Here is the class project - a campus car parking system. Users (students and faculty) can reserve parking spots on campus .

Arlington Parking, Inc. has a total of 4 parking areas with 4 types of parking as shown in the following table. Only the garage has multiple floors and more than two types of parking.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Description** | | | **Options** | | |
| **Parking Area Name** | **Capacity** | **Floors** | **Type** | **Cart** | **Camera** | **History** |
| West Garage | 250 | 5th | Basic | $15.95 | $2.95 | $1.95 |
| 750 | 2nd-4th | Midrange | $15.95 | $2.95 | $1.95 |
| 230 | 1st | Premium | $15.95 | $2.95 | $1.95 |
| 20 | 1st | Access | $15.95 | $2.95 | $1.95 |
| Maverick | 200 | 1 | Basic | $15.95 | $2.95 | $1.95 |
| 20 | 1 | Access | $15.95 | $2.95 | $1.95 |
| Davis | 150 | 1 | Basic | $15.95 | $2.95 | $1.95 |
| 20 | 1 | Access | $15.95 | $2.95 | $1.95 |
| Nedderman | 180 | 1 | Basic | $15.95 | $2.95 | $1.95 |
| 20 | 1 | Access | $15.95 | $2.95 | $1.95 |

Parking types. Basic parking is available to all users who have a valid UTA parking permit. Midrange requires at least a mid-range parking permit (can be used by Premium permit holders) and Premium is only available to Premium permit holders. Access requires a special access permit.

Parking Options. Each parking option is a one-time charge. Cart allows the user to be picked up from the parking area and dropped off at University Center and vice-versa. Camera options means that a security camera will record and email a video of the entire reservation duration - this is handy for those concerned about car safety. History option provides an email of the recent 12-month history of parking locations and times.

Carts routinely travel the routes to and from parking areas during normal hours. Carts must be special ordered outside of normal hours when a reservation spans across or is fully outside of normal hours - special order carts are twice the basic cart rate. Cart normal hours are as follows.

|  |  |
| --- | --- |
| **Day** | **Hours** |
| M-F | 6am-8pm |
| Sa | 8am-5pm |
| Su | noon-5pm |

Reservation rules - students may make a maximum of three (3-hour) reservations for the current day. No reservations for days other than the current are allowed. Reservations are made starting with the hour and with each 15-minute interval (e.g., 2:00pm, 2:15pm, etc.). Each parking spot has a motion detection camera that takes a picture of the car license plate to ensure proper parking - your system does not need to interface with the camera - the parking system will automatically match the license plate number to the reservation. Students who have 3 no-shows are not allowed to make reservations - a report is provided to the Admin who is the one to revoke reservation abilities - your system does not need to provide a report to the Admin - assume that he already has a report. Students who overstay their reservation are also not allowed to make reservations.

Reservation requests. Each user requests the following:

1. a specific starting time - starting with the hour as noted above
2. a duration (15 minute intervals) - maximum of 3 hours
3. a type of parking (basic, midrange, premium, access). Note that higher level access is also able to reserve a lower access type - Premium may reserve Premium, Midrange, and Basic spaces. Only Access may reserve an access type parking spot.
4. options (see table)

Availability. The system shall show the availability of parking as follows (the following is a selectable list):

1. Type of parking requested
2. Parking area name (list them in ascending alphabetic order)
3. Parking area floor (if West garage)
4. Number of spaces available by parking type. Note that the system shall only show spaces available for those parking spots that the user is allowed to park in based on his permit.
5. Any one time fees incurred

Assignment of space. Once the user has selected a specific parking spot the system assigns the first available numeric parking spot. Assume all parking spots start with number 1 and continue to the maximum for that parking area.

Three different kinds of users for the system:

1. Parking manager
   1. creates own profile
   2. views numbers of spaces available by type and time
   3. views details of a specific parking spot
   4. views details of a specific parking user (including violations and no-shows)
   5. deletes a reservation
   6. modifies a reservation
   7. makes a parking spot unavailable
   8. update his own profile
   9. able to add a new parking area
   10. able to modify a parking area (add or delete spaces)
2. Parking user (student, faculty, and staff)
   1. creates own profile
   2. requests reservation
   3. view my reserved rentals
   4. modify my reserved rentals
   5. cancel my reserved rentals
   6. view my no-shows and violations
   7. update profile
   8. view reservation status (revoked or active)
3. Admin
   1. creates own profile
   2. edit user profile
   3. change user roles
   4. revoke user (user still exists in system but cannot reserve a parking spot) - must provide a reason for revocation.
   5. activate a revoked user

All users will have the standard functions like register, login, logout. Each system user must register and for simplicity selects their role during registration. Assume that a single user that has multiple roles, e.g. User and Parking manager would register twice with different user names - the only affect of this rule is that each user name is unique and may be used as a Primary key in the database. Each user registers with at least a user name, role, UTA id, and personal details, contact information, car information, parking permit information, etc.

The system takes only credit cards: Visa, MasterCard, AMEX and Discover. For simplicity, payments that have valid credit card formats will be accepted. A confirmation is returned once payment is accepted.

Project must use - Eclipse IDE, Java, Java Servlets/JSPs and MySQL. PHP and/or JavaScript is NOT allowed.