

# RAILWAY INFORMATION SYSTEM

## CENG 492 Computer Engineering Design

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User Manual

**BUGBUSTERS**

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# Contents

- 1. INTRODUCTION ..... 3**
  - 1.1. Overview..... 3
  - 1.2. Scope & Organization of the Manual ..... 3
  - 1.3. Contact & Support ..... 3
- 2. SYSTEM SUMMARY..... 3**
  - 2.1. User Accounts..... 3
    - 2.1.1. User Registration ..... 3
    - 2.1.2. User Login/Logout ..... 4
    - 2.1.3. User Profile Update ..... 4
  - 2.2. Optimized Path Search ..... 4
    - 2.2.1. Saving Search Results ..... 5
    - 2.2.2. Converting Saved Results into Tickets..... 5
    - 2.2.3. Cancelling..... 5
  - 2.3. Knowledge Database ..... 5
    - 2.3.1. Entering a New Question..... 6
    - 2.3.2. Answering a Question..... 6
  - 2.4. Machinist Train Assignments..... 7
  - 2.5. View Assigned Jobs..... 8
  - 2.6. Train Tracking ..... 8

# 1. INTRODUCTION

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## 1.1. Overview

Railway Information System (RIS) is a software package that is designed for managing/organizing a railway system and enhancing the services such a system offers to its users. Administrators may assign the machinists to trains automatically, passengers may search for optimized paths or anyone can see the trains on an interactive map.

## 1.2. Scope & Organization of the Manual

This user manual is prepared to clarify how to use the Railway Information System from different user type perspectives and describe its features.

In section 2, the services provided will be explained briefly with some sample scenarios.

## 1.3. Contact & Support

For further assistance you may contact us through e-mail:

- [bugbustersteam@gmail.com](mailto:bugbustersteam@gmail.com)

Also you may found some resources on our project web page:

- <http://senior.ceng.metu.edu.tr/2010/bugbusters/>

# 2. SYSTEM SUMMARY

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Railway Information System provides many services and facilities to its users. Below they are described in more detail with screenshots.

## 2.1. User Accounts

Users of the Railway Information System need an account to use all the facilities of the system. A new user without an account may simply register for a new account, update his/her account and use this account to log into the system.

### 2.1.1. User Registration

Users may register to the system by filling the form which appears when “Yeni Kullanıcı” link is clicked. When the



\*Kullanıcı adınız:

\*Şifreniz:

\*Adınız:

\*Soyadınız:

\*E-Posta Adresiniz:

\*Telefonunuz:

Doğum Tarihiniz:

Yaşadığınız şehir:

En çok sehayat ettiğiniz şehir:

Tamam

Figure 1 : Registration Form

form is sent, immediately a confirmation e-mail is sent to the user's e-mail. As soon as the link in that e-mail is clicked, the user account is activated by the system.

### 2.1.2. User Login/Logout

After registration, users may login/logout to the system to use the provided services. Login process requires a matching user name and password tuple. Logged in users may use the logout button to safely exit from the system.

### 2.1.3. User Profile Update

Users may update their profiles by clicking the "Kişisel Bilgiler" button on the left menu. Clicking this button shows a form filled with user's current information.

## Kullanıcı Bilgileri

*Kullanıcı adınız:	<input type="text" value="brk"/>
*Adınız:	<input type="text" value="burkay"/>
*Soyadınız:	<input type="text" value="sucu"/>
*E-Posta Adresiniz:	<input type="text" value="burkay@gmail.com"/>
*Telefonunuz:	<input type="text" value="-"/>
Doğum Tarihiniz:	<input type="text" value="16.03.1987"/>
Yaşadığınız şehir	<input type="text" value="-"/>
En çok sehayat ettiğiniz şehir	<input type="text" value="istanbul"/>

Kullanıcı Bilgilerinizi Güncellemek İçin [Tıklayınız ->](#)

Figure 2 : User Profile Update

At this state, the form is locked. To update the information on the form, user should click the link below the form first. Then the form becomes updateable and user may enter the changes. Restrictions includes that the user name field is non-updateable and the fields marked with an asterisk cannot be empty.

## 2.2. Optimized Path Search

One of the awesome services of Railway Information System, *optimized path searching* is essentially implemented for passengers. According to user input, RIS path finding algorithm generates possible paths and presents them to the user for further usage.

**Yolculuk Planlama Sistemi**

Kalkış yeri:

Varış Yeri:

Tarih:

Zaman Aralığı:  'den  'e

Maximum Ücret:  TL

Maksimum Aktarma :

Maksimum Bekleme Süresi:  Saat

Seçenek	Tarih	Tren No	Kalkış Yeri	Kalkış Saati	Varış Yeri	Varış Saati	Yolculuk Süresi	Ücret	Aktarma	
0	16.03.2010	TR004	Ankara	10:00:00	Nevşehir	11:00:00	01:00	8.0	-	
0	16.03.2010	TR0010	Nevşehir	11:00:00	Kayseri	12:00:00	01:00	12.0	-	
0	16.03.2010	TR0010	Kayseri	12:00:00	Sivas	13:00:00	01:00	20.0	-	
<b>Özet:</b>		16.03.2010	-	Ankara	10:00:00	Sivas	13:00:00	03:00	40.0	1

Seçenek	Tarih	Tren No	Kalkış Yeri	Kalkış Saati	Varış Yeri	Varış Saati	Yolculuk Süresi	Ücret	Aktarma	
1	16.03.2010	TR004	Ankara	10:00:00	Nevşehir	11:00:00	01:00	8.0	-	
1	16.03.2010	TR0010	Nevşehir	11:00:00	Kayseri	12:00:00	01:00	12.0	-	
1	16.03.2010	TR008	Kayseri	15:00:00	Yozgat	16:00:00	01:00	24.0	-	
1	16.03.2010	TR009	Yozgat	17:00:00	Sivas	18:00:00	01:00	28.0	-	
<b>Özet:</b>		16.03.2010	-	Ankara	10:00:00	Sivas	18:00:00	08:00	72.0	3

Figure 3 : Path Search

### 2.2.1. Saving Search Results

After a successful search, users may save the search results they select. Saved search results will be displayed on page “Seyir Defteri”. User may check the checkboxes at the last row of desired search results and click the “Kaydet” button to save the selected results.

**Seyir Defteri**

**BİLETLER**

-	Tarih	Tren No	Kalkış Yeri	Kalkış Saati	Varış Yeri	Varış Saati	Yolculuk Süresi	Ücret	Aktarma
<input type="checkbox"/>	2010-03-16	4	Ankara	10:00:00	Nevşehir	11:00:00	01:00	8.0	-
<input type="checkbox"/>	2010-03-16	10	Nevşehir	11:00:00	Kayseri	12:00:00	01:00	12.0	-
<b>Özet:</b>	2010-03-16	-	Ankara	10:00:00	Kayseri	12:00:00	02:00	20.0	1

**SEFERLER**

-	Tarih	Tren No	Kalkış Yeri	Kalkış Saati	Varış Yeri	Varış Saati	Yolculuk Süresi	Ücret	Aktarma
<input type="checkbox"/>	2010-03-30	1	Cankiri	13:30:00	Corum	14:30:00	01:00	12.0	-
<input type="checkbox"/>	2010-03-30	1	Corum	19:00:00	Tokat	20:00:00	01:00	8.0	-
<b>Özet:</b>	2010-03-30	-	Cankiri	13:30:00	Tokat	20:00:00	06:30	20.0	0

-	Tarih	Tren No	Kalkış Yeri	Kalkış Saati	Varış Yeri	Varış Saati	Yolculuk Süresi	Ücret	Aktarma
<input type="checkbox"/>	2010-03-19	3	Ankara	13:00:00	Yozgat	14:00:00	01:00	12.0	-
<input type="checkbox"/>	2010-03-19	12	Yozgat	15:00:00	Corum	16:00:00	01:00	32.0	-

Figure 4: Tickets and Saved Search Results

Saved search results can be viewed from the “Seyir Defteri” page along with the ones which are converted to tickets.

### 2.2.2. Converting Saved Results into Tickets

After a search result is saved, it can be converted into a ticket. To do that, a search result should be saved first. Earlier saved search results may also be converted into tickets. The desired search results are selected in a similar way described section 2.2.1 and whenever the user clicks the “Bilete dönüştür” button, they are listed in the tickets section of the “Seyir Defteri” page.

### 2.2.3. Cancelling

Saved search results and tickets may also be cancelled. The process is simple, the user selects what he/she wants to cancel and clicks the “İptal et” button of the according section.

## 2.3. Knowledge Database

Another important segment of the system is knowledge database. In that database, there are many different sections such as “Sıkça Sorulan Sorular”, “Genel Sorular/Cevaplar”, “Cevap Bekleyen Sorular”, etc. “Sıkça Sorulan Sorular” section is not subject to modification and edited directly by administrators. Users may add their questions to “Cevap Bekleyen Sorular” section. The questions in that section may be answered only by administrators or users who ask that question. Whenever a question is answered and marked as solved by an administrator, it is with all its answers are moved into “Genel Sorular/Cevaplar” section. The

answers of questions are folded by default and clicking the “cevap” button under any question expands the answer/s of that question.

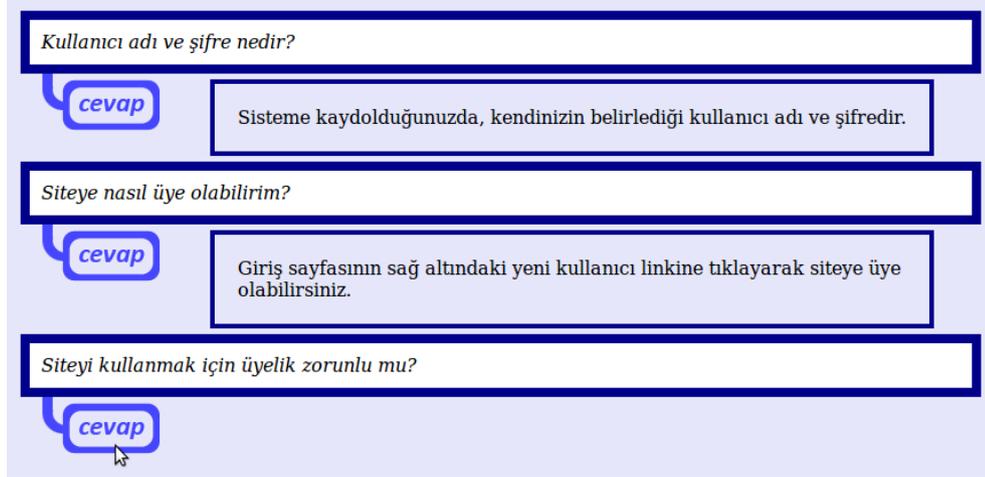


Figure 5 : Frequently Asked Questions

### 2.3.1. Entering a New Question

On the top left corner of the knowledge database page, there is a button labeled as “Yeni Kayıt”. Clicking this button opens a page with a form; users may add new questions into the system by filling this form which contains title, topic and question fields. Clicking “Gönder” button classifies the newly entered question according to its topic and adds the question under appropriate category.

### 2.3.2. Answering a Question

A question, if not under “Sıkça Sorulan Sorular” section, may be answered by administrators or the user who asked the question.



Figure 6 : Answering a Question

Everyone can see the above question but it may be answered by the user “brk” or any administrator. “Cevapla” link is not visible to other users. Clicking this link expands an input field just under the question (or the last answer if there is any). After entering the solution, clicking “Gönder” button adds the solution to database.

## 2.4. Machinist Train Assignments

An important part of the system is the automation of Machinist - Train Assignments. Administrators can access the assignments page by clicking the “Sefer Atama” button on their home page. Just as the page appears, they select a region and the date. Clicking the “Listele” button submits the form and a page with three tables is displayed. These tables contain the idle machinists, machinists with assigned jobs and trains without machinist. According to displayed information, an administrator can match a train with a machinist in either of the following two ways:

- Using the “Tek Sefer Ataması” form. Administrator enters the machinist id and journey id to this form and makes the assignment between them.
- Using the file submit form. Administrator enters a file location, the machinist-journey tuples are assigned to each other.

**Sefer Atama Sayfasına Hoşgeldiniz!**  
Tarihe ve bölgeye göre sefer atamalarını bu sayfadan yapabilirsiniz.

Görev Bölgesi Seçiniz :

Tarih Seçiniz :

**Bu hattaki atama yapılmamış makinistler**

Makinist No	Makinist Adı	Görev Bölgesi
1803	Caner Cakmak	Sivas-Ankara Hattı
1804	Isil Pekel	Sivas-Ankara Hattı
4103	Caner22 Cakmak	Sivas-Ankara Hattı
4104	Isil22 Pekel	Sivas-Ankara Hattı

**Bu hattaki atama yapılmış makinistler**

Makinist No	Makinist Adı	Görev Bölgesi	Sefer Num
Atama yapılmış makinist bulunmamaktadır			

**Bu hattaki atama yapılmamış seferler**

Sefer No	Sefer Adı	Tren No	Tren Adı	Çıkış Saati
2353	Sivas-Ankara Hattı	3	TR003	10:00:00

Tek Sefer Ataması :

Makinist No	Sefer No
<input type="text"/>	<input type="text"/>

Dosyadan Çoklu Atama

Figure 7 : Machinist-Journey Assignment Page

## 2.5. View Assigned Jobs

Whenever a machinist logs into the system, a form with one date field is displayed. When

**Ana Sayfaya Hoşgeldiniz!**

tarihli görev tablonuza bu sayfadan ulaşabilirsiniz.

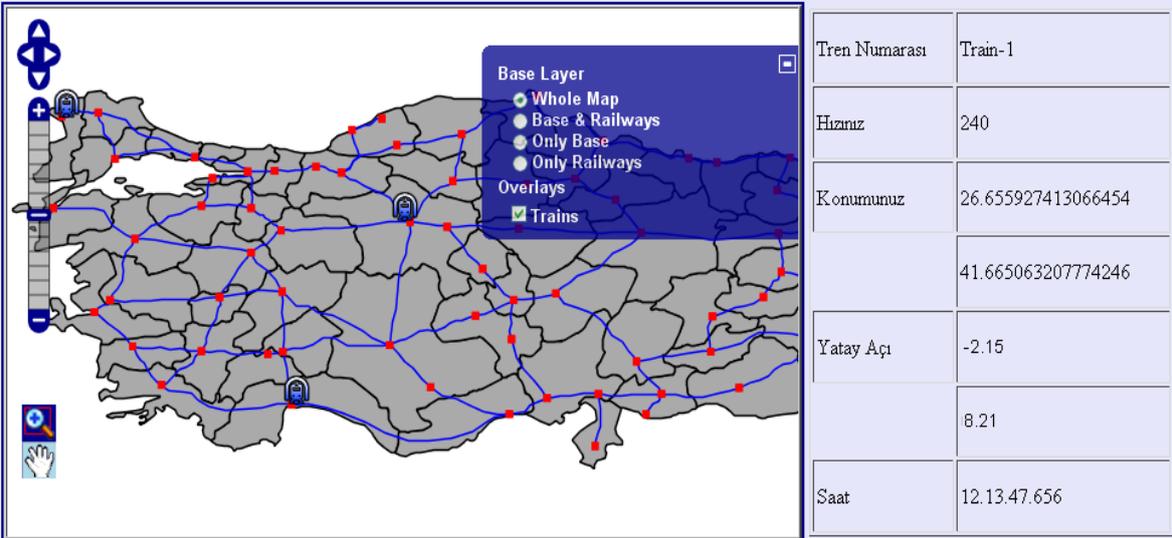
Sefer Num.	Tren Adı	Hat Adı	Kalkış Yeri	Kalkış Saati	Varış Yeri	Varış Saati
2351	TR001	Ankara-Sivas Hattı	Ankara	10:00:00	Tokat	10:30:00
2351	TR001	Ankara-Sivas Hattı	Tokat	10:35:00	Cankiri	11:45:00
2351	TR001	Ankara-Sivas Hattı	Cankiri	11:50:00	Sivas	12:20:00
2352	TR002	Ankara-Sivas Hattı	Ankara	20:00:00	Tokat	20:30:00
2352	TR002	Ankara-Sivas Hattı	Tokat	21:35:00	Cankiri	21:45:00
2352	TR002	Ankara-Sivas Hattı	Cankiri	22:50:00	Sivas	23:20:00

Figure 8 : Machinist Task List

the machinist enters the date, the jobs assigned to him/her on that date are ordered by time and listed in tabular form. He can also access his/her past schedules.

## 2.6. Train Tracking

**Tren Takip Sistemi**



Tren Numarası	Train-1
Hızınız	240
Konumunuz	26.655927413066454 41.665063207774246
Yatay Açı	-2.15 8.21
Saat	12.13.47.656

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Figure 9 : Train Tracking

Train tracking system may be reached following the “Tren Takip Sistemi” button on the left menu.

All users can see the system and follow desired trains. On the right side, information for the selected train can be seen. Information is received from the simulation module. In simulation module the stations on the route are entered. Module produces the coordinates by looking at the shapefiles for the railways. Angles are calculated from the accelerometer data coming from another port. On the left the map is shown and the trains are marked on the map. The train icons move by updating the coordinate values with incoming data. The map has navigation and zoom panels, but these features can be used by mouse click&drag, double-click or mouse wheel. On the right of the map there is a plus sign. When user clicks on it, a small window is opened. User can select the layers to be shown from there. The accelerometer data can also be simulated in the simulation module by reading from a file.