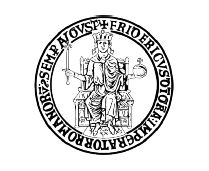
Università degli Studi di Napoli Federico II



Corso di Laurea in Informatica

Insegnamento di algoritmi e strutture dati

**Progetto II**

**Compagnia Aerea e Prenotazione Voli**

**id gruppo: G33**

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**1.INTRODUZIONE**

Si vuole rappresentare un sistema di gestione e prenotazione voli per una compagnia aerea. Il sistema permette all’utente di poter visualizzare tutti i possibili voli e di poter prenotare un volo in particolare (solo per utenti registrati al sistema). Il sistema permette all’utente di scegliere di non inserire la città di arrivo per avere dei suggerimenti. Il sistema visualizzerà la meta più economica e la “meta più gettonata”. Nel nostro caso la meta più gettonata corrisponde alla città per la quale sono stati acquistati più biglietti. Ogni utente per ogni acquisto di un biglietto riceverà dei punti in base alla spesa effettuata che potranno essere usati come sconto sui futuri viaggi con la compagnia. Inoltre, è presente un’area amministrazione dove è possibile gestire tutta la parte dedicata ai voli e agli utenti. In particolare, il sistema permette all’amministratore di poter aggiungere sia nuove città sia nuove rotte per gli aerei e di visualizzare la lista di tutti gli utenti e prenotazioni presenti nel sistema.

**2.SUDDIVISIONE DEL LAVORO**

Dato il periodo che stiamo vivendo è stato impossibile per noi componenti del team potersi vedere di persona per organizzare il lavoro quindi ci siamo avvalsi di strumenti informatici come Teams o Skype. Inizialmente le nostre riunioni telematiche si sono focalizzate su come affrontare al meglio il problema in esame. Confrontando le nostre idee e selezionando la migliore soluzione proposta sempre in accordo con tutto il team. Una volta decise le strutture da utilizzare e lo scheletro delle funzioni da implementare non c’è stata una vera e propria suddivisione del lavoro in quanto abbiamo continuato a lavorare in coesione tra di noi tenendoci sempre in contatto telematico. Questo ci è stato di grande aiuto poiché avevamo la possibilità di confrontarci in tempo reale per qualsiasi evenienza.

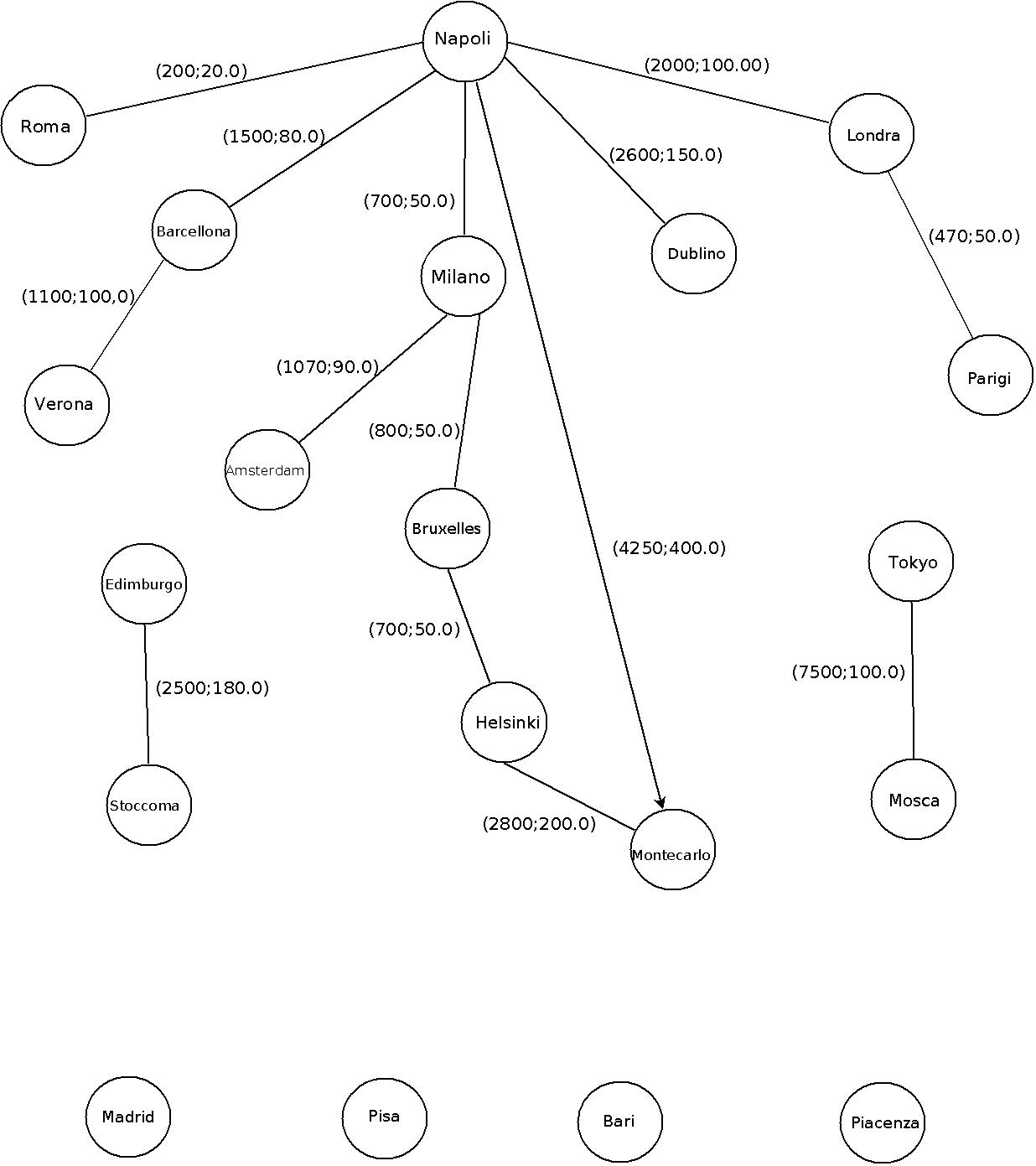
**3.SCELTE IMPLEMENTATIVE**

Per poter rappresentare tutte le città con i vari collegamenti fra di loro abbiamo scelto di utilizzare il grafo come struttura principale. Esso ci permette di effettuare delle ricerche mirate e veloci tra due diverse città in modo da trovare il percorso più efficiente in quel momento. Questo ci è stato possibile implementando all’interno del nostro codice l’algoritmo di Dijkstra. Per l’implementazione del grafo ci siamo serviti delle strutture “vertice” e “arco” per la rappresentazione rispettivamente delle città (nodi) e dei collegamenti tra le diverse città (archi) presenti del grafo. Per rendere permanenti le modifiche alla struttura del grafo vengono utilizzati due file per la memorizzazione di tutte le città e delle varie tratte.

Per le prenotazioni si è scelto di memorizzarle tutte in un unico file. Dopo ogni accesso da parte dell’utente vengono caricate in modo dinamico, se presenti, tutte le prenotazioni corrispondenti all’utente loggato in quel momento e inserite all’interno di una lista appositamente creata presente nella struttura “utente”.

I dati degli utenti registrati al sistema sono presenti anch’essi in un file a loro dedicato. Insieme alle credenziali viene anche salvato il saldo attuale dei punti accumulati. I dati degli utenti sono caricati all’interno di una struttura ad albero. Questo ci permette di aumentare l’efficienza della ricerca al momento dell’login.

**4.DETTAGLIO GRAFO INIZIALE**



Questa è la rappresentazione del grafo all’inizio dell’esecuzione. Ogni arco possiede due pesi diversi. Essi sono rappresentati con la seguente notazione (distanza;costo) dove banalmente “distanza” si riferisce alla distanza in chilometri tra le due città e “costo” si riferisce al costo in euro della rispettiva tratta. Questi due diversi valori ci permettono in base all’esigenza di calcolare velocemente il percorso più breve o più economico tra due diverse città.

Si noti che sono state inserite appositamente delle città senza tratte per fini di testing.

**5.GUIDA ALL’USO**

Per effettuare le scelte tra i vari menu l’utente deve inserire tramite tastiera il numero corrispondente all’azione da compiere e successivamente premere il tasto INVIO.

Menu principale:



La schermata iniziale permette all’utente molteplici soluzioni. L’utente può o registrarsi oppure effettuare il login con le proprie credenziali. Inoltre, è presente la voce amministratore per accedere alle funzionalità riguardanti i voli e gli utenti.

Registrazione nuovo utente:



In questa schermata viene mostrato come l’utente inserisce username e password per registrarsi al sistema. Si noti che nel caso in cui l’username inserito sia già esistente il sistema propone all’utente di cambiarlo.

Menu principale Utente:



Questa è l’interfaccia del sistema in cui viene visualizzato il menu principale per un utente registrato. Qui l’utente può scegliere se effettuare una nuova prenotazione o visualizzare, se presenti, le proprie prenotazioni effettuate. In alto sono presenti il nome utente e il suo saldo punti.

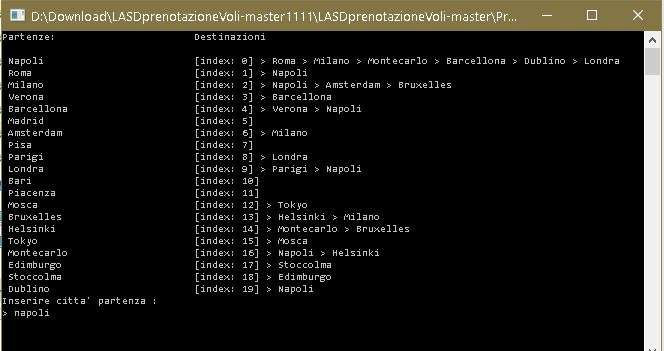
Prenotazioni attive:

Immagine che contiene screenshot, disegnando

Descrizione generata automaticamente

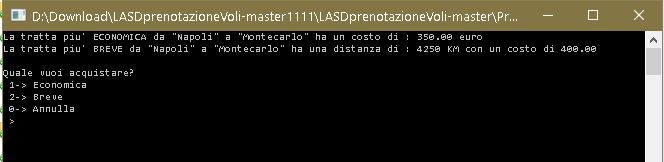
In questa schermata si mostra ciò che si vedrebbe a video nel caso in cui un utente decida di visualizzare la lista delle sue prenotazioni attive.

Effettua prenotazione:



Se l’utente decide di effettuare una nuova prenotazione vengono visualizzati tutti i voli in programma. Sulla sinistra possiamo notare tutte le possibili città di partenza mentre sulla destra una lista di destinazioni possibili per quella data citta di partenza. Le città senza una lista sono le città inserite all’interno del grafo per la quale non sono stati definiti dei voli. Successivamente l’utente può inserire la citta di partenza e quella di destinazione.

Si noti che durante la prenotazione l’utente può scegliere di non specificare la destinazione. In questo caso l’utente ha scelto di specificare la destinazione.



Il sistema calcola la tratta e il costo. Se ci sono più tratte per la meta inserita il sistema propone all’utente di scegliere la tratta più breve oppure quella più economica.

Immagine che contiene screenshot

Descrizione generata automaticamente

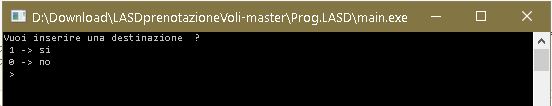
Il sistema controlla il saldo punti dell’utente proponendo uno sconto sul biglietto nel caso ne sia in possesso.

Successivamente viene visualizzato un resoconto della prenotazione.

Effettua prenotazione senza specificare la destinazione:

![Immagine che contiene cibo

Descrizione generata automaticamente](data:image/jpeg;base64,/9j/4AAQSkZJRgABAQEAYABgAAD/4RD+RXhpZgAATU0AKgAAAAgABAE7AAIAAAARAAAISodpAAQAAAABAAAIXJydAAEAAAAiAAAQ1OocAAcAAAgMAAAAPgAAAAAc6gAAAAgAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAEFudG9uaW8gVmFuYWNvcmUAAAAFkAMAAgAAABQAABCqkAQAAgAAABQAABC+kpEAAgAAAAM0OAAAkpIAAgAAAAM0OAAA6hwABwAACAwAAAieAAAAABzqAAAACAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA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KKACiiigAooooAKKKKACiiigAooooAKKKKACiiigAooooAKKKKACiiigAooooAKKKKAPr34MWk9x8F/DbRJuUR3AzkD/AJepq7f+zbv/AJ5f+PD/ABrm/gN/yQ7w7/u3P/pVLXoVAHk/j6N4dZtEkGGFoMjP/TR6Kn+Jn/Iy2/8A16L/AOhvRXk1v4jOmPwn/9k=)



L’utente decide di effettuare una nuova prenotazione. Inserisce la citta di partenza e indica al sistema di non voler inserire la città di destinazione.

Immagine che contiene screenshot

Descrizione generata automaticamente

Il sistema calcola tutte le tratte possibili da quella città e propone all’utente la città che ha il costo del biglietto più economico e la città per la quale, data quella città di partenza inserita, sono stati acquistati più biglietti. Successivamente l’utente inserisce la meta desiderata e il sistema calcola il costo controllando sempre anche il saldo punti dell’utente in questione e nel caso proporre uno sconto sul biglietto.

Menu amministratore:

**Immagine che contiene screenshot

Descrizione generata automaticamente**

In questa schermata sono presenti tutte le operazioni possibili per l’amministratore del sistema. Da qui si può gestire tutta la rete dei voli e visualizzare le informazioni su utenti e prenotazioni.