Talha Vawda

IT PAT

Phase 2

Grade 12 (2017)

Adventure Land

Amusement Park

Table of Contents

User Requirements

Role, Activity, Requirements and Limitations

Administrator

ROLE	Manage the park, staff and rides

ACTIVITY	• Login
	• Manage Staff (Admin + Employee) Information
	  ➢ View staff information
	  ➢ Update staff information
	  ➢ Add staff
	  ➢ Remove Staff
	• Manage Ride Information
	  ➢ View ride information
	  ➢ Update Ride Information
	  ➢ Add Rides
	  ➢ Delete Rides
	• View Report and Analysis
	  ➢ View Sales
	  ➢ View statistics (revenue etc.)
	  ➢ View Feedback/Ratings
	  ➢ View graphs
	• View and edit amusement park details
	  ➢ Update Ticket Prices
	  ➢ Update Park Information
	  ➢ Update Park Times

REQUIREMENTS	• Password-controlled account • Full access to all staff and ride details • Administrative tools to view Report and Analysis
LIMITATIONS	• Doesn't have the ability to generate tickets • Cannot provide park feedback

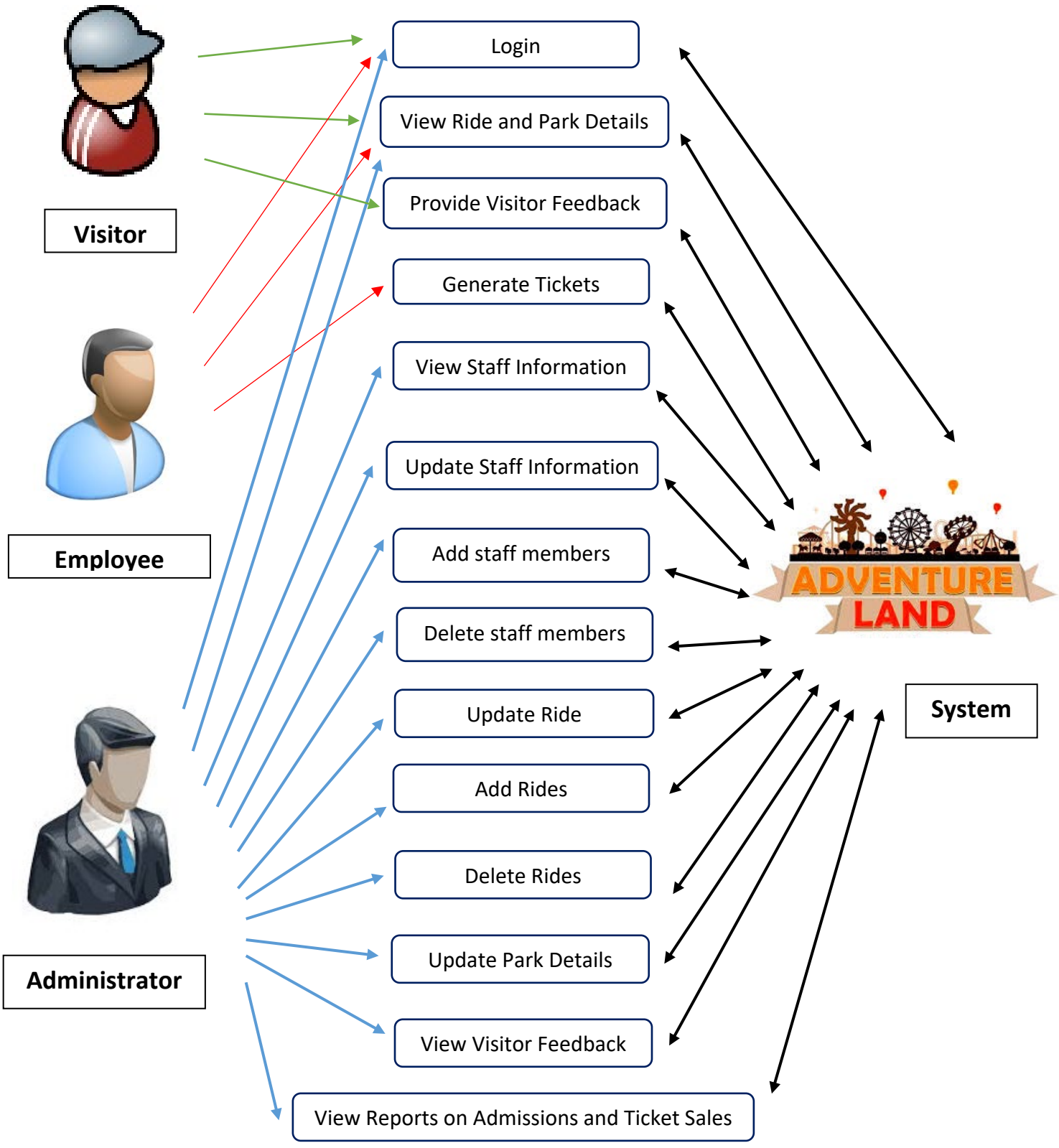
Employee

ROLE	Generate tickets and view park details
ACTIVITY	• Login • Generate entrance tickets • Generate rides tickets • View Ride Information • View amusement park details
REQUIREMENTS	• Password-controlled account
LIMITATIONS	Limited access • Cannot view and edit Staff Information • Cannot edit Ride Information • Cannot access reports and analysis • Cannot provide park feedback • Cannot edit park information

Visitor

ROLE	View information about the amusement park and provide feedback about the park
ACTIVITY	• View information Screen ➢ View Amusement Park details ➢ View Ride Information ➢ Provide feedback about the park ➢ Rate the rides
REQUIREMENTS	• Ticket number
LIMITATIONS	Limited access ➢ Cannot view and edit staff information ➢ Cannot edit Ride Information ➢ Cannot access reports and analysis ➢ Cannot Generate Tickets ➢ Cannot edit park information

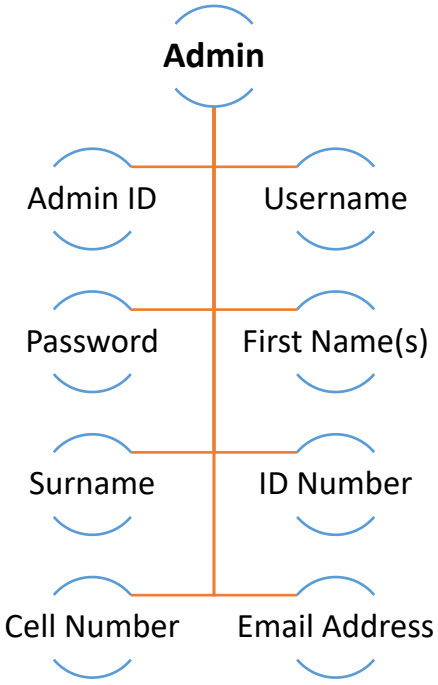
Use Case Diagram



Data Design Specifications

Database Design

Table 1: Admin



Field Name	Description	Data Type	Field Size
Admin ID	Administrator's ID which will uniquely identify each administrator.	AutoNumber	Long Integer
Username	Administrator's Username	Short Text	20
Password	Administrator's Password	Short Text	15
First Name(s)	Administrator's First Name(s)	Short Text	30
Surname	Administrator's Surname	Short Text	30
ID Number	Administrator's South African ID number	Short Text	13
Cell number	Administrator's Cellphone number	Short Text	10
Email address	Administrator's Email address	Short Text	30

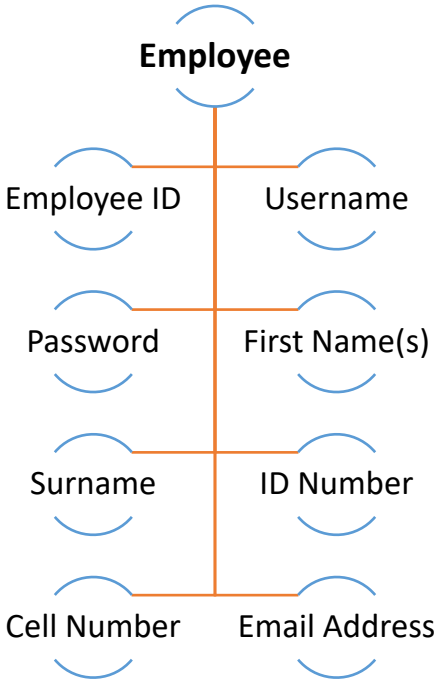
PRIMARY KEY: Admin ID

FOREIGN KEY: None

The purpose of the table is to keep information related to the administrators of the application.

Gender and Date of Birth can be derived from the ID number

Table 2: Employee



Field Name	Description	Data Type	Field Size
Employee ID	Employee's ID which will uniquely identify each Employee.	AutoNumber	Long Integer
Username	Employee's Username	Short Text	20
Password	Employee's Password	Short Text	15
First Name(s)	Employee's First Name(s)	Short Text	30
Surname	Employee's Surname	Short Text	30
ID Number	Employee's South African ID number	Short Text	13
Cell number	Employee's Cellphone number	Short Text	10
Email address	Employee's Email address	Short Text	30

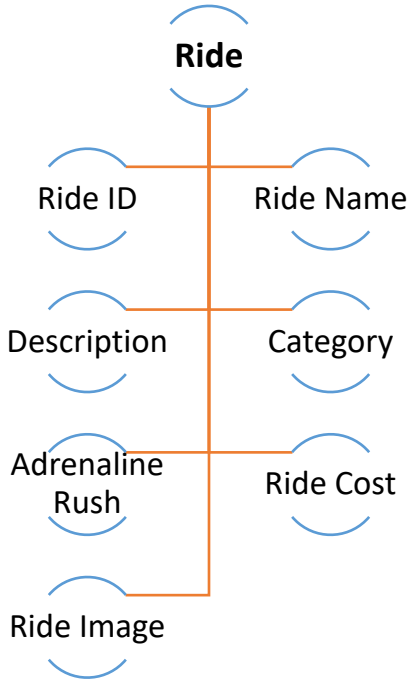
PRIMARY KEY: Employee ID

FOREIGN KEY: None

The purpose of the table is to keep information related to the staff members (employees) of the application.

Gender and Date of Birth can be derived from the ID number

Table 3: Ride



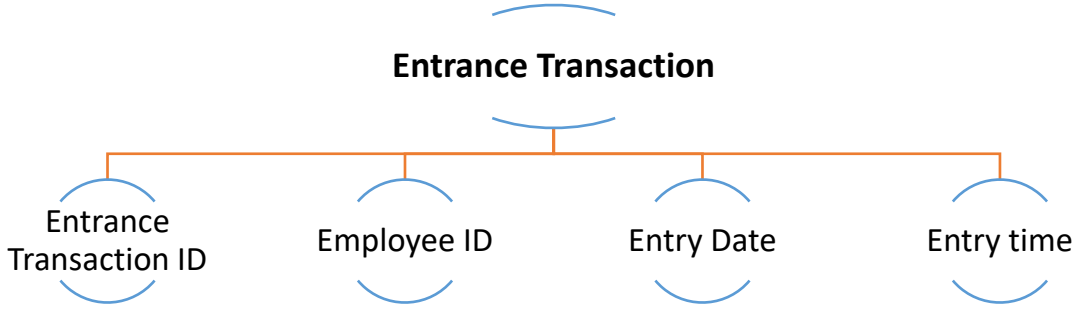
Field Name	Description	Data Type	Field Size
Ride ID	Ride ID that will uniquely identify each ride	AutoNumber	Long Integer
Ride Name	The name of the ride	Short Text	30
Description	The Ride's Description	Long Text	-
Category	The Ride Category – Toddler/Child/Adult/Family	Short Text	7
Adrenaline Rush	The ride 'excitement' rating (From 0 to 10)	Short Text	2
Ride Cost	Ride Cost is the number of Ride Tickets needed to go on the ride	Short Text	3
Ride Image	The picture of the ride	OLE Object	-

PRIMARY KEY: Ride ID

FOREIGN KEY: None

The purpose of the table is to keep information related to the rides at the amusement park.

Table 4: Entrance Transaction



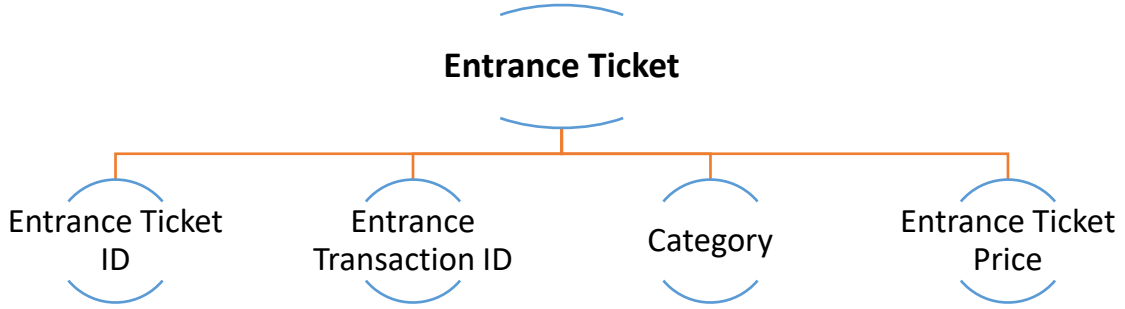
Field Name	Description	Data Type	Field Size
Entrance Transaction ID	Entrance Transaction ID that will uniquely identify each entrance transaction that takes place	AutoNumber	Long Integer
Employee ID	The Employee ID of the employee that conducted the transaction	Number	Long Integer
Entry Date	The date that the entrance transaction took place	Date/Time	-
Entry Time	The time at which the entrance transaction took place	Date/Time	-

PRIMARY KEY: Entrance Transaction ID

FOREIGN KEY: Employee ID

The purpose of the table is to record all the entrance transactions that take place.

Table 5: Entrance Ticket



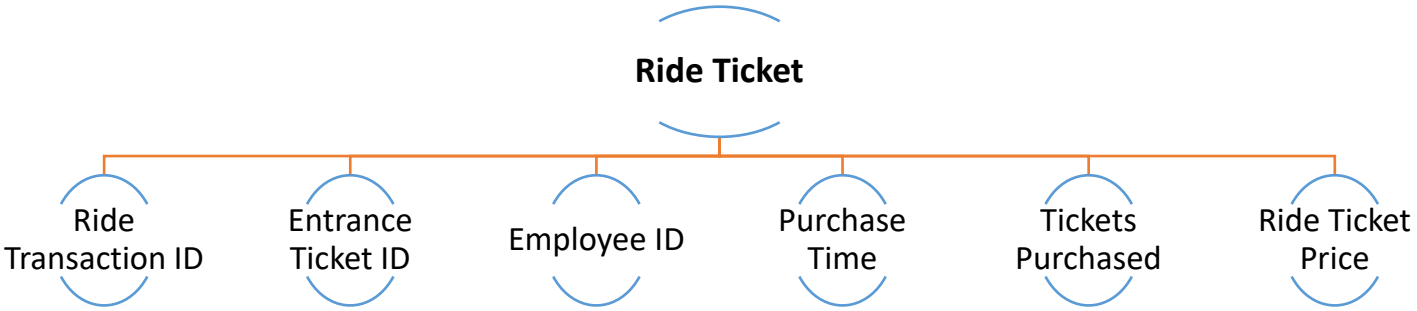
Field Name	Description	Data Type	Field Size
Entrance Ticket ID	Entrance Ticket ID that will uniquely identify each entrance ticket	AutoNumber	Long Integer
Entrance Transaction ID	The entrance transaction that the ticket is linked to	Number	Long Integer
Category	The Entrance Ticket Category – Toddler/Child/Adult	Short Text	7
Entrance Ticket Price	The sale price of the entrance ticket	Currency	Long Integer

PRIMARY KEY: Entrance Ticket ID

FOREIGN KEY: Entrance Transaction ID

The purpose of the table is to record all the entrance tickets that have been issued.

Table 6: Ride Ticket



Field Name	Description	Data Type	Field Size
Ride Transaction ID	Ride Transaction ID that will uniquely identify each ride transaction that takes place	AutoNumber	Long Integer
Entrance Ticket ID	The Entrance Ticket that the ride transaction is linked to	Number	Long Integer
Employee ID	The Employee ID of the employee that conducted the transaction	Number	Long Integer
Purchase Time	The time at which the ride transaction took place	Date/Time	-
Tickets Purchased	The number of ride tickets purchased in the transaction	Short Text	3
Ride Ticket Price	The sale price of one ride ticket	Currency	-

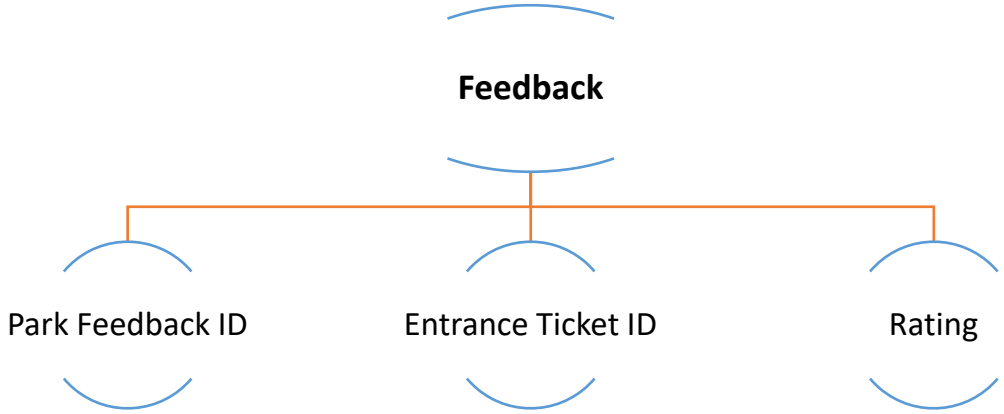
PRIMARY KEY: Ride Transaction ID

FOREIGN KEY: Entrance Ticket ID, Employee ID

The purpose of the table is to record all the ride tickets issued

Entrance Ticket is a day-pass only so the Ride Transaction will always take place on the same day as the Entrance Transaction. The Ride Transaction is linked to the Entrance Transaction so there is no need to put the date for the Ride Transaction

Table 7: Feedback



Field Name	Description	Data Type	Field Size
Feedback ID	Park Feedback ID that will uniquely identify each Park Feedback	AutoNumber	Long Integer
Entrance Ticket ID	The Entrance Ticket that provided the park feedback	Number	Long Integer
Category	The Feedback Category. Park Feedback or Ride Feedback	Short Text	13
Rating	The feedback rating (from 0 to 10)	Short Text	2
Ride ID	The ride that the feedback rating is on	Number	Long Integer

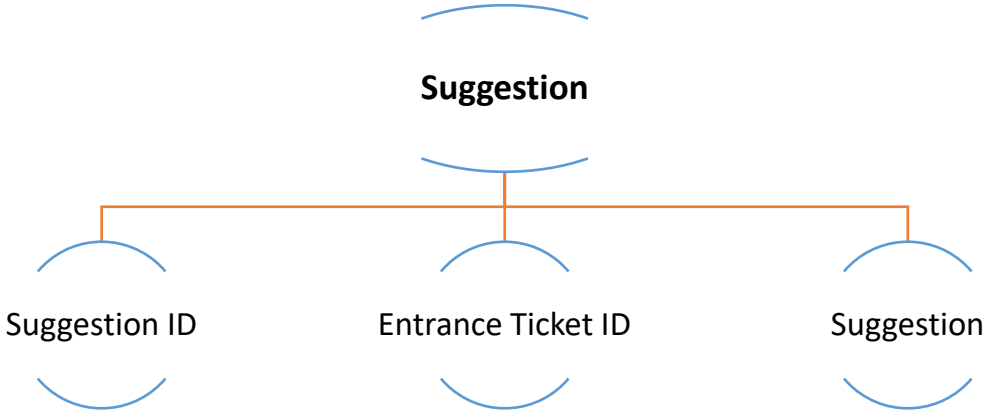
PRIMARY KEY: Park Feedback ID

FOREIGN KEY: Entrance Ticket ID, Ride ID

The purpose of the table is to record all the park and ride feedback that has been provided by the visitors.

Field Ride ID will only be populated when the category is Ride Feedback

Table 8: Suggestion



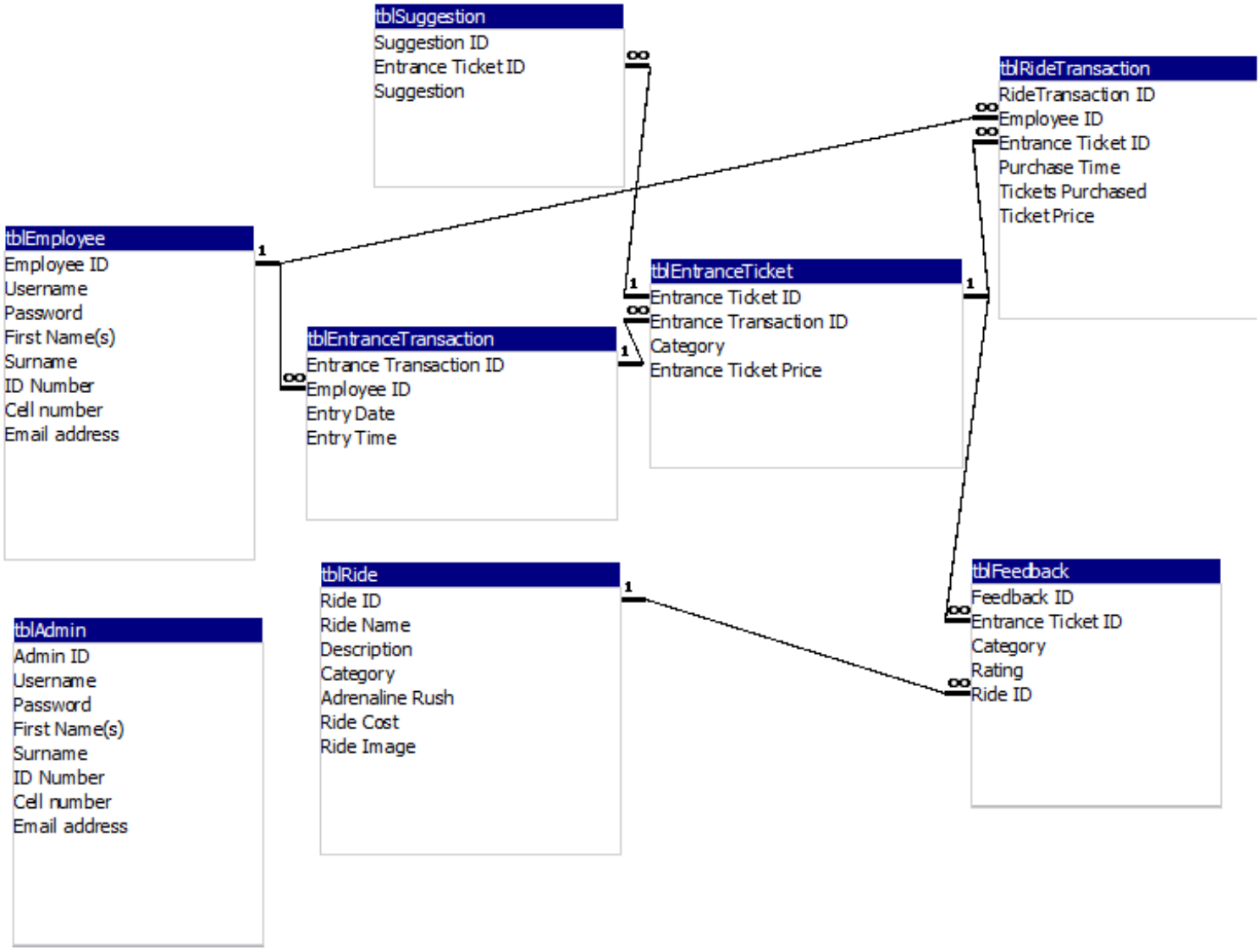
Field Name	Description	Data Type	Field Size
Suggestion ID	Suggestion ID that will uniquely identify each Suggestion	AutoNumber	Long Integer
Entrance Ticket ID	The Entrance Ticket that provided the suggestion	Number	Long Integer
Suggestion	The suggestion content	Long Text	-

PRIMARY KEY: Suggestion

FOREIGN KEY: Entrance Ticket ID

The purpose of the table is to record all the suggestions that has been provided by the visitors.

Entity Relationship Diagram



Data Dictionary

String – Short Text Data Type combination of keyboard characters

Alphabets – Short Text Data Type with letters of Alphabet only

Digits – Short Text Data Type with numbers only which is entered by user

Number – Number Data Type for Foreign Keys

Table Name	Field Name	Primary Key	Foreign Key	Data Type	Field Size	Input Mask	Valid Values/ Format
Admin	Admin ID	✘		Auto Number	Long Integer		Numbers (Computer Generated)
	Username			Short Text	20		String
	Password			Short Text	15		String
	First Name(s)			Short Text	30		Alphabets
	Surname			Short Text	30		Alphabets
	ID Number			Short Text	13	0000000000000	Digits
	Cell number			Short Text	10	000 000 0000	Digits
	Email address			Short Text	30		String
Employee	Employee ID	✘		Auto Number	Long Integer		Numbers (Computer Generated)
	Username			Short Text	20		String
	Password			Short Text	15		String
	First Name(s)			Short Text	30		Alphabets
	Surname			Short Text	30		Alphabets
	ID Number			Short Text	13	0000000000000	Digits
	Cell number			Short Text	10	000 000 0000	Digits
	Email address			Short Text	30		String
Ride	Ride ID	✘		Auto Number	Long Integer		Numbers (Computer Generated)
	Ride Name			Short Text	30		Alphabets
	Description			Long Text	-		String
	Category			Short Text	7		Alphabets
	Adrenaline Rush			Short Text	2	09	Digits
	Ride Cost			Short Text	3	099	Digits

	Ride Image			OLE Object	-		OLE Object
Entrance Transaction	Entrance Transaction ID	✘		Auto Number	Long Integer		Number (Computer Generated)
	Employee ID		✘	Number	Long Integer		Number
	Entry Date			Date/Time	-	00 >L<LL 0000	Date
	Entry Time			Date/Time	-	00:00:00;0;_	Time
Entrance Ticket	Entrance Ticket ID	✘		Auto Number	Long Integer		Numbers (Computer Generated)
	Entrance Transaction ID		✘	Number	Long Integer		Number
	Category			Short Text	7		Alphabets
	Entrance Ticket Price			Currency	Long Integer		Currency
Ride Ticket	Ride Transaction ID	✘		Auto Number	Long Integer		Numbers (Computer Generated)
	Entrance Ticket ID		✘	Number	Long Integer		Number
	Employee ID		✘	Number	Long Integer		Number
	Purchase Time			Date/Time	-	00:00:00;0;_	Time
	Tickets Purchased			Short Text	3		Digits
	Ride Ticket Price			Currency	-		Currency
Feedback	Park Feedback ID	✘		Auto Number	Long Integer		Numbers (Computer Generated)
	Entrance Ticket ID		✘	Number	Long Integer		Number
	Category			Short Text	13		Alphabets
	Rating			Short Text	2	09	Digits
	Ride ID		✘	Number	Long Integer		Number
Suggestion	Suggestion ID	✘		Auto Number	Long Integer		Numbers (Computer Generated)

	Entrance Ticket ID		✘	Number	Long Integer		Number
	Suggestion			Long Text	-		String

Data Structures

- **TEXT FILES**

  Text files will be used to store ticket prices, park history, park info, park times and help screen information. The program will be able to read from and write to the text files. The use of a text file makes it easy to update information without changing the actual program.

- **ARRAYS**

  Arrays will be used during processing to temporarily hold data, especially results of queries made to the database. This allows the data to be conveniently accessed and manipulated.

- **DATABASE**

  ROLE OF DATABASE

  The use of the database will enable the organization to store more records, while saving space. It also allows for data to be easily filtered and manipulated. This allows filtering through a vast number of records so that meaningful information can be obtained.

  The database will contribute to the solution by serving as a permanent storage location where data can be manipulated and meaningful information can be obtained as a result of processing the data.

  The contents of the database tables will be displayed in appropriate GUI tables (DBGrid) on each screen. The user may navigate, insert, edit and delete records by using the DB Navigator component and other DB components.

  The database will be manipulated in a way that records relating to administrators, employees and rides can be added, edited or deleted. Searching facilities that allows for data to be filtered according to criteria will be provided for.

Inserting new records

- The insert button on the DB Navigator will be used to insert new records.
- Values will be obtained from the DB input components on the screen.
- The tick button on the DB Navigator will be clicked to insert the values.
- These values will undergo validation checks by validation rules, Input Masks and components that have built-in validation.
- If the values are invalid then an appropriate error message will be displayed.
- Once validated, the values will be inserted into the database.

Editing records

- Values will be changed on the DB input components on the screen – which shows the current selected record in the DBGrid.
- The tick button on the DB Navigator will be clicked to insert the values.
- These values will undergo validation checks, and if they are invalid then an appropriate error message will be outputted.
- If the values are invalid then an appropriate error message will be displayed.
- Once validated, the values will be inserted into the database.

Deleting records

- The Delete button on the DBNavigator component will be clicked to delete the current selected record.

CLASSES AND OBJECTS will be used appropriately. Object oriented design will be employed, thus minimizing the unnecessary repetition of code. The uses of specialized classes for tasks such as validation and obtaining the date and time allows for the use across different classes and forms, simplifying coding processes.

IPO Design Specifications

Input Requirements

Data will be obtained from the following sources:

- GUI components (Mouse/Keyboard)
- Text Files
- Arrays
- Database Tables

- Primary Keys are Computer-Generated
- Entrance Transaction, Entrance Ticket, Ride Transaction and Ride Ticket tables' records are computer generated

Database Related

- Field Sizes are specified in Data Dictionary.

String – Short Text Data Type combination of keyboard characters

Alphabets – Short Text Data Type with letters of Alphabet only

Digits – Short Text Data Type with numbers only which is entered by user

Number – Number Data Type for Foreign Keys

Table Name	Field Name	GUI Component	Source of Input	Format of Input	Example of Input
Admin	Username	DBEdit	Keyboard	String	talhavawda
	Password	DBEdit	Keyboard	String	admin
	First Name(s)	DBEdit	Keyboard	Alphabets	Talha
	Surname	DBEdit	Keyboard	Alphabets	Vawda
	ID Number	DBEdit	Keyboard	Digits	9905215670081
	Cell number	DBEdit	Keyboard	Digits	083 567 7861
	Email address	DBEdit	Keyboard	String	talhavawda@gmail.com
Employee	Username	DBEdit	Keyboard	String	saleemansoor
	Password	DBEdit	Keyboard	String	employee
	First Name(s)	DBEdit	Keyboard	Alphabets	Saleem
	Surname	DBEdit	Keyboard	Alphabets	Mansoor
	ID Number	DBEdit	Keyboard	Digits	8705125798493
	Cell number	DBEdit	Keyboard	Digits	081 343 8535
	Email address	DBEdit	Keyboard	String	saleem10@gmail.com
Ride	Ride Name	DBEdit	Keyboard	Alphabets	Golden Loop
	Description	DBMemo	Keyboard	String	Get ready for the ride of your life and prepare to be rocketed to heights of close to 40 meters at astounding speeds from 0 – 85 kilometres an hour in just 3

					seconds as the Golden Loop takes you through a thrilling 360-degree horizontal loop; but beware what goes up must come down.
	Category	DBComboBox	Mouse	Alphabets	Adult
	Adrenaline Rush	DBComboBox	Mouse	Digits	9
	Ride Cost	DBEdit	Keyboard	Digits	5
	Ride Image	DBImage	Mouse	OLE Object	
Feedback	Rating	SpinEdit	Mouse / Keyboard	Digits	7
	Ride ID	SpinEdit	Mouse / Keyboard	Number	5
Ride Feedback	Ride ID	SpinEdit	Mouse / Keyboard	Number	5
	Rating	SpinEdit	Mouse / Keyboard	Digits	8
Suggestion	Suggestion	Memo	Keyboard	String	I would like the toilet facilities to be cleaned more regularly as they were in unhygienic conditions.

GUI Components

Where input will not be inserted into database.

Form Name	Component Name	GUI Component	Source of Input	Format of Input	Example of Input
Login	Username	ComboBox	Mouse	String	talhavawda
	Password	Edit	Keyboard	String	admin
Visitor Login	Ticket Number	InputBox	Keyboard	Number	43
Admin - Management	Search	Edit	Keyboard	String	Talha
	Filter	RadioGroup	Mouse	String	First Name(s)
Employees - Management	Search	Edit	Keyboard	String	Mansoor
	Filter	RadioGroup	Mouse	String	Surname
Rides - Management	Search	Edit	Keyboard	String	Golden Loop
	Filter	RadioGroup	Mouse	String	Ride Name
Tickets - Management	Adult	SpinEdit	- Text File - Keyboard / Mouse	Digits	3
	Child	SpinEdit	-Text File - Keyboard / Mouse	Digits	2
	Toddler	SpinEdit	-Text File - Keyboard / Mouse	Digits	0
	Ride Ticket Price	SpinEdit	-Text File - Keyboard / Mouse	Digits	5
Park - Management	Park Times	SpinEdit x12	-Text File - Keyboard / Mouse	Digits	14

	Park Info	Memo	- Text File - Keyboard	String	Adventure Land is the most exhilarating amusement park in the southern hemisphere.
Ticket Sales - Reports	Group By	GroupBox x2	Mouse	String	Transaction ID
Graphs - Reports	Display By	GroupBox x2	Mouse	String	Category
Sinking Fund – Reports	Cost of upgrade / new ride	SpinEdit	Keyboard / Mouse	Digits	50000
	Months to pay over	SpinEdit	Keyboard / Mouse	Digits	34
	Interest % per annum	SpinEdit	Keyboard / Mouse	Decimal	7.5
Entrance Tickets	Adults	SpinEdit	Keyboard / Mouse	Digits	4
	Children	SpinEdit	Keyboard / Mouse	Digits	0
	Toddlers	SpinEdit	Keyboard / Mouse	Digits	2
Ride Tickets	Entrance Ticket ID	ComboBox	Keyboard	Number	2
	N.o of Ride Tickets	SpinEdit	Keyboard / Mouse	Digits	5
Welcome – Visitor	Park Info	Memo	- Text File	String	Adventure Land is the most exhilarating amusement park in the southern hemisphere.

	Park Times and Ticket Prices	Memo	- Text File	String	Mon-Fri: 08:00 – 15:00
Rides - Visitor	Filter	RadioGroup	Keyboard	String	Adult
	Select a Ride	ComboBox	Keyboard	String	Golden Loop

Processing Requirements

- Admin Login
  - Edit existing Admin details
  - Insert Admin
  - Delete Admin
  - Search Admins
  - Edit Existing Employee details
  - Insert Employee
  - Delete Employee
  - Search Employees
  - Edit existing Ride details
  - Insert Rides
  - Delete Rides
  - Search Rides
  - Edit Entrance Ticket Prices
  - Edit Ride Ticket Prices
  - Edit Park Information
  - Edit Park Times
  - Display all Entrance Tickets
  - Display Entrance Tickets by Category
  - Display all Ride Tickets
  - Display Ride Tickets by Category
  - Display Average Rating for Ride Feedback
  - Display Average Rating for Park Feedback
  - Display Entrance Ticket Sales graphs by Category
  - Display Ride Ticket Sales graphs by Category
  - Display Statistics
  - Calculate amount to save monthly for upgrades / new rides

- Employee Login
  - Generate Entrance Tickets
  - Generate Ride Tickets
  - Display Rides by Category

- Visitor Login
  - Display Rides by Category
  - Provide Park Feedback
  - Provide Ride Feedback
  - Provide Suggestions

SQL Statements

I will make use of the following SQL Statements to do the required Processing:

- SELECT FROM: to display fields from the tables in the database
- DISTINCT: to get distinct data from a table – no duplicates
- WHERE: used to conditionally select data.
- ORDER BY: to sort the table in ascending or descending order
- GROUP BY: Groups tables' information together for statistics and results purposes.
- ROUND: to round off results
- INT: to convert result to an integer
- SUM: to get the sum of data values in a table
- AVG: to get the average of the data values in a table
- COUNT: to get the number of records in a table
- YEAR, MONTH, DATE: date functions

- Fields will be inserted, deleted and updated by use of the DBNavigator

Calculations

- Calculate the total cost of an Entrance transaction
- Calculate the total cost of a Ride transaction
- Determine the Modal (most popular) Category
- Determine the least popular category
- Calculate amount to save monthly for upgrades or new rides (sinking fund)

Output Requirements

- Display all screens
  - Splash Screen
  - Home Screen
  - About Screen
  - Login – Admin
  - Home – Admin
  - Admin – Management
  - Employee – Management
  - Ride – Management
  - Ticket – Management
  - Park – Management
  - Ticket Sales – Reports
  - Statistics – Reports
  - Feedback – Reports
  - Graphs – Reports
  - Sinking Fund – Reports
  - Login – Employee
  - Home – Employee
  - Entrance Tickets – Employee
  - Ride Tickets – Employee
  - Park Info – Employee
  - Login – Visitor
  - Welcome – Visitor
  - Rides – Visitor
  - Feedback – Visitor

All data displayed in an Edit is of format 'string'

Output	Output Method	Format	GUI Component	Example of Output
Date and Time	Screen	String DD MMM YYYY HH:MM:SS	Label	07 May 2017 15:30:27
Admin Username	Screen	String	Label	Admin: Talha
Employee Username	Screen	String	Label	Employee: Talha
Visitor Ticket Number	Screen	String	Label	Ticket Number: TE123
Admin Table	Screen	Number String Alphabet Digit	DBGrid	
Admin Details	Screen	String	Admin ID (DBEdit)	2
	Screen	String	Username (DBEdit)	talhavawda
	Screen	String	Password (DBEdit)	admin
	Screen	String	First Name(s) (DBEdit)	Talha
	Screen	String	Surname (DBEdit)	Vawda
	Screen	String	ID Number (DBEdit)	9905215670081

	Screen	String	Cell number (DBEdit)	083 567 7861
	Screen	String	Email address (DBEdit)	talhavawda@gmail.com
Employee Table	Screen	Number String Alphabet Digit	DBGrid	
Employee Details	Screen	String	Employee ID (DBEdit)	7
	Screen	String	Username (DBEdit)	ahmadjshah
	Screen	String	Password (DBEdit)	Ajs1801
	Screen	String	First Name(s) (DBEdit)	Ahmad Jawaad
	Screen	String	Surname (DBEdit)	Shah
	Screen	String	ID Number (DBEdit)	0001185630083
	Screen	String	Cell number (DBEdit)	073 527 8363
	Screen	String	Email address (DBEdit)	Ahmadj1801@gmail.com
Ride Table	Screen	String Alphabet Digit OLE Object	(DBEdit)	
Ride Details	Screen	String	Ride ID (DBEdit)	5
	Screen	String	Ride Name (DBEdit)	Golden Loop
	Screen	String	Category (DBComboBox)	Adult
	Screen	String	Adrenaline Rush (DBComboBox)	8
	Screen	String	Ride Cost (DBEdit)	5 ride tickets
	Screen	String	Description (DBMemo)	Get ready for the ride of your life and prepare to be rocketed to heights of close to 40 meters at astounding speeds from 0 – 85 kilometres an hour in just 3 seconds as the Golden Loop takes you through a thrilling 360-degree horizontal loop; but beware what goes up must come down.

	Screen	OLE Object	Ride Picture (DBImage)	
	Screen			
Ticket Prices	Text File	String	-	
Park Info	Text File	String	-	
Park Times	Text File	String	-	
Entrance Ticket Sales	Screen	Number String Date Currency	DBGrid	
Ride Ticket Sales	Screen	Number Date Currency	DBGrid	
Statistics	Screen	String Currency	Edit x 25	
Ride Feedback	Screen	Number Alphabet Digit Decimal	DBGrid	
Park Feedback	Screen	String	N.o. of votes (Edit)	21
			Average Rating (Edit)	8.3
Suggestions	Screen	Number String	DBGrid	
	Screen		Suggestion ID (DBEdit)	32
	Screen		Suggestion (DBMemo)	The toilets are in a deplorable condition and are not maintained well. Please fix this problem.
Graphs	Screen	-	Chart x2	
Receipt	Screen	String String	Memo Text File	Date: 07 May 2017 Time: 15:34:21 Entrance Ticket ID: 574 Employee: John Tickets Purchased: 7 Total Amount Due: R140.00
	Printer			
Rides	Screen	String OLE Object	DBGrid	
	Screen	String	Ride Name (Label)	Golden Loop

	Screen	String	Category (Edit)	Adult
	Screen	String	Adrenaline Rush (Edit)	8
	Screen	String	Ride Cost (Edit)	5 ride tickets
	Screen	String	Ride Description (Memo)	Get ready for the ride of your life and prepare to be rocketed to heights of close to 40 meters at astounding speeds from 0 – 85 kilometres an hour in just 3 seconds as the Golden Loop takes you through a thrilling 360-degree horizontal loop; but beware what goes up must come down.
	Screen	OLE Object	Ride Image (Image)	

Validation and Error Messages

Tables

- Methods will be written using a While loop to repeatedly ask the user for correct input in the event that data is entered incorrectly or is in an incorrect format
- Messages dialogs will be used to inform the user of any error that occurs and suggestions will be made to facilitate correct input
- Primary Keys are computer-generated and thus do not require validation.
- For fields where values entered are digits, the validation is done by the Input Mask therefore there is no need for a validation rule to validate the number of characters entered or that the values entered are digits.

Table 1: Admin

Field Name	Validation	Error Message
Username	– Must not be empty – Must contain at least 5 characters	– Username must contain at least 5 characters
Password	– Must not be empty – Must contain at least 6 characters	– Password must contain at least 6 characters
First Name(s)	– Must not be empty – Must contain alphabets only	– Please enter a correct name
Surname	– Must not be empty – Must contain alphabets only	– Please enter a correct surname
ID Number	– Must not be empty	– Please enter a valid ID number
Cell number	– Must not be empty – First digit must be a zero (0)	– Please enter a valid cell number
Email address	– Must not be empty – Must contain '@' symbol – Must contain '.' symbol	– Please enter a valid email address

Table 2: Employee

Field Name	Validation	Error Message
Username	– Must not be empty – Must contain at least 5 characters	– Username must contain at least 5 characters
Password	– Must not be empty – Must contain at least 6 characters	– Password must contain at least 6 characters
First Name(s)	– Must not be empty – Must contain alphabets only	– Please enter a correct name
Surname	– Must not be empty – Must contain alphabets only	– Please enter a correct surname
ID Number	– Must not be empty	– Please enter a valid ID number
Cell number	– Must not be empty – First digit must be a zero (0)	– Please enter a valid cell number
Email address	– Must not be empty – Must contain '@' symbol – Must contain '.' symbol	– Please enter a valid email address

Table 3: Ride

- Category and Adrenaline Rush are selected from Combo Box therefore no validation rule needed.
- Ride Cost can be 0 (free).

Field Name	Validation	Error Message
Ride Name	– Must not be empty – Must contain alphabets only	– Please enter a Ride Name
Description	– Must not be empty	– Please provide a description
Category	– Must not be empty	– Please select a category
Adrenaline Rush	– Must not be empty	– Please select a value
Ride Cost	– Must not be empty – Must be digits only	– Please fill in this field and enter digits only

Table 4: Entrance Transaction

- No validation rule needed because record is dynamically populated.
  - Employee ID is of current employee logged in. Has to be in existence.
  - Entry Date and Time is current system Date and Time and matches the Input Masks.
  -

Table 5: Entrance Ticket

- No validation rule needed because the record is dynamically populated.
  - Entrance Transaction ID is generated by database for current transaction.
  - Category is selected from Combo Box.
  - Entrance Ticket price is read-in from a text file.

Table 6: Ride Ticket

- No validation rule needed because the record is dynamically populated.
  - Employee ID is of current employee logged in. Has to be in existence.
  - Purchase Time is current system Time and matches the Input Mask.
  - Ride Ticket price is read-in from a text file.

Table 7: Feedback

- No validation rule needed because the record is dynamically populated.
  - Entrance Ticket ID is Ticket ID logged in with. Has to be in existence.
  - Category will be determined using coding (which button was selected)
  - Rating is read-in from spinner (SpinEdit)
  - Ride Name is selected from Combo Box. Wil get Ride ID using SQL.

Table 8: Suggestion

- No validation rule needed for Entrance Ticket ID because it is Ticket ID logged in with. Has to be in existence.

Field Name	Validation	Error Message
Suggestion	– Must not be empty	– Please provide a suggestion

Human Computer Interaction and Graphical User Interface Design Considerations

The software application will be Graphical User Interface (GUI) based, and will make use of Delphi code and the embedded database.

Queries will be made via the GUI to the database by use of SQL statements.

The application will be user friendly and the design will be utilitarian-based (practical and functional design over an attractive design) and the GUI is easy-navigable.

The GUIs will be placed such that it promotes a smooth flow on the screen.

Components will be strategic placed and be of an appropriate size.

Text Input will be minimised by using various components that will make input easier.

Appropriate icons and pictures will be used related to the scenario.

Screen space will be utilized and components won't be cluttered.

Help screens will explain to the user each section of the application and will guide the user as to the format of input for the data. The help content will be associated with the specific screen (form) and tabsheet the user is currently on.

Hint (Tooltips) and Text Hint properties will be enabled for components to guide the user.

The application has an effective means of error-handling (validation) and will display appropriate error messages when applicable.

The application will interact with the user via various dialogue boxes such as InputBox, MessageDlg or by directing them to a new screen (TForm).

Messages will be communicated to the user whenever changes or errors are made.

The user will have the option on each screen (Form) to either exit the application gracefully or to go back to previous screen (Form) by means of BitBtn's.

User access and limitations will be controlled by means of user accounts and passwords to protect the integrity of the data in the database.

Components used

- TForm
- TAboutBox
- TPageControl
- TPanel
- TDBGrid
- TDBNavigator
- TDBEdit
- TDBComboBox
- TDBImage
- TDBMemo
- TGroupBox
- TLabel
- TEdit
- TSpinEdit
- TButton
- TBitBtn
- TRadioGroup
- TCheckBox
- TComboBox
- TMemo
- TRichEdit
- TImage
- TTimer
- TProgressBar

Basic Graphical User Interface (GUI) Designs

Splash Screen

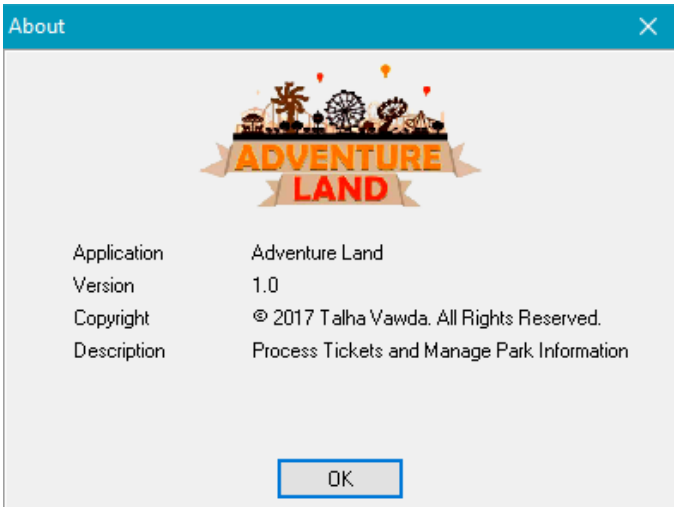
The Splash Screen is the starting screen of the application. A timer controls the progress bar and the loading percentage is displayed.

Home Screen

The Home Screen allows a user to log into his account. The user will click on an image of the respective account type to proceed to the login screen. The date, time, help and exit buttons are placed on a panel and are on every form. The about button to view the About Screen is situated only on the Home Screen

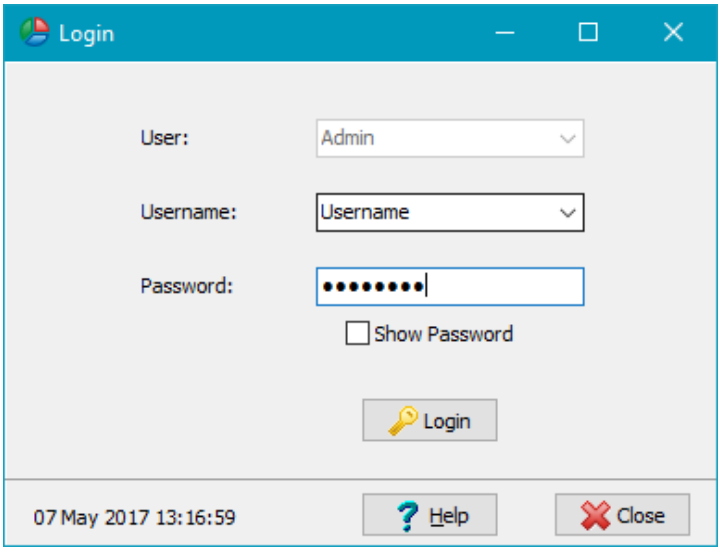
About Screen

The About screen provides information about the application.



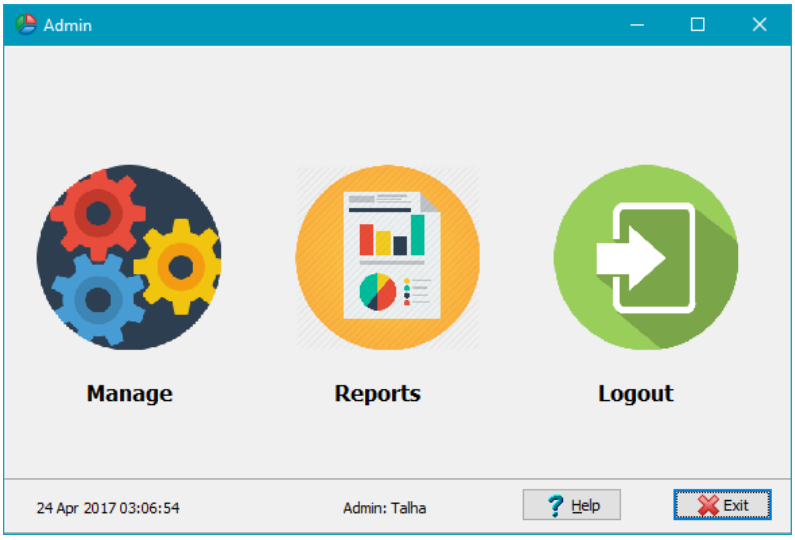
Login – Admin

This screen allows the admin to log in. The admin selects his username from the Combo Box and enters his password. If the password is correct for the respective username, the admin will be able to proceed to the Admin Home Screen otherwise an error message will be displayed and the admin will have to re-enter his password. Three incorrect entries will result in the user being redirected to the Home Screen.



Home – Admin

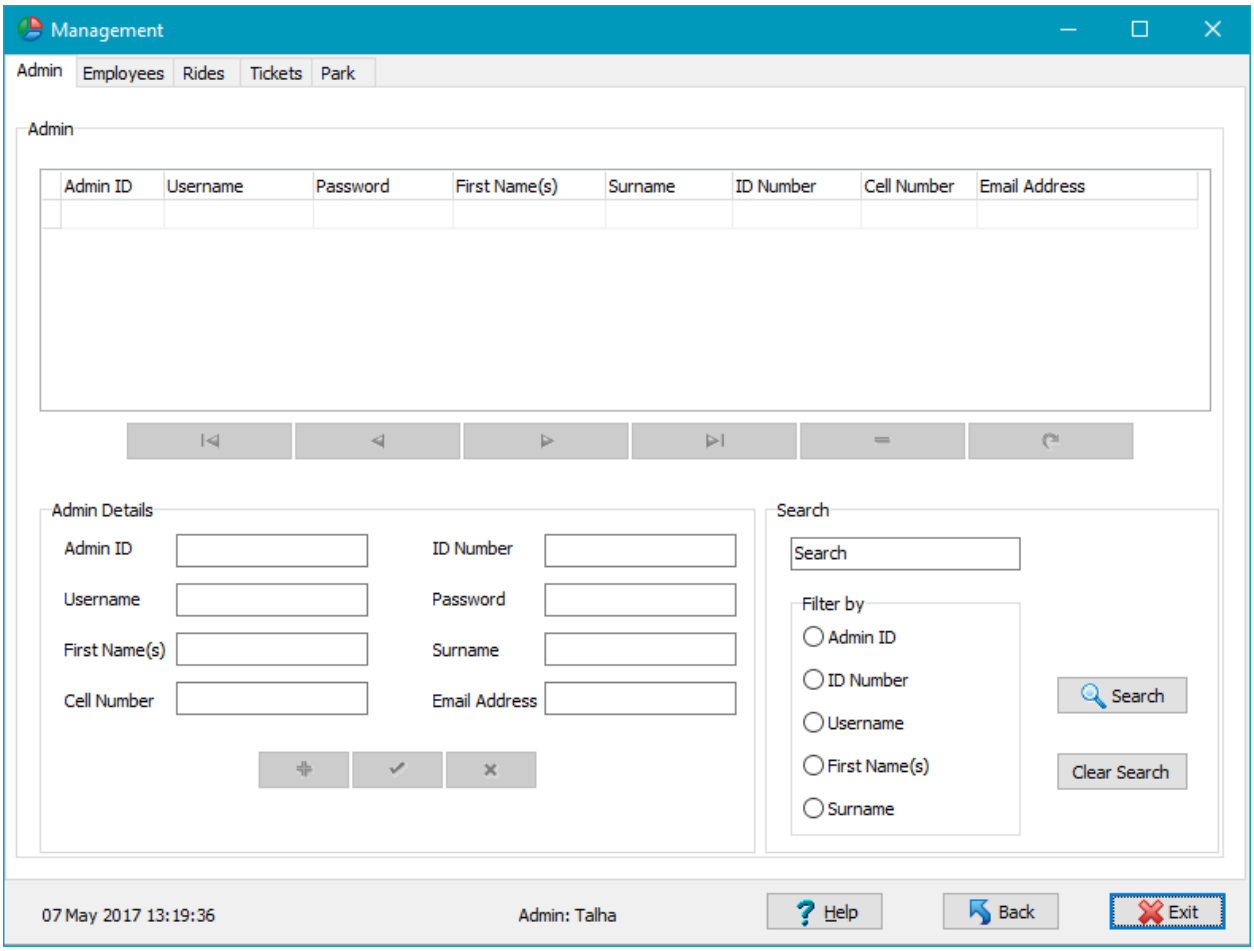
This is the Admin Home Screen. The admin will be able to go to the Management screen, Reports screen or Logout by clicking on the respective icon. The admin's username is displayed on the menu panel.



Admin – Management

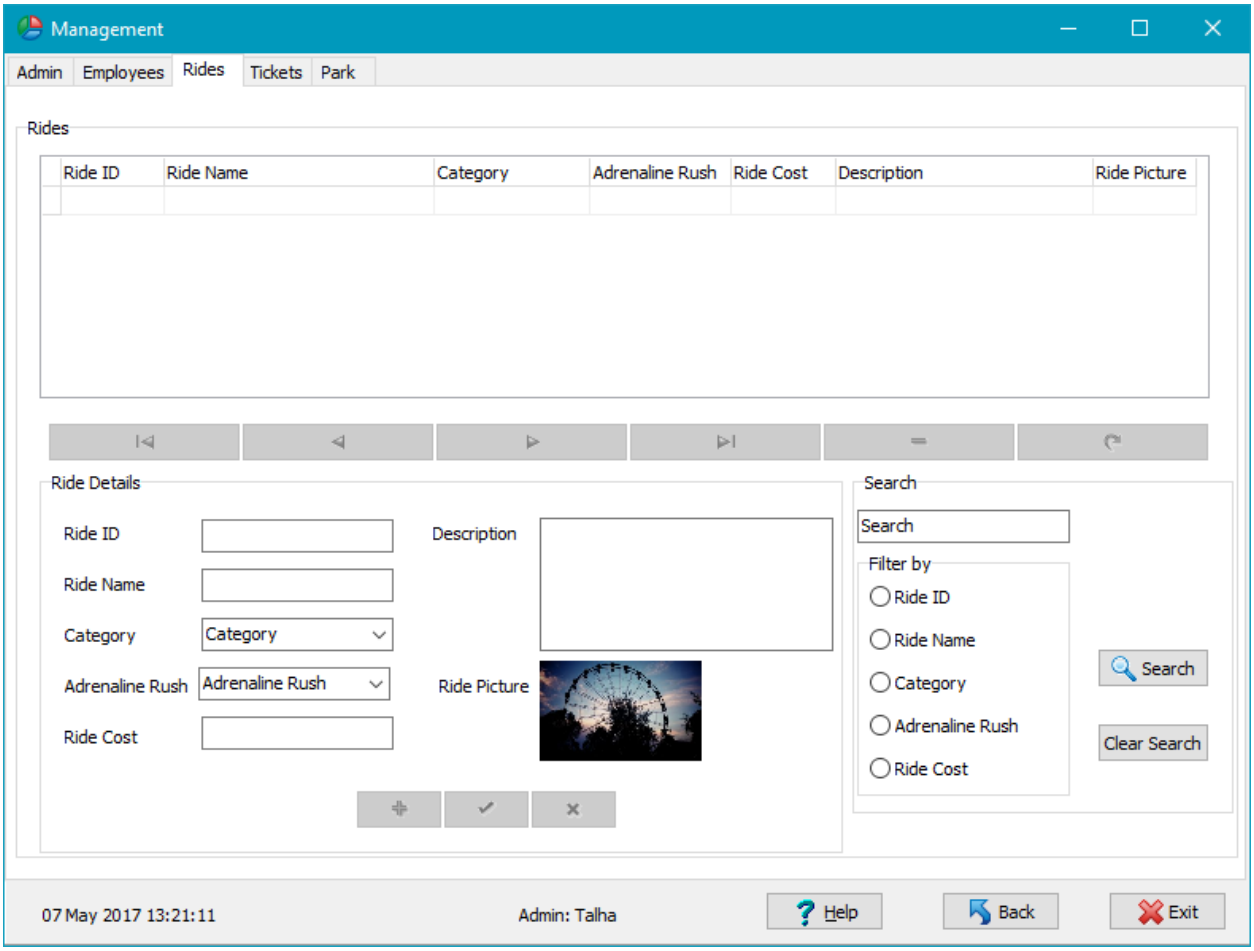
The tabsheet allows the user to easily switch between different management options.

This screen allows the user to manage the administrators of the application. The table (DBGrid) displays the records of the admin table in the database. The edit's are connected to the table (DBEdit) and displays data for the current selected record. The user can view and edit admin details and delete admins by use of the DBNavigator component and the Admin Details Group Box. He can add an admin by use of the DBNavigator inside the Admin Details Group Box. The admin will also be able to search admins by the criteria provided by use of SQL Statements.



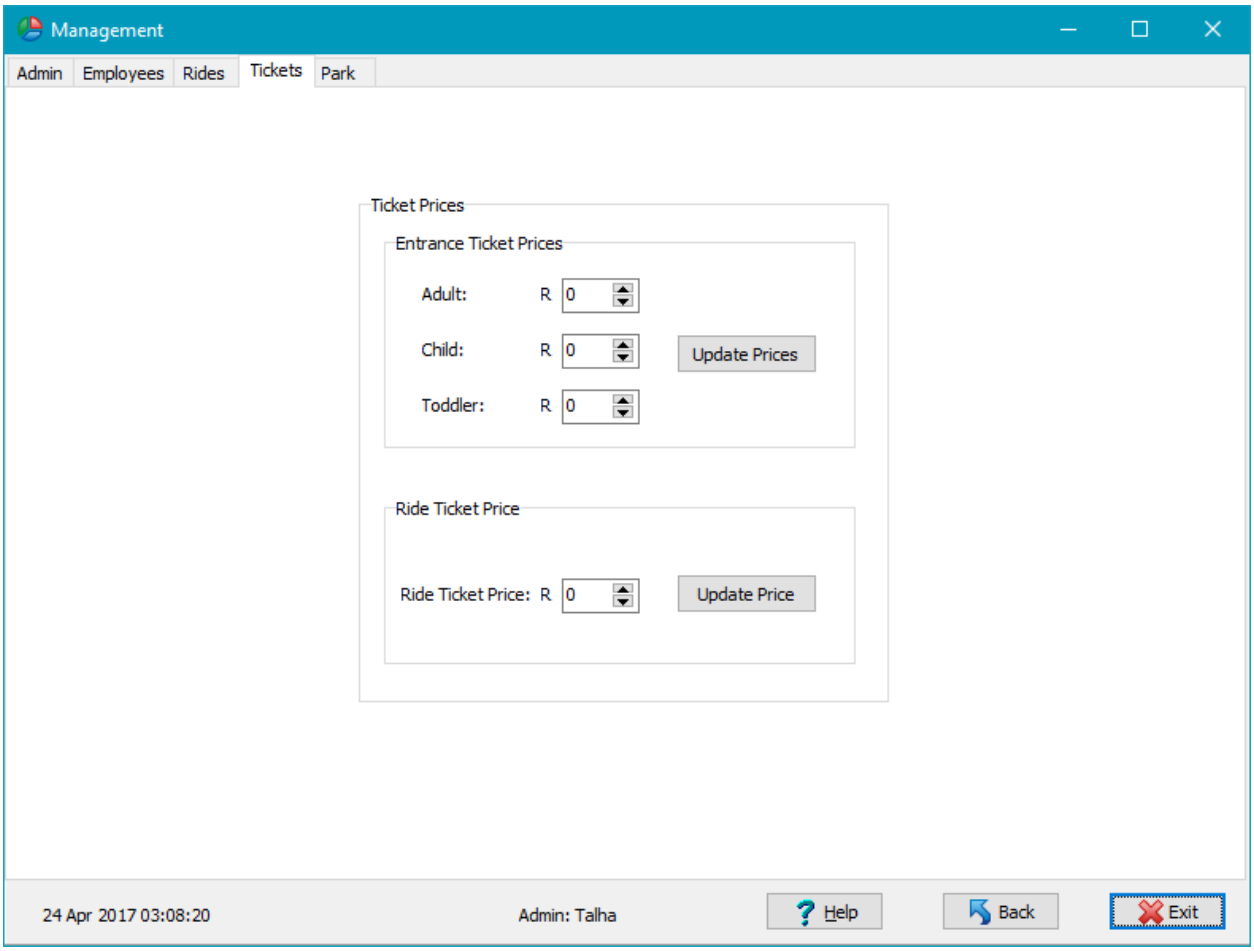
Ride – Management

The user manages the various rides of the amusement park on this screen.



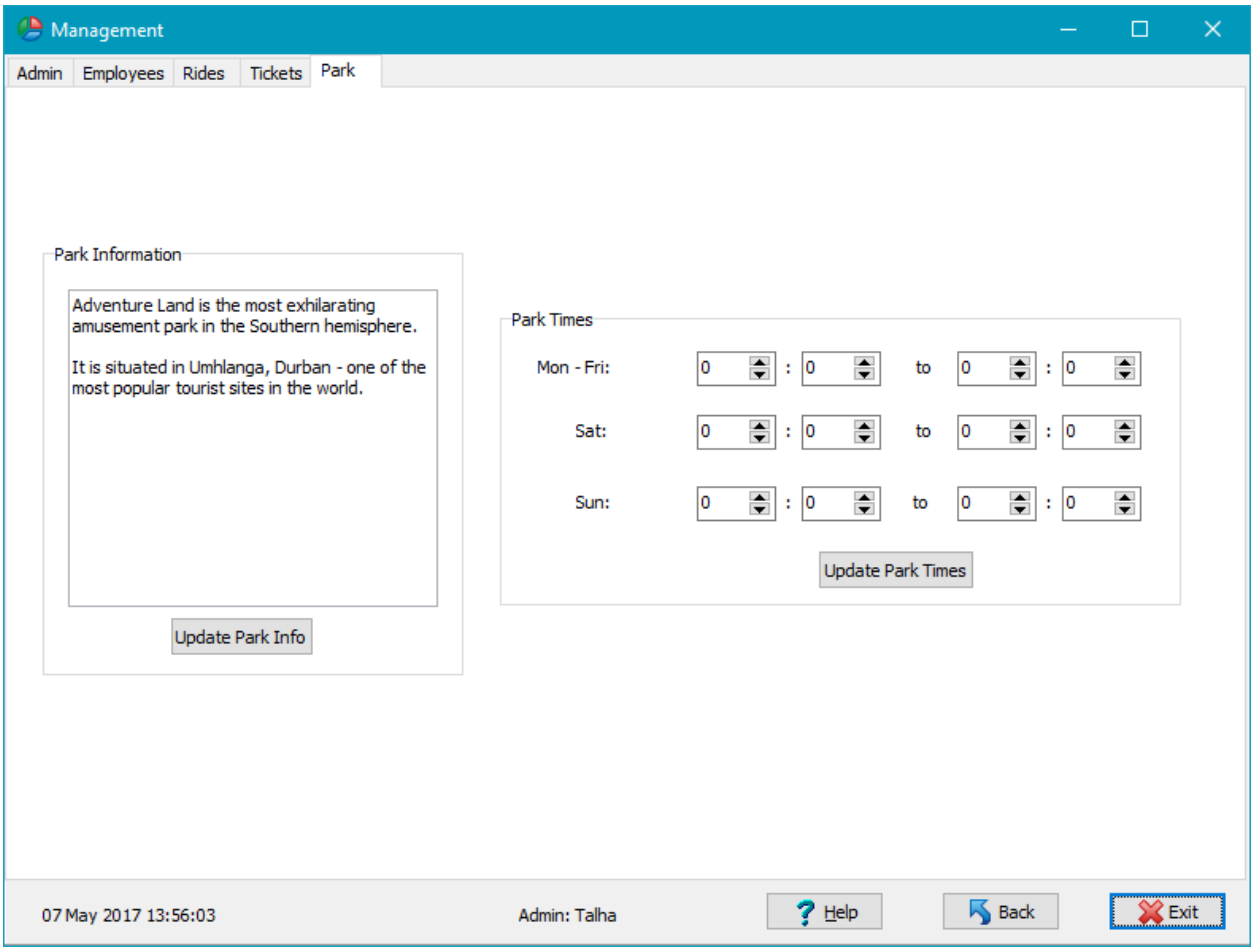
Ticket – Management

This screen allows the admin to change the park's ticket prices. The prices are stored in a text file and read-in when the tabsheet is clicked. The updated prices are re-written to the text file. The SpinEdits' minimum value is 0.



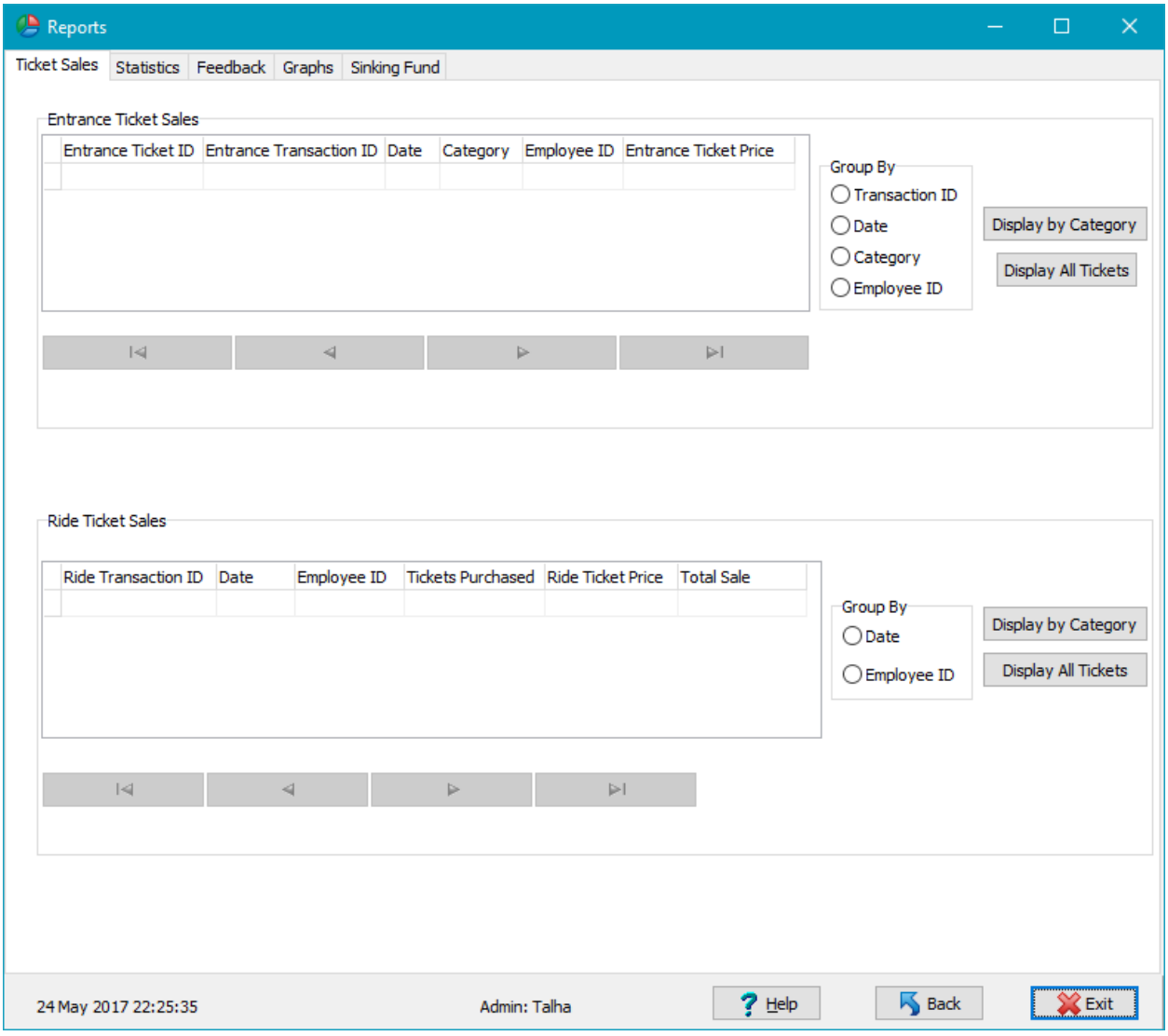
Park – Management

This screen allows the user to manage park information. All the data are stored in text files, read-in when the tabsheet is clicked and re-written when updated. The SpinEdits for the Park Times have min and max values.



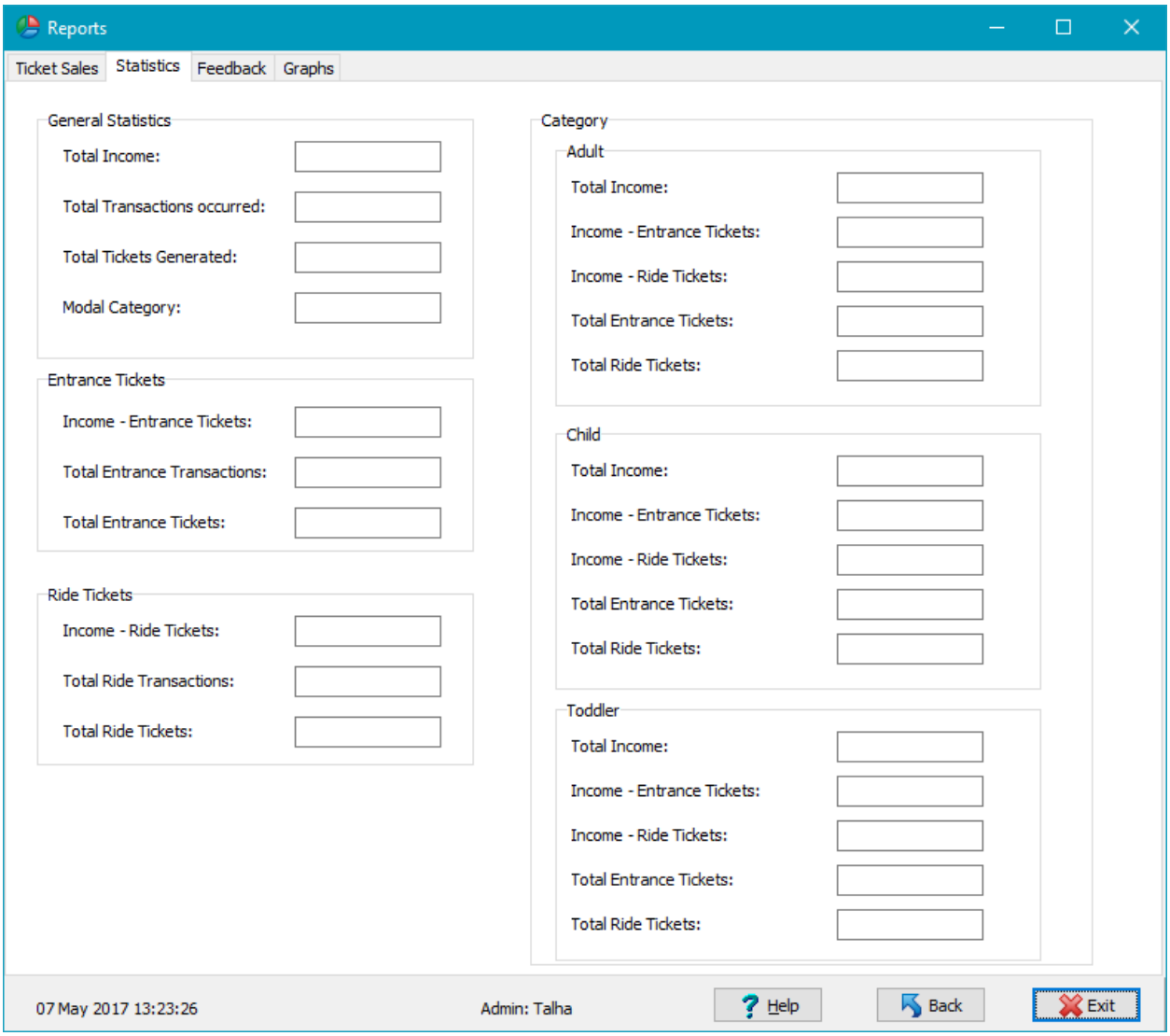
Ticket Sales – Reports

This screen allows the user to view ticket sales. The fields that are displayed on the DBGrid are a combination from the Transaction and Ticket tables and are displayed using SQL Statements. The sales can also be grouped using SQL Statements. By grouping, only the grouped field and the sum of the sales will be displayed.



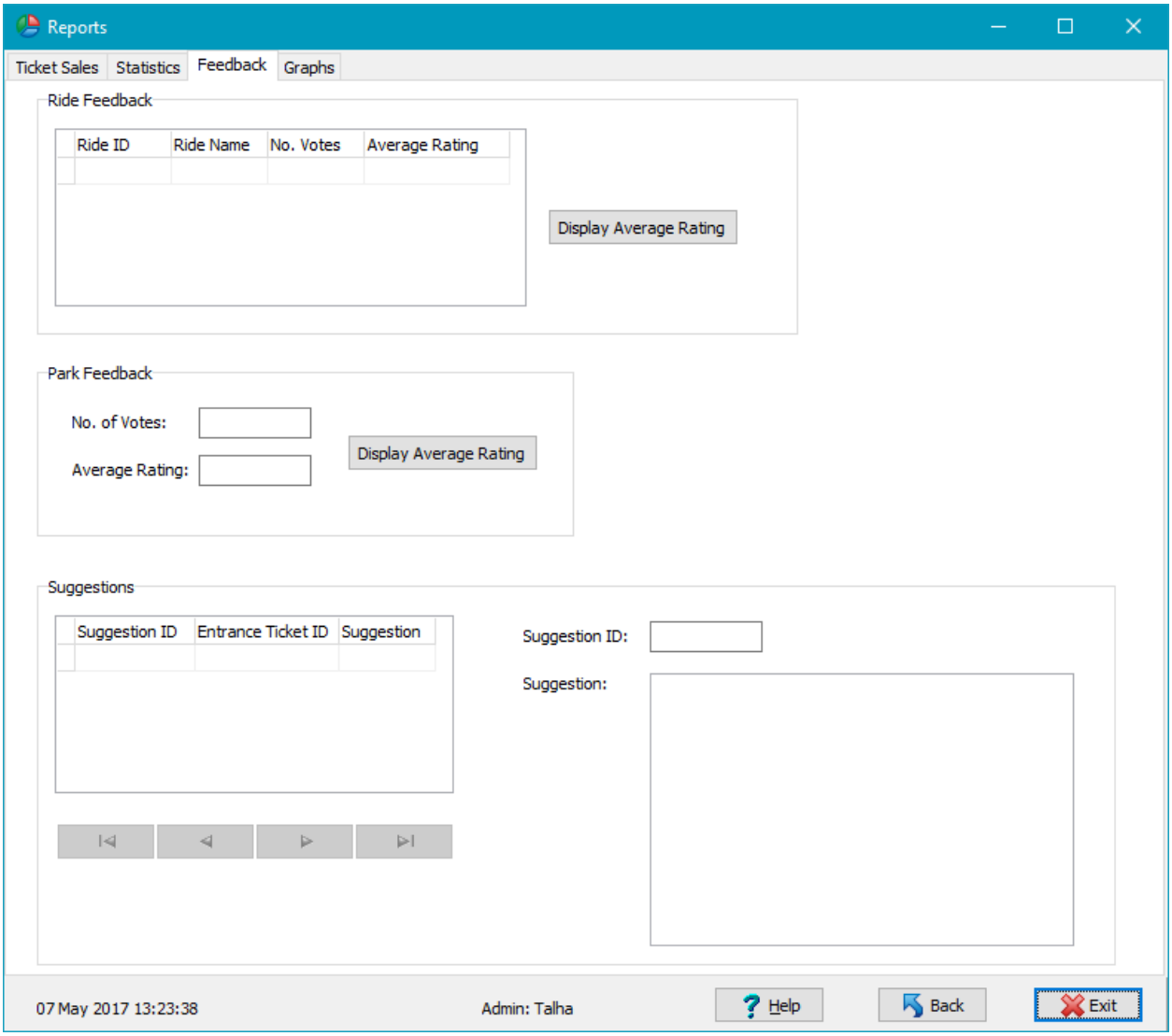
Statistics – Reports

This screen displays statistics. The processing occurs when the form is shown. The Edit components are read-only and currency is formatted.



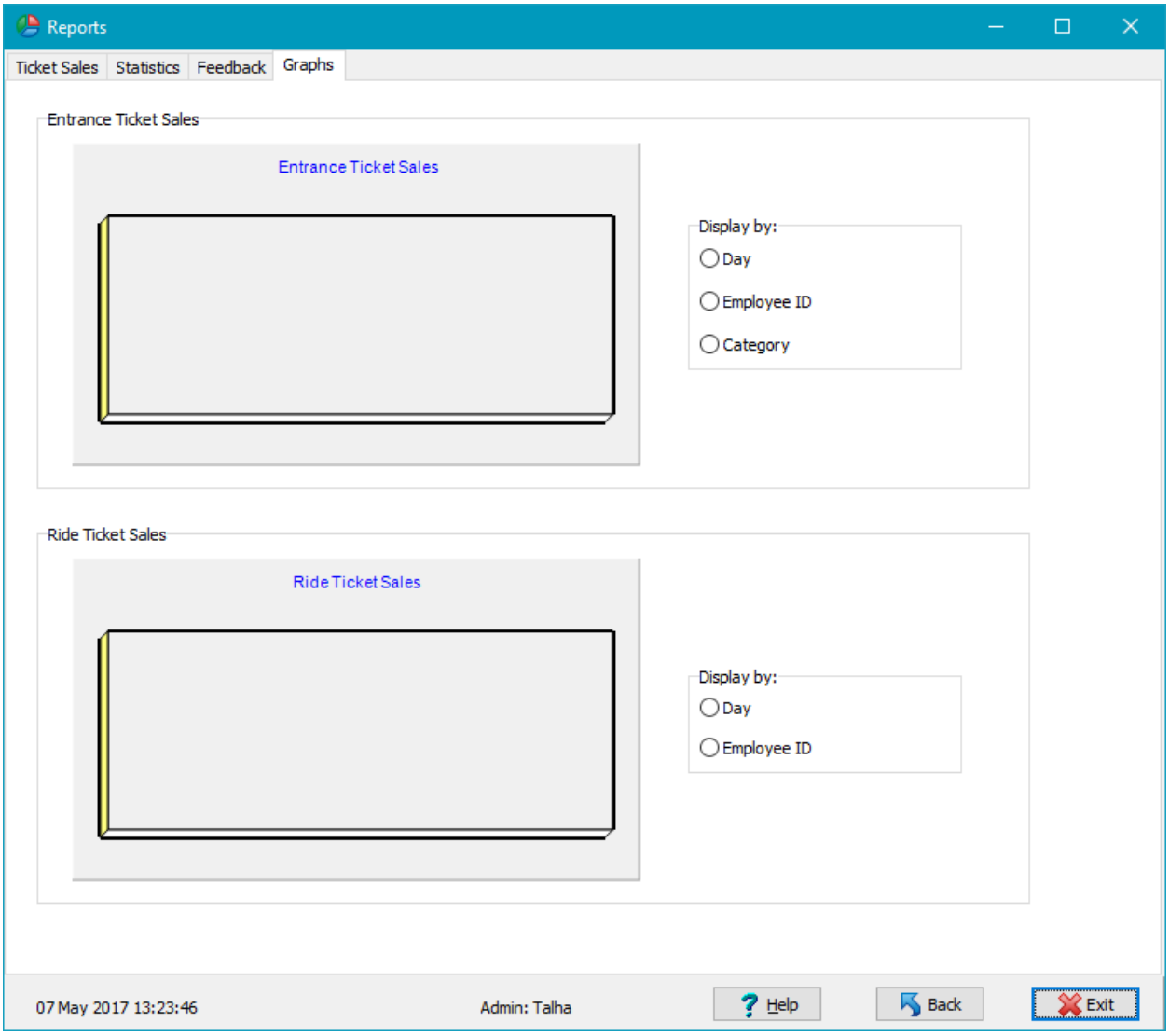
Feedback – Reports

This screen displays all the feedback provided by the visitors. Data will be retrieved from the respective tables in the database. Processing (SQL) occurs when the respective buttons are clicked. The Edit and Memo components in the Suggestions GroupBox display the current selected record in the DBGrid.



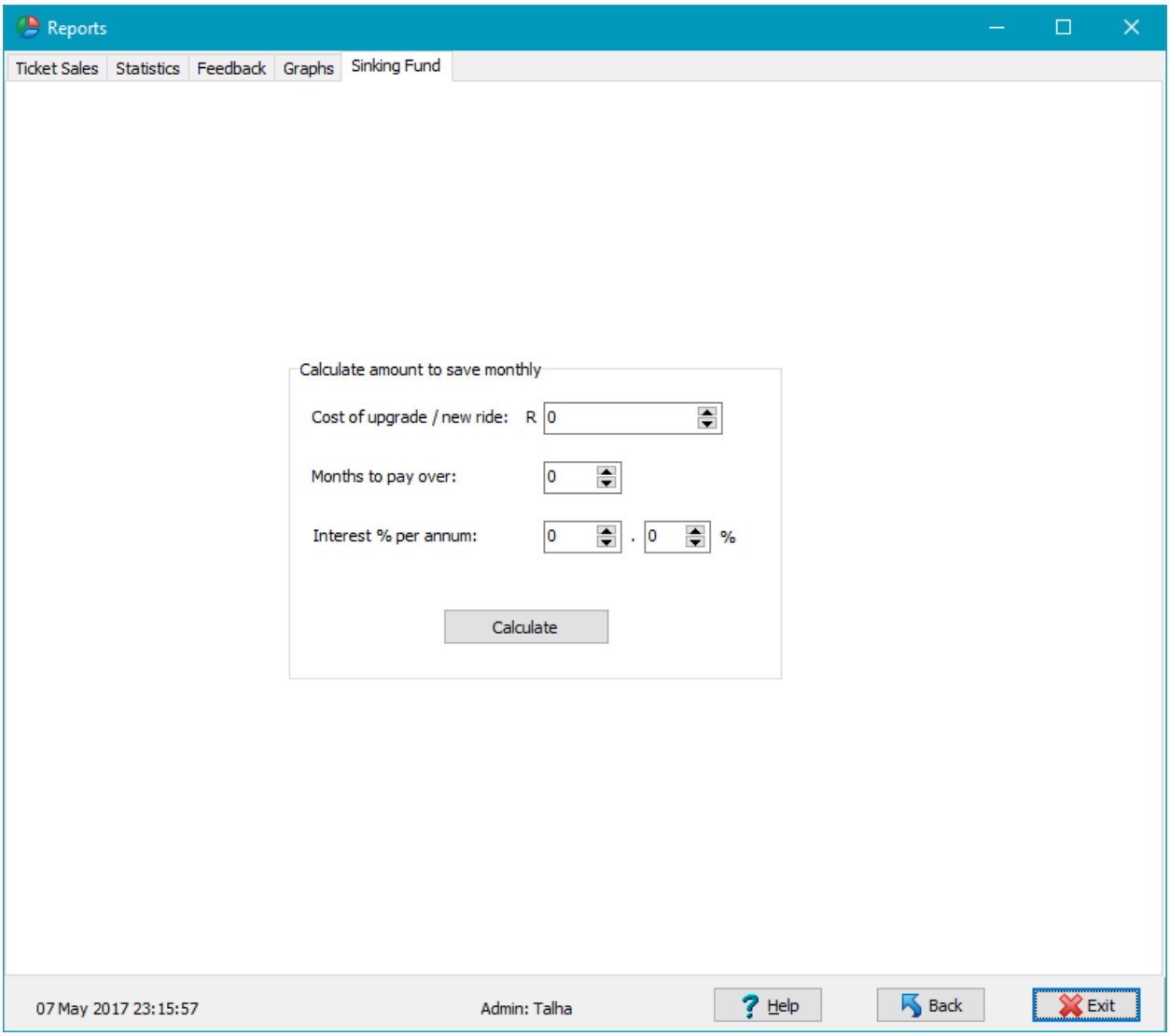
Graphs – Reports

This screen displays graphs for ticket sales when a RadioButton in the RadioGroup is clicked.



Sinking Fund – Reports

This screen allows the user to calculate the amount he has to save monthly I he wants to upgrade rides or purchase new rides.

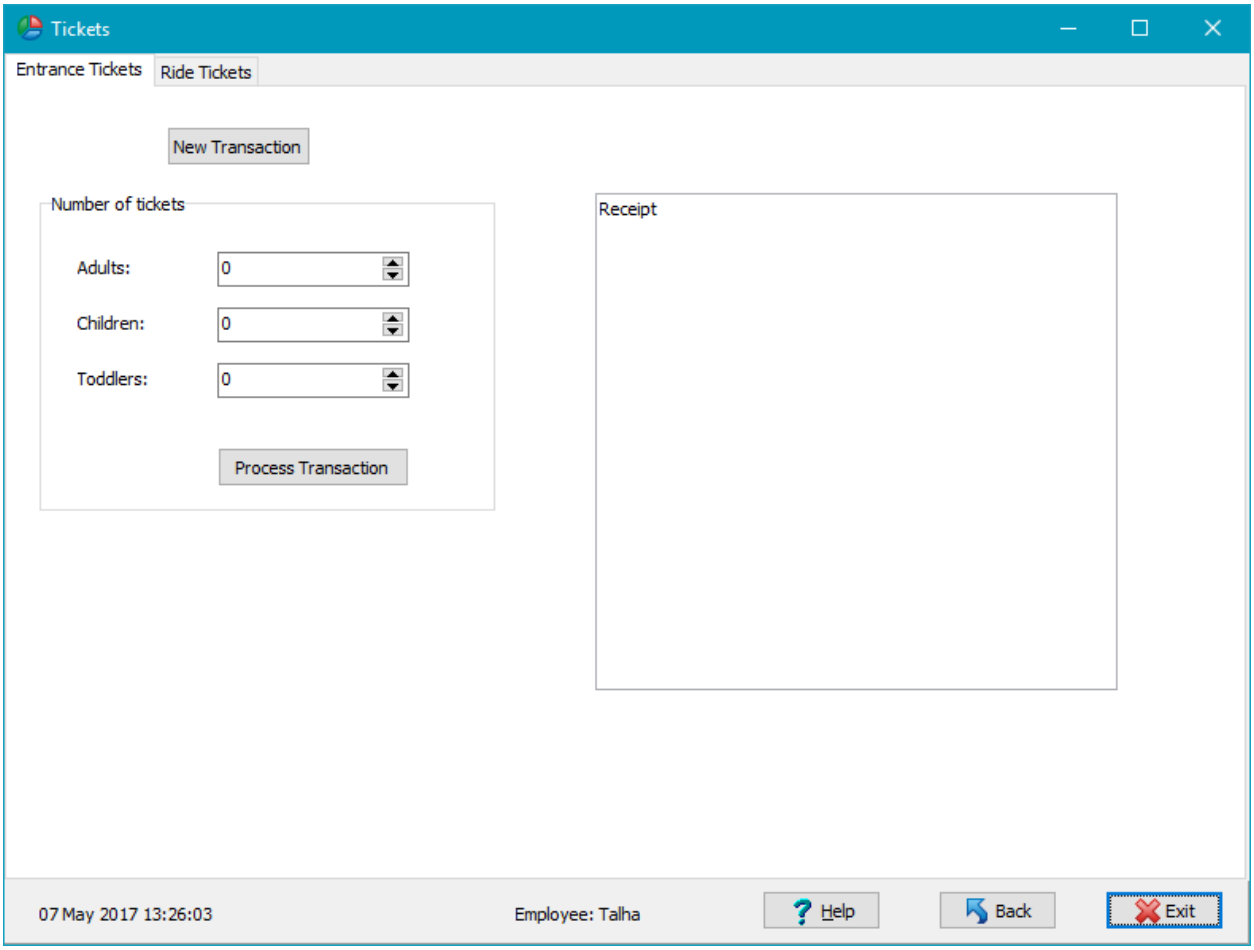


Home – Employee

This is the Employee Home Screen. The employee can generate tickets, view Park Info or Logout by clicking the respected icon. The employee's username is displayed on the menu panel.

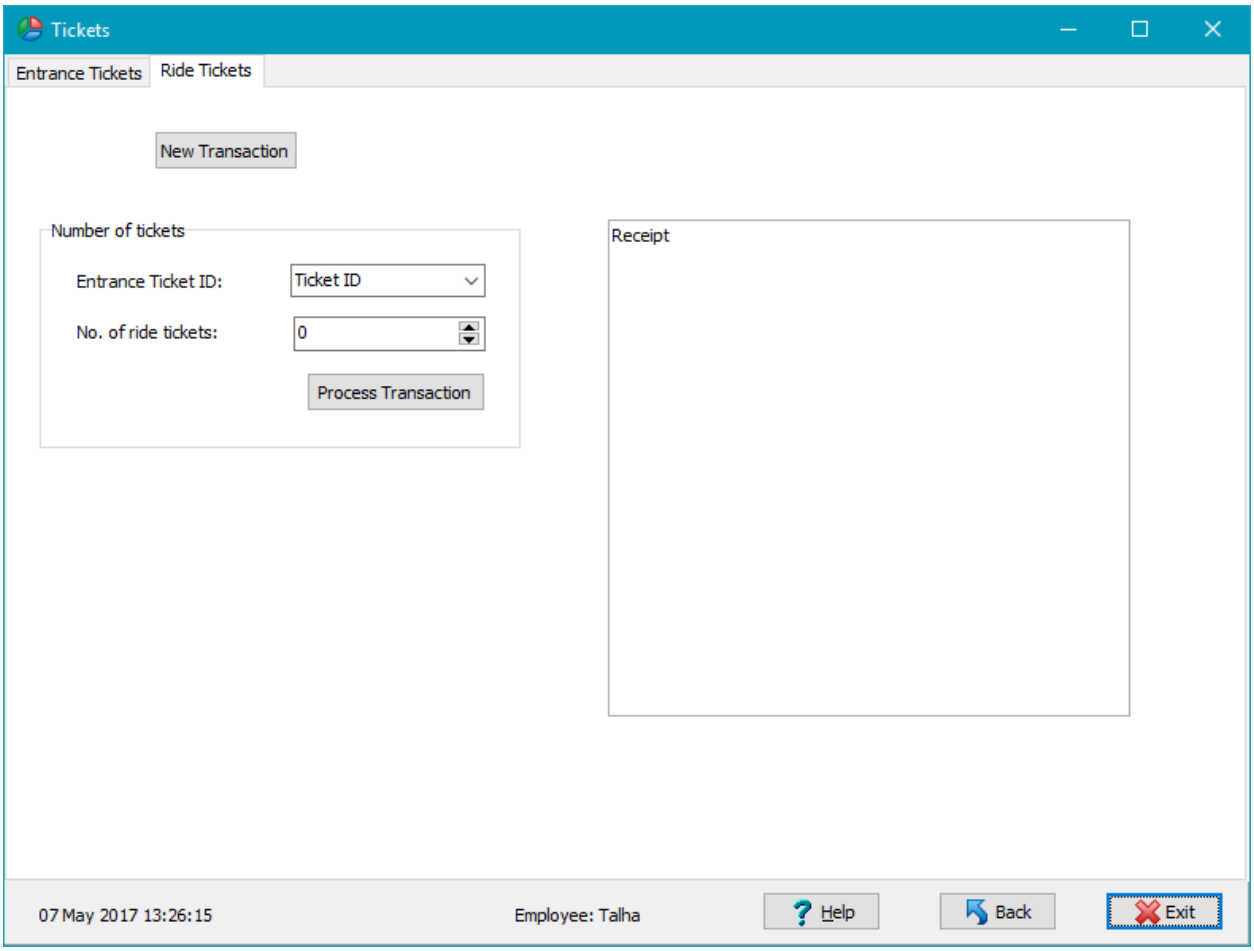
Entrance Tickets – Employee

This screen allows the user to generate entrance tickets. When clicked, the 'New Transaction' button clears values, enables the 'Process Transaction' button and gets disabled. When 'Process Transaction' button is clicked, the transaction is processed, display in the Memo and the tickets are printed. The 'Process Transaction' button gets disabled and the 'New Transaction' button gets enabled.



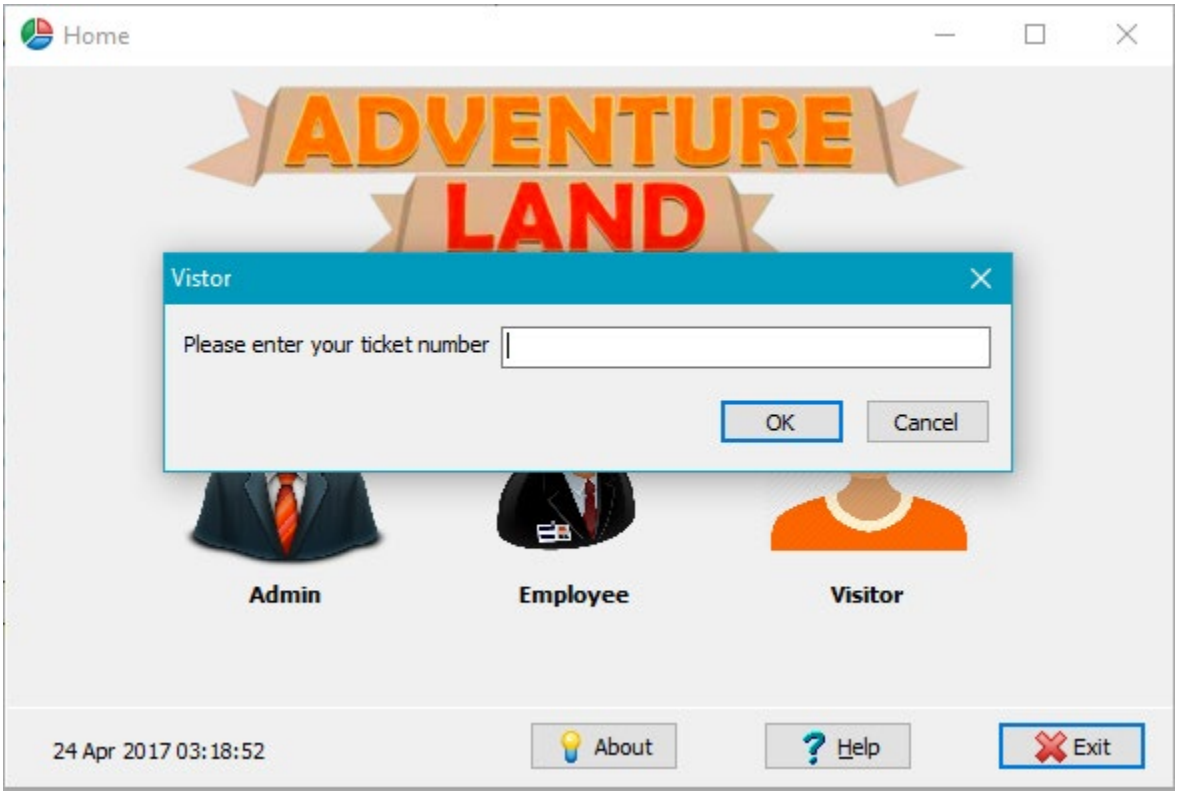
Ride Tickets – Employee

This screen allows the user to generate ride tickets. The ComboBox shows entrance tickets for the current day as entrance tickets are a day pass only.



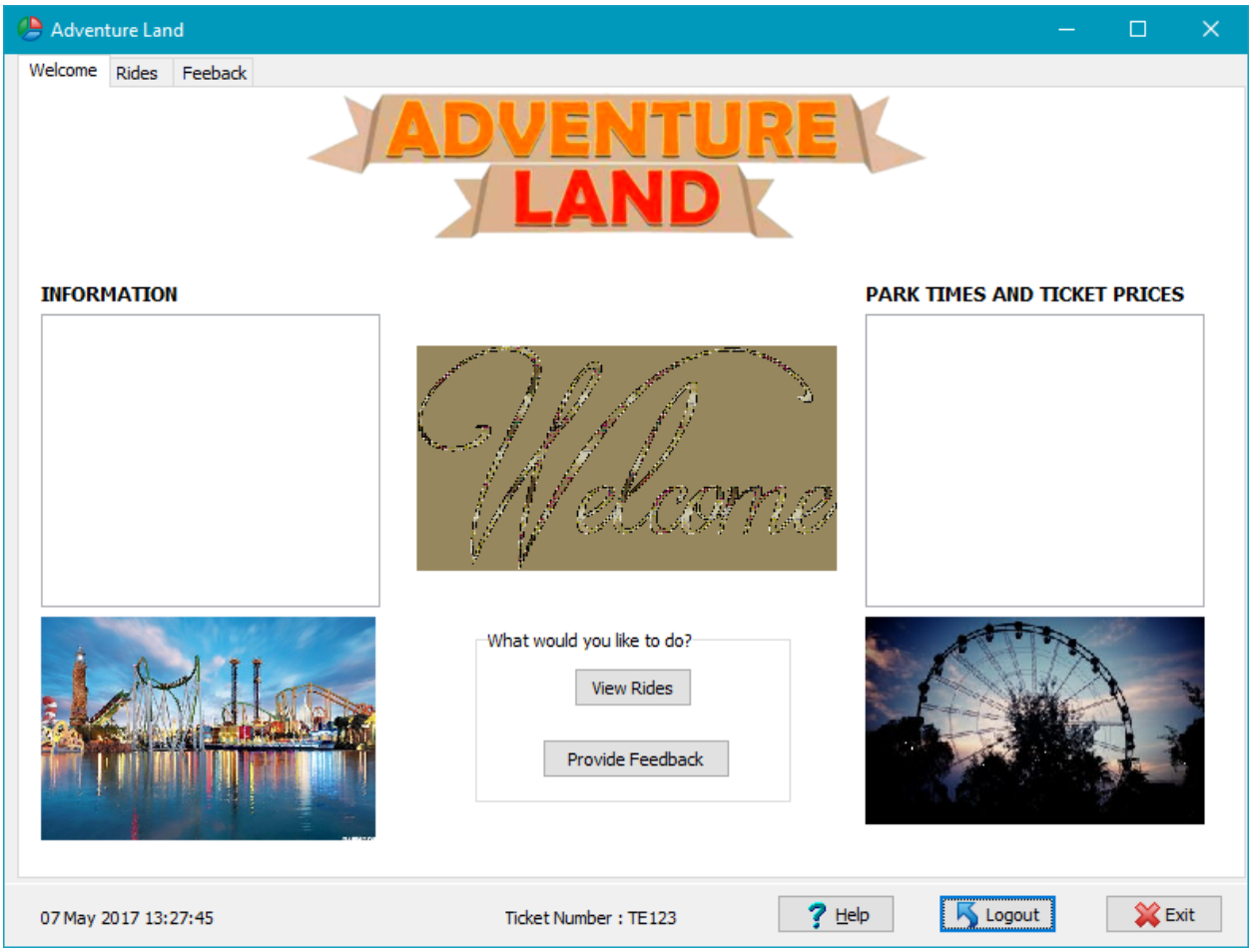
Login – Visitor

The visitor enters his Ticket Number in the InputBox to log in. If the Ticket Number exists, the visitor will be able to proceed otherwise an error message will be displayed and the visitor will have to re-enter his ticket number. Three incorrect entries will result in the user being redirected to the Home Screen.



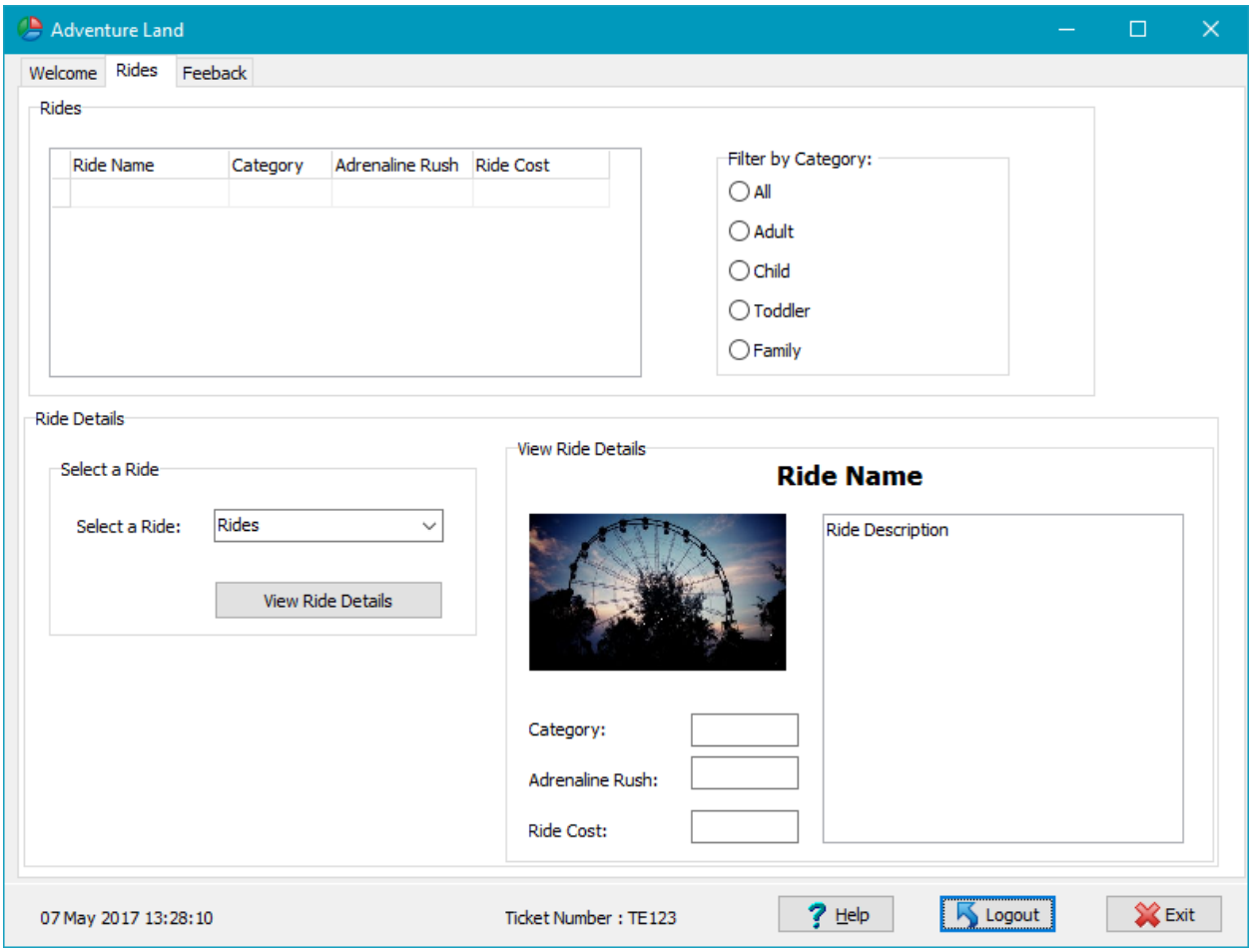
Welcome – Visitor

This screen displays park information and times (which are stored in text files). The Memos are read-only. The buttons in the group box allows the user to proceed to the respective tabsheet.



Rides – Visitor

This screen displays all the rides in the amusement park and they can be filtered by category. The Edits and Memos are read-only.



Feedback – Visitor

This screen allows the visitor to provide feedback. The SpinEdits have min and max values. Once feedback is submitted, it is added to the respective table in the database.