

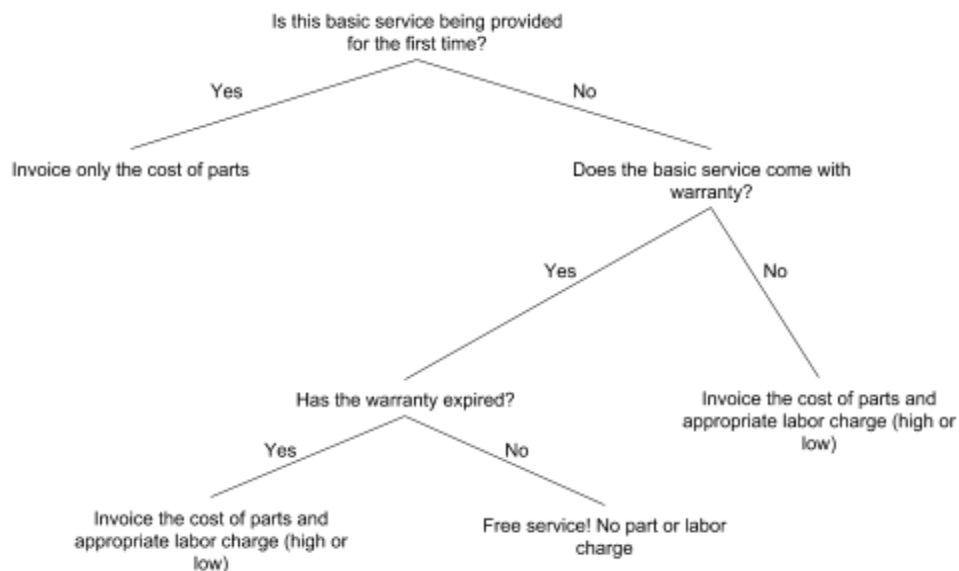
CSC 540 - DATABASE MANAGEMENT CONCEPTS & SYSTEMS

FALL 2018 PROJECT 1 - DATABASE APPLICATION DESIGN & IMPLEMENTATION

CARS - CAR Repair and Service management system
Sample Data

Notes:

1. The sample data provided here should be pre-populated in your schema before the demo.
2. The data organization shown below is only a representation, used to deliver the sample data. It is by no means an accurate or a suggested structure for your schema. As long as you save all the provided information in your application, we should be able to successfully run the demo.
3. We have intentionally not provided data that can be computed/derived from the above data, such as payroll, invoices, etc.
4. Wherever possible, you must ensure that when you populate the sample data in your application, all missing unique IDs are included. Creating unique IDs is trivial, for example, when storing parts information you could generate unique IDs for parts as P0001, P0002, and so on. You may also need to resolve certain names with IDs, for example, in the orders data, you should use part ID instead of parts name when populating your schema.
5. Wherever possible, you must ensure to populate your schema with any missing information, for example, passwords for the users of the system.
6. For simplicity, assume that you cannot make same day appointments. Appointments must be created at least one business day in advance.
7. The labor charge for a basic service (low charge or high charge) is used only for invoicing the customer. This charge should NOT be included in the paycheck for the mechanic. A mechanic is paid solely based on the number of hours he works on a car.
8. The following relationship tree explains how you can compute the appropriate charge for a basic service when generating an invoice:



Service Centers

ID: S0001

Name: Downtown Auto Care

Address: 437 Fayetteville St., Raleigh, NC 27601

Telephone Number: 1.800.899.9999

ID: S0002

Name: Express Auto Shop

Address: 201 N Tryon St, Charlotte, NC 28202

Telephone Number: 1.704.333.1555

Distributors

ID: D0001

Name: D1

ID: D0002

Name: D2

Employees

Employees of Service Center S0001

Manager:

Employee ID: 950932130

Name: Larry Cohen

Address: 1979 Henry Street, Raleigh, NC 27606

Email Address: lacohen@acme.com

Phone Number: 316-978-5494

Start Date: August 15, 2016

Compensation: \$11,000 per month

Receptionist:

Employee ID: 634622236

Name: Willis Martin

Address: 465 Aviation Way, Raleigh, NC 27601

Email Address: wimartin@acme.com

Phone Number: 213-988-2011

Start Date: December 4, 2017

Compensation: \$8,000 per month

Mechanics:

Employee ID: 557279280
Name: Jacob Gloss
Address: 2014 Leverton Cove Road, Raleigh, NC 27560
Email Address: jagloss@acme.com
Phone Number: 413-335-9523
Start Date: July 29, 2018
Compensation: \$30 per hour

Employee ID: 183683346
Name: Anthony Freeman
Address: 1188 Summit Street, Raleigh, NC 27627
Email Address: anfreeman@acme.com
Phone Number: 563-496-7912
Start Date: February 9, 2015
Compensation: \$40 per hour

Employee ID: 557279281
Name: Eric Fowler
Address: 1114 Fincham Road, Raleigh, NC 27545
Email Address: erfowler@acme.com
Phone Number: 760-457-9846
Start Date: May 1, 2016
Compensation: \$35 per hour

Employee ID: 557279282
Name: Roland Richmond
Address: 1951 Little Acres Lane, Raleigh, NC 27513
Email Address: rorichmond@acme.com
Phone Number: 829843373
Start Date: December 28, 2017
Compensation: \$30 per hour

Employee ID: 557279283
Name: Peter Fitzpatrick
Address: 4738 Buckhannan Avenue, Raleigh, NC 27625
Email Address: pefitzpatrick@acme.com
Phone Number: 315-485-1152
Start Date: April 12, 2017
Compensation: \$34 per hour

Employees of Service Center S0002

Manager:

Employee ID: 291056276
Name: Roderick Phillips
Address: 1133 Burton Avenue, Charlotte, NC 28201
Email Address: rophillips@acme.com
Phone Number: 901-777-0492
Start Date: April 15, 2017
Compensation: \$12,000 per month

Receptionist:

Employee ID: 911639633
Name: Dena Holmes
Address: 1382 Whispering Pines Circle, Charlotte, NC 28205
Email Address: deholmes@acme.com
Phone Number: 972-353-3691
Start Date: January 4, 2010
Compensation: \$9,000 per month

Mechanics:

Employee ID: 590424694
Name: Dustin Esparza
Address: 3510 Hemlock Lane, Charlotte, NC 28202
Email Address: duesparza@acme.com
Phone Number: 956-444-0948
Start Date: January 26, 2017
Compensation: \$35 per hour

Employee ID: 401671897
Name: Charles Pudilo
Address: 196 Park Boulevard, Charlotte, NC 28222
Email Address: chpudilo@acme.com
Phone Number: 641-752-9403
Start Date: July 6, 2016
Compensation: \$40 per hour

Employee ID: 310773348
Name: James Rivera
Address: 908 Alpha Avenue, Charlotte, NC 28130
Email Address: jarivera@acme.com
Phone Number: 903-967-1809
Start Date: October 29, 2013
Compensation: \$40 per hour

Employee ID: 983204784
Name: Willis Morton
Address: 404 Tenmile, Charlotte, NC 28134
Email Address: wimorton@acme.com
Phone Number: 757-886-6330
Start Date: October 13, 2018
Compensation: \$30 per hour

Employee ID: 187658163
Name: Rickie Henderson
Address: 1963 Chenoweth Drive, Charlotte, NC 28228
Email Address: rihenderson@acme.com
Phone Number: 931-539-1294
Start Date: March 29, 2017
Compensation: \$30 per hour

Customer & Cars

ID:1001 (Registered with Service Center S0001)
Name: Tom Cruise
Address: 203, Park St, Raleigh, NC - 27603
Email: ethanhunt@gmail.com
Phone: 1234567890

Cars:

1. XYZ-5643, Honda, Civic, 2009, purchased 24-Dec-2009. Latest service info: 90452 miles, Service C on 10-Sep-2018
2. AHS-3132, Toyota, Prius, 2007, purchased 2-Jan-2011. Latest service info: 65452 miles, Repair (Battery does not hold charge) on 6-Aug-2018

ID:1002 (Registered with Service Center S0001)
Name: Robert Downey Jr.
Address: 12-A, High St, Raleigh, NC - 27605
Email: jarvis@gmail.com
Phone: 9989877791

Cars:

1. IRM-1212, Nissan, Altima, 2001, purchased 7-Sept-2002. Latest service info: 210452 miles, Service A on 11-Feb-2018

ID:1003 (Registered with Service Center S0002)

Name:Taylor Swift

Address: 2A, 3rd Ave, Charlotte, NC - 28134

Email: lovestory@gmail.com

Phone: 8179827199

Cars:

1. TSW-3462, Honda, Accord, 2015, purchased 9-Dec-2015. Latest service info: Null.
2. DEL-8888, Nissan, Rogue, 2014, purchased 11-May-2016. Latest service info: 31209 miles, Service A on 11-Feb-2018.

ID:1004 (Registered with Service Center S0002)

Name:Serena Williams

Address: 90, Gorman St, Charlotte, NC - 28201

Email: venus@gmail.com

Phone: 8714791879

Cars:

1. P11-212A, Honda, Accord, 2009, purchased 14-Apr-2010. Latest service info: 60452 miles, Service B on 1-Sep-2017
2. WIM-BLE5, Toyota, Prius, 2013, purchased 1-Mar-2014. Latest service info: 19876 miles, Service A on 11-Nov-2016

Parts and Warranty

Parts	Toyota		Honda		Nissan	
	Price (\$)	Warranty (months)	Price	Warranty (months)	Price	Warranty (months)
Air Filter	11	N/A	59	N/A	61	N/A
Axel Rod	123	2	141	2	241	3
Battery	63	6	79	3	14	3
Brake Fluid	24	N/A	75	N/A	16	N/A
Brake Shoes	62	2	41	3	47	1
Camshaft	1428	3	511	2	1295	2
Catalytic converter	801	1	716	2	589	1
Coolant	63	N/A	10	N/A	39	N/A
Drive belt	528	1	1443	1	1084	3
Engine oil	63	N/A	27	N/A	14	N/A
Gears	523	1	1344	3	1176	3
Light assembly	617	2	1342	2	1367	2
Oil Filter	36	N/A	42	N/A	61	N/A
Piston	1256	1	1145	1	1341	3
Power Steering Fluid	17	N/A	24	N/A	20	N/A
Spark plug	64	2	50	2	11	1
Suspension fluid	70	N/A	77	N/A	32	N/A
Valve	1338	1	1261	2	1013	1
Wiper Fluid	28	N/A	56	N/A	31	N/A

Basic Services

Each basic service in the table below is associated with a pre-defined labor charge identified as either a low charge or a high charge. These charges are as follows:

- a. Low charge = \$50 per hour
- b. High charge = \$65 per hour

Service (charge rate, time required)	Toyota Corolla	Toyota Prius	Honda Civic	Honda Accord	Nissan Altima	Nissan Rogue
Air filter change (low, 0.25 hrs)	Air filter x 1	Air filter x 1	Air filter x 1	Air filter x 2	Air filter x 1	Air filter x 3
Battery replacement (low, 0.25 hrs)	Battery x 1	Battery x 1	Battery x 1	Battery x 1	Battery x 1	Battery x 2
Brake check (low, 0.25 hrs)	Brake fluid x 1	Brake fluid x 1	Brake fluid x 1	Brake fluid x 1	Brake fluid x 1	Brake fluid x 2
Brake repair (low, 0.5 hrs)	Brake shoes x 4	Brake shoes x 4	Brake shoes x 4	Brake shoes x 4	Brake shoes x 4	Brake shoes x 4
Camshaft replacement (high, 1 hrs)	Camshaft x 1	Camshaft x 1	Camshaft x 1	Camshaft x 1	Camshaft x 1	Camshaft x 2
Catalytic convertor replacement (high, 1 hrs)	Catalytic convertor x 1	Catalytic convertor x 1	Catalytic convertor x 1	Catalytic convertor x 1	Catalytic convertor x 1	Catalytic convertor x 1
Coolant recycle (low, 0.25 hrs)	Coolant x 1	Coolant x 1	Coolant x 1	Coolant x 1	Coolant x 2	Coolant x 2
Drive belt replacement (high, 1 hrs)	Drive belt x 1	Drive belt x 1	Drive belt x 1	Drive belt x 1	Drive belt x 1	Drive belt x 1
Engine oil change (low, 0.25 hrs)	Engine oil x 1	Engine oil x 1	Engine oil x 1	Engine oil x 1	Engine oil x 2	Engine oil x 3
Gearbox repair (high, 1 hrs)	Gears x 6	Gears x 6	Gears x 12	Gears x 7	Gears x 7	Gears x 9

Headlights replacement (low, 0.5 hrs)	Light assembly x 2	Light assembly x 2	Light assembly x 2	Light assembly x 2	Light assembly x 2	Light assembly x 2
Oil filter change (low, 0.25 hrs)	Oil filter x 1	Oil filter x 1	Oil filter x 1	Oil filter x 1	Oil filter x 1	Oil filter x 2
Piston replacement (high, 1 hrs)	Piston x 4	Piston x 4	Piston x 4	Piston x 4	Piston x 6	Piston x 8
Power steering check (low, 0.25 hrs)	Power steering fluid x 1	Power steering fluid x 1	Power steering fluid x 1	Power steering fluid x 1	Power steering fluid x 1	Power steering fluid x 1
Spark plugs replacement (low, 0.25 hrs)	Spark plugs x 4	Spark plugs x 4	Spark plugs x 4	Spark plugs x 4	Spark plugs x 6	Spark plugs x 8
Suspension check (low, 0.25 hrs)	Suspension fluid x1	Suspension fluid x1	Suspension fluid x1	Suspension fluid x1	Suspension fluid x1	Suspension fluid x1
Tail lights replacement (low, 0.5 hrs)	Light assembly x 2	Light assembly x 2	Light assembly x 2	Light assembly x 2	Light assembly x 2	Light assembly x 2
Turn lights replacement (low, 0.5 hrs)	Light assembly x 4	Light assembly x 4	Light assembly x 4	Light assembly x 4	Light assembly x 4	Light assembly x 4
Valve replacement (high, 1 hrs)	Valves x 4	Valves x 4	Valves x 4	Valves x 4	Valves x 6	Valves x 8
Wheel alignment (high, 1 hrs)	Axel rod x 2	Axel rod x 2	Axel rod x 2	Axel rod x 2	Axel rod x 2	Axel rod x 2
Wiper check (low, 0.25 hrs)	Wiper fluid x 1	Wiper fluid x 1	Wiper fluid x 1	Wiper fluid x 1	Wiper fluid x 1	Wiper fluid x 1

Car Service Details

Maintenance

Car	Service A	Service B	Service C
Toyota Corolla	(5k miles) Engine oil change, Coolant recycle	(25k miles) Service A + Air filter change, Oil filter change, Brake check, Wiper check, Spark plugs replacement	(45k miles) Service B + Suspension check, Brake repair, Power steering check
Toyota Prius	(10k miles) Engine oil change, Oil filter change, Coolant recycle	(28k miles) Service A + Air filter change, Brake check, Wiper check, Spark plugs replacement, Battery replacement	(58k miles) Service B + Suspension check, Brake repair, Power steering check
Nissan Altima	(10k miles) Engine oil change, Air filter change, Oil filter change, Coolant recycle	(25k miles) Service A + Brake check, Wiper check	(50k miles) Service B + Suspension check, Brake repair, Power steering check, Spark plugs replacement
Nissan Rogue	(10k miles) Engine oil change, Air filter change, Power steering check, Oil filter change, Brake check, Coolant recycle	(37k miles) Service A + Suspension check, Wiper check, Spark plugs replacement	(70k miles) Service B + Brake repair, Battery replacement
Honda Accord	(15k miles) Engine oil change, Air filter change, Oil filter change, Coolant recycle	(37k miles) Service A + Brake check, Wiper check, Spark plugs replacement	(67k miles) Service B + Suspension check, Brake repair, Power steering check

Honda Civic	(14k miles) Engine oil change, Brake check, Coolant recycle	(29k miles) Service A + Air filter change, Oil filter change, Brake repair, Wiper check, Spark plugs replacement	(44k miles) Service B + Suspension check, Power steering check
--------------------	--	---	---

Repairs

1. **Engine knock:**
 - a. **Diagnostic:** Timing issue
 - b. **Diagnostic fee:** \$75
 - c. **Service:** Drive belt replacement, Spark plugs replacement, Camshaft replacement, Valve replacement
2. **Car drifts in a particular direction**
 - a. **Diagnostic:** Wheel alignment issue
 - b. **Diagnostic fee:** \$50
 - c. **Service:** Wheel alignment
3. **Battery does not hold charge**
 - a. **Diagnostic:** Battery needs replacement
 - b. **Diagnostic fee:** \$25
 - c. **Service:** Battery replacement
4. **Black/unclean exhaust**
 - a. **Diagnostic:** Bad catalytic convertor and filters
 - b. **Diagnostic fee:** \$75
 - c. **Service:** Air filter change, Oil filter change, Catalytic convertor replacement
5. **A/C-Heater not working**
 - a. **Diagnostic:** Drive belt damaged, coolant not enough, weak battery
 - b. **Diagnostic fee:** \$50
 - c. **Service:** Drive belt replacement, coolant recycle, Battery replacement
6. **Headlamps/Tail lamps not working**
 - a. **Diagnostic:** Light assembly damaged
 - b. **Diagnostic fee:** \$30
 - c. **Service:** Headlights replacement, Tail lights replacement, Turn lights replacement
7. **Check engine light**
 - a. **Diagnostic:** Gearbox and Torque convertor issue
 - b. **Diagnostic fee:** \$100
 - c. **Service:** Piston replacement, Gear box repair, Camshaft replacement, Valve replacement

Inventory

Honda

Parts	Downtown Auto Care (Delivery window is 1 business day)			Express Auto Shop (Delivery window is 1 business day)			Distributor delivery window in # of business days (M-F)	
	Current quantity	Minimum inventory threshold	Minimum order quantity	Current quantity	Minimum inventory threshold	Minimum order quantity	D1	D2
Air Filter	43	20	5	46	35	6	N/A	3
Axel Rod	8	5	7	7	6	10	5	N/A
Battery	20	20	5	64	52	3	4	N/A
Brake Fluid	14	4	6	15	3	3	N/A	4
Brake Shoes	8	4	3	20	3	5	N/A	5
Camshaft	22	20	5	42	42	6	4	N/A
Catalytic converter	31	10	5	29	24	5	N/A	3
Coolant	23	23	4	21	12	4	N/A	4
Drive belt	35	30	5	30	23	4	N/A	2
Engine oil	15	5	5	26	10	5	2	N/A
Gears	18	3	5	70	7	5	5	N/A
Light assembly	12	10	8	8	6	3	3	N/A
Oil Filter	11	4	4	31	24	5	4	N/A
Piston	55	48	2	81	73	5	2	N/A
Power Steering Fluid	12	7	5	17	6	4	5	N/A
Spark plug	45	42	5	50	32	4	N/A	5
Suspension fluid	13	11	5	15	6	6	N/A	3
Valve	12	7	5	11	3	6	3	N/A
Wiper Fluid	12	5	5	16	13	5	N/A	3

Toyota

Parts	Downtown Auto Care (Delivery window is 1 business day)			Express Auto Shop (Delivery window is 1 business day)			Distributer delivery window in # of business days (M-F)	
	Current quantity	Minimum inventory threshold	Minimum order quantity	Current quantity	Minimum inventory threshold	Minimum order quantity	D1	D2
Air Filter	13	2	5	26	5	6	N/A	3
Axel Rod	18	5	7	27	6	10	5	N/A
Battery	10	2	5	24	2	3	4	N/A
Brake Fluid	4	4	6	25	3	3	N/A	4
Brake Shoes	18	4	3	20	3	5	N/A	5
Camshaft	12	2	5	22	2	6	4	N/A
Catalytic converter	11	1	5	29	4	5	N/A	3
Coolant	13	2	4	21	2	4	N/A	4
Drive belt	15	3	5	20	3	4	N/A	2
Engine oil	5	5	5	26	20	5	2	N/A
Gears	8	3	5	20	7	5	5	N/A
Light assembly	2	1	8	28	6	3	3	N/A
Oil Filter	1	1	4	21	4	5	4	N/A
Piston	15	4	2	21	3	5	2	N/A
Power Steering Fluid	2	1	5	27	6	4	5	N/A
Spark plug	15	4	5	20	2	4	N/A	5
Suspension fluid	3	1	5	25	6	6	N/A	3
Valve	12	7	5	11	3	6	3	N/A
Wiper Fluid	12	5	5	16	13	5	N/A	3

Nissan

Parts	Downtown Auto Care (Delivery window is 1 business day)			Express Auto Shop (Delivery window is 1 business day)			Distributor delivery window in # of business days (M-F)	
	Current quantity	Minimum inventory threshold	Minimum order quantity	Current quantity	Minimum inventory threshold	Minimum order quantity	D1	D2
Air Filter	33	20	5	16	5	6	N/A	3
Axel Rod	38	5	7	17	6	10	5	N/A
Battery	30	20	5	14	5	3	4	N/A
Brake Fluid	34	4	6	15	3	3	N/A	4
Brake Shoes	38	4	3	10	3	5	N/A	5
Camshaft	32	20	5	12	4	6	4	N/A
Catalytic converter	31	10	5	19	4	5	N/A	3
Coolant	33	23	4	11	2	4	N/A	4
Drive belt	35	30	5	10	3	4	N/A	2
Engine oil	35	5	5	16	10	5	2	N/A
Gears	38	3	5	10	7	5	5	N/A
Light assembly	32	10	8	18	6	3	3	N/A
Oil Filter	31	4	4	11	4	5	4	N/A
Piston	35	18	2	11	7	5	2	N/A
Power Steering Fluid	32	7	5	17	6	4	5	N/A
Spark plug	35	12	5	10	2	4	N/A	5
Suspension fluid	33	11	5	15	6	6	N/A	3
Valve	32	7	5	11	3	6	3	N/A
Wiper Fluid	12	5	5	16	13	5	N/A	3

Service History

Customer: 1001 Car: XYZ-5643

Service Type	Date	Start Time	Mechanic Name
Maintenance Service C	10-Sep-2018	10.00 AM	Jacob Gloss
Maintenance Service B	25-Feb-2018	9.00 AM	Eric Fowler
Maintenance Service A	15-Oct-2017	8.00 AM	Anthony Freeman

Customer: 1001 Car: AHS-3132

Service Type	Date	Start Time	Mechanic Name
Repair (Diagnostic: Battery Does not Hold Charge)	6-Aug-2018	8.00 AM	Roland Richmond
Maintenance Service B	15-May-2018	10.30 AM	Peter Fitzpatrick
Maintenance Service A	28-Jan-2018	12.00 PM	Peter Fitzpatrick

Customer: 1002 Car: IRM-1212

Service Type	Date	Start Time	Mechanic Name
Maintenance Service A	11-Feb-2018	8.30 AM	Eric Fowler
Maintenance Service C	10-Dec-2017	9.30 AM	Eric Fowler
Maintenance Service B	20-Jan-2017	10.00 AM	Eric Fowler

Customer: 1003 Car: DEL-8888

Service Type	Date	Start Time	Mechanic Name
Maintenance Service A	11-Feb-2018	8.30 AM	Rickie Henderson
Repair (Diagnostic: Headlamps/Tail lamps not working)	5-Nov-2016	9.00 AM	Charles Pudilo

Customer: 1004 Car: P11-212A

Service Type	Date	Start Time	Mechanic Name
Maintenance Service B	1-Sep-2017	9.00 AM	Dustin Esparza
Maintenance Service A	15-Jun-2014	8.30 AM	James Rivera

Customer: 1004 Car: WIM-BLE5

Service Type	Date	Start Time	Mechanic Name
Maintenance Service A	11-Nov-2016	8.30 AM	James Rivera
Repair (Diagnostic: A/C-Heater not working)	2-Jan-2016	2.00 PM	Charles Pudilo
Repair (Diagnostic: Engine knock)	30-Sep-2015	11.00 AM	Charles Pudilo

Orders

Order Plcement Date	Expected Delivery Date	Actual Delivery Date	Part	Qty	Origin	Desti-nation	Status
9-Jun-2014	13-Jun-2014	18-Jun-2014	Toyota Battery	5	D0001	S0001	Complete
16-Sep-2015	21-Sep-2015	21-Sep-2015	Honda Wiper fluid	5	D0002	S0001	Complete
10-Feb-2016	11-Feb-2016	11-Feb-2016	Honda Gears	5	S0001	S0002	Complete
9-Aug-2017	10-Aug-2017	11-Aug-2017	Nissan Coolant	4	S0002	S0001	Complete
4-Oct-2018	5-Oct-2018	5-Oct-2018	Toyota Air Filter	6	S0001	S0002	Complete
26-Oct-2018	1-Nov-2018	5-Nov-2018	Nissan Camshaft	5	D0001	S0001	Complete
9-Nov-2018	14-Nov-2018	N/A	Honda Wiper Fluid	7	D0002	S0002	Pending
7-Nov-2018	14-Nov-2018	N/A	Honda Axle Rod	12	D0001	S0002	Pending
8-Nov-2018	14-Nov-2018	N/A	Honda Camshaft	6	D0001	S0002	Pending

8-Nov-2018	14-Nov-2018	N/A	Honda Oil Filter	5	D0001	S0002	Pending
8-Nov-2018	14-Nov-2018	N/A	Honda Brake Fluid	5	D0002	S0002	Pending

Notifications

Date	Center	Message
5-Nov-2018	S0001	5 Camshaft from D0001 delayed by 2 business days
11-Aug-2017	S0002	4 Coolant from D0002 delayed by 1 business day
18-Jun-2014	S0001	5 Battery from D0001 delayed by 3 business days