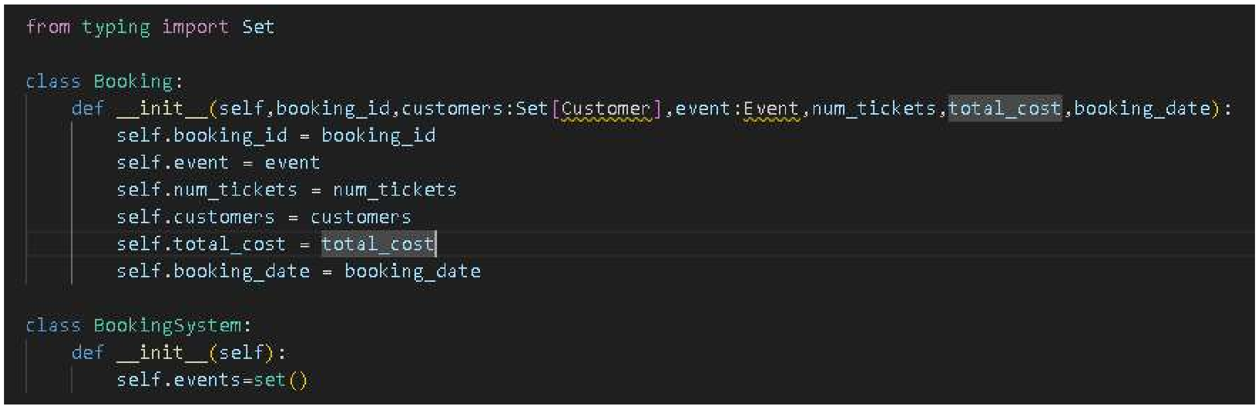


```
from typing import List

class Booking:
    def __init__(self,booking_id,customers:List[Customer],event:Event,num_tickets,total_cost,booking_date):
        self.booking_id = booking_id
        self.event = event
        self.num_tickets = num_tickets
        self.customers = customers
        self.total_cost = total_cost
        self.booking_date = booking_date

class BookingSystem:
    def __init__(self):
        self.events=[]
```

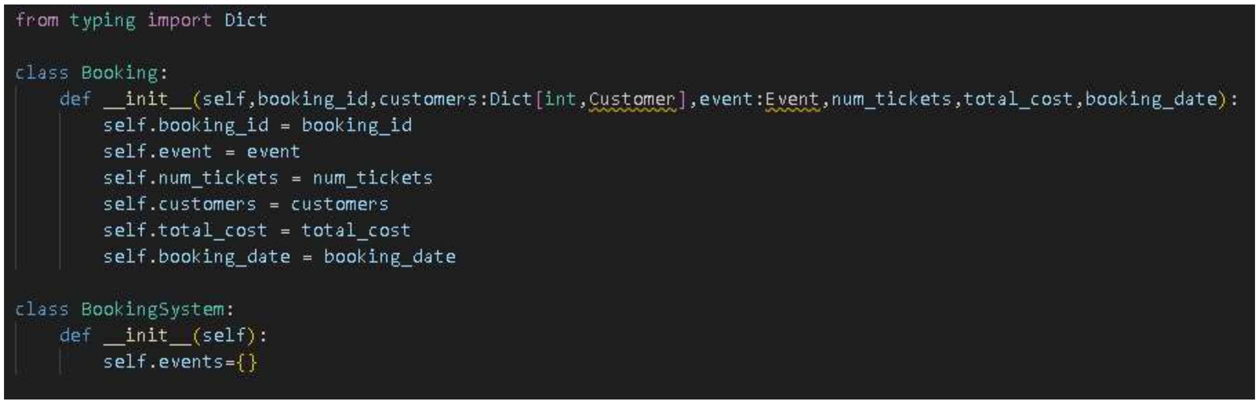
2. From the previous task change all list type of attribute to type Set in Booking and BookingSystem class and perform the same operation.

• Avoid adding duplicate Account object to the set.

• Create Comparator object to sort the event based on event name and location in alphabetical order.


```
from typing import Set

class Booking:
    def __init__(self,booking_id,customers:Set[Customer],event:Event,num_tickets,total_cost,booking_date):
        self.booking_id = booking_id
        self.event = event
        self.num_tickets = num_tickets
        self.customers = customers
        self.total_cost = total_cost
        self.booking_date = booking_date

class BookingSystem:
    def __init__(self):
        self.events=set()
```

3. From the previous task change all list type of attribute to type Map object in Booking and BookingSystem class and perform the same operation.


```
from typing import Dict

class Booking:
    def __init__(self,booking_id,customers:Dict[int,Customer],event:Event,num_tickets,total_cost,booking_date):
        self.booking_id = booking_id
        self.event = event
        self.num_tickets = num_tickets
        self.customers = customers
        self.total_cost = total_cost
        self.booking_date = booking_date

class BookingSystem:
    def __init__(self):
        self.events={}
```

Task 11: Database Connectivity

1. Create Venue, Event, Customer and Booking class as mentioned above Task 5.

2. Create Event sub classes as mentioned in above Task 4.

3. Create interface/abstract class IEventServiceProvider, IBookingSystemServiceProvider and its implementation classes as mentioned in above Task 5.

4. Create IBookingSystemRepository interface/abstract class which include following methods to interact with database.

• create_event(event_name: str, date:str, time:str, total_seats: int, ticket_price: float, event_type: str, venu: Venu): Create a new event with the specified details and event type (movie, sport or concert) and return event object and should store in database.

• getEventDetails(): return array of event details from the database.

• getAvailableNoOfTickets(): return the total available tickets from the database.

• calculate_booking_cost(num_tickets): Calculate and set the total cost of the booking.

• book_tickets(eventname:str, num_tickets, listOfCustomer): Book a specified number of tickets for an event. for each tickets customer object should be created and stored in array also should update the attributes of Booking class and stored in database.

• cancel_booking(booking_id): Cancel the booking and update the available seats and stored in database.

• get_booking_details(booking_id): get the booking details from database.

5. Create BookingSystemRepositoryImpl interface/abstract class which implements IBookingSystemRepository interface/abstract class and provide implementation of all methods and perform the database operations.

6. Create DBUtil class and add the following method.

• static getDBConn():Connection Establish a connection to the database and return Connection reference

7. Place the interface/abstract class in service package and interface implementation class, concrete class in bean package and TicketBookingSystemRepository class in app package.

8. Should throw appropriate exception as mentioned in above task along with handle SQLException.

9. Create TicketBookingSystem class and perform following operations:

• 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,", "get_event_details," and "exit."