BAIM 4205-001

Final Project

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Project Scenario

Key Rock is a small but growing beer vending company. Key Rock is an e-commerce B2C company, selling to consumers in the United States of America.

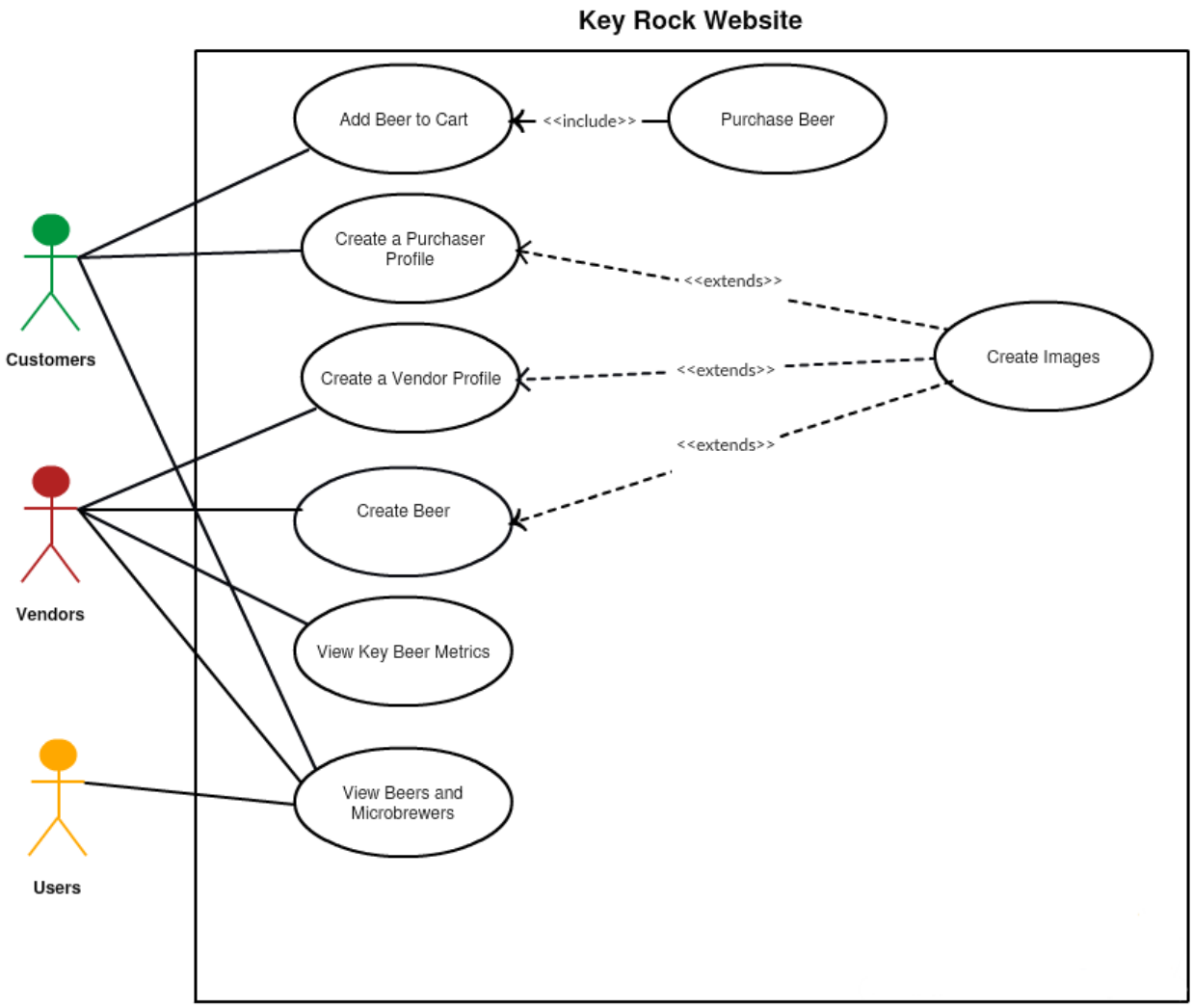
Due to Key Rock's small size, the microbrewers work with Key Rock on a consignment basis, instead of drop-ship. This means that Key Rock pre-purchases the stock from the microbrewers and the microbrewers hold the stock and fulfill the orders. Key Rock is currently working with 5 microbrewers, who brew between 1-3 beers each. The microbrewers may change their stock as often as they like, and sometimes offer seasonal beers as well. The microbrewers can upload images of their stock and are required by Key Rock to offer stock in sizes of 6 bottle pack, 12 can pack, 32 and 64 ounce growlers.

Purchasers create profiles on the site, and provide information that includes their age, first and last name, an image, shipping address, billing address, zip, state, country, and phone number. Users are welcome to visit the site and browse the options but must create a profile before any purchases can be transacted.

Vendors also have a profile on the site, where they can add and monitor their products, update their point-of-contact, phone number, mailing address, an image, and more. They can also view metrics on how their beers are performing and how they are performing relative to other microbrewers. Key Rock's site will also provide metrics on how well different types of beers are selling overall.

Purchasers may browse beers on the website and may add beers to their cart. Once they are ready to purchase, they click through their cart, and have their transaction fulfilled by Stripe, a third-party credit card processor. Each microbrewery invoices Key Rock through an outside site.

Use Case Diagram



Use Cases

Use case name: Add Beer to Cart / Purchase Beer	**ID** 1	**Importance level** High
Primary actor: Customer		
Short description: This describes the process in how a user adds beer to the cart for checkout and subsequently purchases the beer.		
Trigger: Customer wants to place an order for beer **Type:** External / Temporal (highlight one)		

Major Inputs:		**Major Outputs:**	
Description	**Source**	**Description**	**Destination**
Beer	Customer	Purchase Order	Inventory_Purchase_Order Data Store
Quantity	Customer		
Purchaser Profile	Customer Data Store		

Major Steps Performed:	**Information for Steps**
1. Customer adds beer to cart	Beer
2. Customer determines quantity of beer desired	Quantity
3. Customer proceeds to check out	Purchaser Profile
a. Customer uses his/her purchaser profile	
4. Customer checks out	Purchase Order

Use case name: Create a Purchaser Profile	**ID** 2	**Importance level** High
Primary actor: Customer		
Short description: This use case describes how a customer creates a purchaser profile which is then used for information when ordering.		
Trigger: New customer decides to buy beer from Key Rock. **Type:** External / Temporal (highlight one)		

Major Inputs:		**Major Outputs:**	
Description	**Source**	**Description**	**Destination**
Purchaser Info (Age, Address, Phone #, Email)	Customer	Profile Info	User Data Store Customer Data Store
		Created at	User Data Store Customer Data Store
		Error message	Purchaser

Major Steps Performed:	**Information for Steps**
1. Enter personal information	Purchaser Info (Age, Address, Phone #, Email)
2. Check email to ensure customer isn't already in DB. a. If user is in DB, redirect to home page and load already saved user information. b. If user is not DB, allow user to continue creating a purchaser profile.	Error message
3. Save creation time of user and profile information	Profile Info Created at

Use case name: Create a Vendor Profile	**ID** 3	**Importance level** High
Primary actor: Vendor		
Short description: This use case describes how a vendor creates a vendor profile which is then used for sales information.		
Trigger: New vendor decides to sell beer through Key Rock. **Type:** External / Temporal (highlight one)		

Major Inputs:		**Major Outputs:**	
Description	**Source**	**Description**	**Destination**
Vendor Info (Age, Address, Phone #, Email)	Customer	Profile Info	Vendor Data Store
		Vendor ID	Beer Data Store
Beer sold	Vendor	Created at	Vendor Data Store
		Error message	Vendor

Major Steps Performed:	**Information for Steps**
1. Enter vendor information	Vendor Info (Age, Address, Phone #, Email)
2. Enter which beers vendor will sell through Key Rock.	Beer sold
3. Check to see that vendor is not already in system.	
a. If vendor is already in system, display error message.	Error message
b. If vendor is not in system, proceed with creating profile.	Profile Info
	Vendor ID
	Created at

Use case name: Create Beer	**ID** 4	**Importance level** High
Primary actor: Vendors		
Short description: This use case describes how a vendor creates a beer.		
Trigger: Vendor wants to release a new beer for customers to purchase. **Type:** External / Temporal		

Major Inputs:		**Major Outputs:**	
Description	**Source**	**Description**	**Destination**
Beer Name	Vendors	Beer Info	Beer Data Store
Beer Type		Pictures	Image Data Store
Beer Country			
Beer Price			
Beer Size			
Beer Active Status			
Picture			

Major Steps Performed:	**Information for Steps**
1. Enter beer info →	Beer name, type, country, price, size, active status, (optional) image
2. Save beer	
3. Beer becomes 'live' for users to view →	Beer Info

Use case name: View Key Beer Metrics	**ID** 5	**Importance level** High
Primary actor: Customer		
Short description: This describes how a vendor would gather information about their beer sales in order to make more informed business decisions. This process will be solicited through a website, which has not been created.		
Trigger: Vendor wants to look deeper into their beer analytics. **Type:** External / Temporal (highlight one)		

Major Inputs:		**Major Outputs:**	
Description	**Source**	**Description**	**Destination**
Information request	Vendor	Purchase Order Details (aggregated)	Reviewer
Purchase order details	Inventory_Purchase_Order_ Details		

Major Steps Performed:	**Information for Steps**
1. Customer requests aggregate information about beer sales.	Information request
2. Information request uses purchase order details and aggregates into	Purchase order details
3. Data is aggregated using a program (to be developed) that offers insights to its vendors. **a.** If vendor sells more than one type of beer, aggregated order details are separated by beer for comparison.	Purchase Order Details (aggregated)

Use case name: View Beers and Microbrewers	**ID** 6	**Importance level** High
Primary actor: Customers/Vendors/Users		
Short description: This use case describes how a customer, vendor, or user views beer and microbrewers.		
Trigger: Customer/vendor/user wants to view beers and microbrewers **Type:** External / Temporal		

Major Inputs:		**Major Outputs:**	
Description	**Source**	**Description**	**Destination**
Beer/Microbrewer Name	Customer, Vendors, Users	Beer/Microbrewer Info	Reviewer
		Error Message	Reviewer

Major Steps Performed:

1. Enter beer/microbrewer name
2. Check if beer/microbrewer exists
3. a) if exists, display beer/microbrewer info
   b) if doesn't exist, show error message

Information for Steps

Beer/microbrewer name

Beer/Microbrewer Info

Error Message

ER Diagram

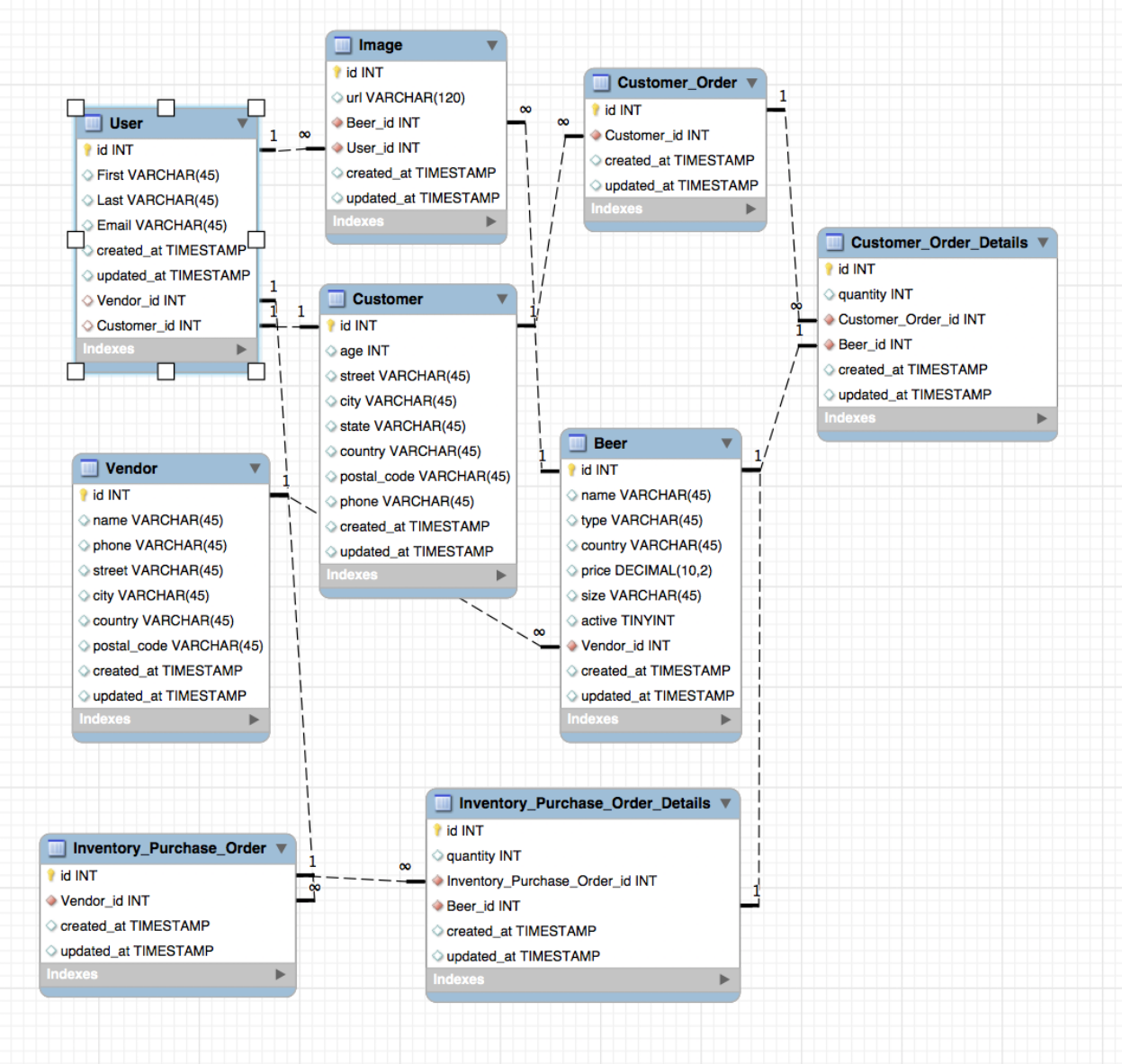


Image
id INT
url VARCHAR(120)
Beer_id INT
User_id INT
created_at TIMESTAMP
updated_at TIMESTAMP
Indexes
Customer_Order
id INT
Customer_id INT
created_at TIMESTAMP
updated_at TIMESTAMP
Indexes
User
id INT
First VARCHAR(45)
Last VARCHAR(45)
Email VARCHAR(45)
created_at TIMESTAMP
updated_at TIMESTAMP
Vendor_id INT
Customer_id INT
Indexes
Customer_Order_Details
id INT
quantity INT
Customer_Order_id INT
Beer_id INT
created_at TIMESTAMP
updated_at TIMESTAMP
Indexes
Customer
id INT
age INT
street VARCHAR(45)
city VARCHAR(45)
state VARCHAR(45)
country VARCHAR(45)
postal_code VARCHAR(45)
phone VARCHAR(45)
created_at TIMESTAMP
updated_at TIMESTAMP
Indexes
Beer
id INT
name VARCHAR(45)
type VARCHAR(45)
country VARCHAR(45)
price DECIMAL(10,2)
size VARCHAR(45)
active TINYINT
Vendor_id INT
created_at TIMESTAMP
updated_at TIMESTAMP
Indexes
Vendor
id INT
name VARCHAR(45)
phone VARCHAR(45)
street VARCHAR(45)
city VARCHAR(45)
country VARCHAR(45)
postal_code VARCHAR(45)
created_at TIMESTAMP
updated_at TIMESTAMP
Indexes
Inventory_Purchase_Order_Details
id INT
quantity INT
Inventory_Purchase_Order_id INT
Beer_id INT
created_at TIMESTAMP
updated_at TIMESTAMP
Indexes
Inventory_Purchase_Order
id INT
Vendor_id INT
created_at TIMESTAMP
updated_at TIMESTAMP
Indexes

Interesting Business Questions

Our business questions fall into three general categories: marketing, product management, and sales. The data we collect regarding marketing questions will allow Key Rock to create marketing campaigns and target their customers in the most effective manner to increase engagement and retention. By addressing data surrounding Key Rock's products, Key Rock can optimize their product offerings to generate higher sales and fuel growth. Sales data will allow Key Rock to advance relationships with their top partners as well as identify new partners to further develop the company. The questions within each category were created with a specific, actionable idea in consideration for Key Rock to make data-driven decisions.

Marketing Questions

1. Which 5 customers have purchased the most beer (by amount)?
    a. As top-buyers, and therefore, top revenue-generators- the 5 customers who purchase the most beer are valuable. According to the 80-20 rule, the top 80% of sales generally come from simply 20% of customers. Key Rock has an opportunity to create retention and engagement-based marketing campaigns directed to these customers, to encourage these customer's continued commitment to purchase from Key Rock.
2. Which 5 customers have the oldest account creation date?
    a. Customers appreciate recognition. By discovering who their original customers are, Key Rock can then send a coupon, discount, or small gift like a growler of their top-purchased beer to thank them for their continued loyalty.
3. Which state has the most customers?
    a. By identifying which state most of their customers reside in, Key Rock may have an opportunity to host a special event for those customers. Many companies have seen success in offering lunch and learns or specialized classes to their customers to increase loyalty and engagement. Key Rock can offer a microbrew class, or a beer and food tasting session to connect with their customers, connect their customers with each other, and build their brand.

Product Management Questions

1. Which beer type has the most sales (by revenue)?
    a. If Key Rock can determine which beer type generates the highest revenue, they have an opportunity to ensure customers can consistently access that type of beer. Since microbrewers have the opportunity to alter their product offerings at-will, Key Rock currently cannot control what customers receive regularly. By identifying the most-demanded type of beer, Key Rock can then create programs to incentivize that Microbrewers offer at least one beer of that type, which will satisfy customers while driving revenue.)

2. Which beer has sold the most in the shortest amount of time (by amount, created_at date)
    a. Key Rock has an opportunity to identify a 'hit' beer- one that is released and immediately begins generating revenue and high sales. By identifying this product, Key Rock will have the opportunity to begin more research into what made it a 'hit', and how to replicate this with other products. There are many reasons why a product may have taken off, from which microbrewer produced it to seasonality, but the first step in replicating an effect like this is determining the basic facts.
3. Which beer size has the most sales (by amount)?
    a. By identifying what size their consumers prefer to purchase, Key Rock can encourage their microbrewers to offer all of their offerings in that size. Recognizing how their customers prefer to consume their beer (i.e they purchase larger sizes for regular get-togethers) will provide Key Rock with an opportunity to ensure consistency across their product offerings in that area.

Sales Questions

1. Which microbrewer has the highest sales (revenue)?
    a. The microbrewer that has created the highest revenue for Key Rock is an important relationship for Key Rock to maintain. By identifying this microbrewer, Key Rock has an opportunity to present the microbrewer with additional contracts, or incentives to remain one of Key Rocks vendors. Beyond contracts and incentives, Key Rock should ensure they are regularly communicating with and strengthening their relationship with this partner.
2. Which country has the highest beer sales (by amount, not revenue)?
    a. By identifying which country sells the most beer, Key Rock has an opportunity to focus on growing their product offerings from that country through new partnerships. By adding products from a category that customers have proven they value, Key Rock has the opportunity to please current customers and sell to new customers. This data will also allow Key Rock to focus on identifying microbrewers in a specific country, which will ultimately save them time as they take a less generalized approach.
3. Which microbrewer has the longest-offered, active beer (based on created_at date)?
    a. As a small company with limited stock, it is important for Key Rock's business model that the product offerings are rotated regularly. While the microbrewers have the 'power' to rotate their offerings as they please, if one beer has been offered for too long it may be time for Key Rock to step in and encourage the microbrewer to mix-up their offerings. Part of the value Key Rock offers to their consumers is to have a changing selection of brews to choose from, so they can regularly be trying something new.

Interesting Business Question Queries

Marketing

1. Which 5 customers have purchased the most beer?

```
30  # Which 5 customers have purchase the most beer (by amount not sales)
31  select u.first, u.last, sum(cod.quantity) as "purchases count" from customer c
32      join user u on c.id = u.customer_id
33      join customer_order co on co.customer_id = c.id
34      join customer_order_details cod on cod.customer_order_id = c.id
35      group by c.id
36      having sum(cod.quantity) >=
37          (select min(sqq.quantPurchased) from
38              (select sq.quantPurchased from
39                  (select distinct sum(cod.quantity) as quantPurchased from customer c
40                      join user u on c.id = u.customer_id
41                      join customer_order co on co.customer_id = c.id
42                      join customer_order_details cod on cod.customer_order_id = c.id
43                      group by c.id
44                      order by sum(cod.quantity) desc) sq
45                  order by sq.quantPurchased desc
46                  limit 5) sqq);
```

100% 18:46

Result Grid | Filter Rows: Search | Export:

first	last	purchases count
Alia	Goward	70
Margarita	Iglesia	126
Bear	Hamstead	48
Melissa	Seydlitz	105
Vicky	Gilmartin	48
Cornela	Wagenen	54

2. Which 5 customers have the oldest accounts?

```
8   # Which 5 customers have the oldest accounts?
9   select u.first as 'First Name', u.last as 'Last Name', c.created_at as 'Account Creation Date'from Customer c
10      join user u on c.id = u.Customer_id
11      group by c.id
12      having c.created_at <=
13          (select max(sq1.created_at) from
14              (select distinct c.created_at from Customer c
15                  join user u on c.id = u.Customer_id
16                  group by c.id
17                  order by c.created_at asc
18                  limit 5) sq1)
19      order by c.created_at asc;
```

100% 23:12

Result Grid | Filter Rows: Search | Export:

First Name	Last Name	Account Creation Date
Cosimo	Jervoise	2017-11-16 19:07:27
Bear	Hamstead	2017-11-18 09:07:00
Liam	Bonner	2017-11-19 02:37:23
Oberon	Tomas	2017-11-21 16:53:54
Dimitry	Aiskrigg	2017-11-26 18:19:22

3. Which state has the most customers?

```
21  # Which state has the most customers?
22  select state, count(c.id) as 'Total Customers in State'from Customer c
23      group by c.state
24      having  count(c.id) >=
25          (select count(c.id) as TotalState from Customer c
26              group by c.state
27              order by count(state) desc
28              limit 1);
```

100% 27:24

Result Grid | Filter Rows: Search | Export:

state	Total Customers in State
California	30

4. Which beer size has the most sales?

```
59  # Which beer size has the most sales?
60  select beer.size, sum(beer.price*cod.quantity) as 'gross_sales'  from beer
61     join customer_order_details cod on beer.id = cod.beer_id
62     group by beer.size
63     having sum(beer.price*cod.quantity) >=
64        (select sum(beer.price*cod.quantity) as 'gross_sales'  from beer
65           join customer_order_details cod on beer.id = cod.beer_id
66           group by beer.size
67           order by gross_sales desc
68           limit 1);
```

100% 7:64

Result Grid | Filter Rows: Search | Export:

size	gross_sales
1	20237.70

5. Which beer type has the most sales?

```
72  # Which beer type has the most sales?
73  select beer.type, sum(beer.price*cod.quantity) as 'gross_sales' from beer
74     join customer_order_details cod on beer.id = cod.beer_id
75     group by beer.type
76     having sum(beer.price*cod.quantity) >=
77        (select sum(beer.price*cod.quantity) as 'gross_sales' from beer
78           join customer_order_details cod on beer.id = cod.beer_id
79           group by beer.type
80           order by gross_sales desc
81           limit 1);
82
```

100% 15:77

Result Grid | Filter Rows: Search | Export:

type	gross_sales
Wheat	11695.06

6. Which active beer has sold the most in the least amount of time?

```
94  # Which active beer has sold the most in the least amount of time?
95  select beer.id, beer.name, sum(beer.price*inv_od.quantity) as 'gross_sales', datediff(now(), beer.created_at) as 'days_on_market',
96  sum(beer.price*inv_od.quantity)/datediff(now(), beer.created_at) as 'avg_sales_per_day' from beer
97      join inventory_purchase_order_details inv_od on beer.id = inv_od.beer_id
98      where active = 1
99      group by beer.id
100     having avg_sales_per_day >= (
101         select sum(beer.price*inv_od.quantity)/datediff(now(), beer.created_at) as 'avg_sales_per_day' from beer
102             join inventory_purchase_order_details inv_od on beer.id = inv_od.beer_id
103             where active = 1
104             group by beer.id
105             order by avg_sales_per_day desc
106             limit 1);
```

100% 15:102

Result Grid | Filter Rows: Search | Export:

id	name	gross_sales	days_on_market	avg_sales_per_day
6	K-Haus Cider	1894.80	107	17.708411

Sales

7. Which microbrewer has the highest sales?

```
88  # Which vendor has the highest sales?
89  select v.name, sum(cod.quantity * b.price) as "Total Sales" from vendor v
90     join beer b on b.vendor_id = v.id
91     join customer_order_details cod on cod.beer_id = b.id
92     group by v.id
93     having sum(cod.quantity * b.price) >=
94        (select sum(cod.quantity * b.price) as "Total Sales" from vendor v
95           join beer b on b.vendor_id = v.id
96           join customer_order_details cod on cod.beer_id = b.id
97           group by v.id
98           order by sum(cod.quantity * b.price) desc
99           limit 1);
100
```

100% 30:90

Result Grid | Filter Rows: Search | Export:

name	Total Sales
Rocky Beer	24454.47

8. Which country has the highest beer sales?

```
101 # Which country has the highest sales?
102 select v.country, sum(cod.quantity * b.price) as "Total Sales" from vendor v
103    join beer b on b.vendor_id = v.id
104    join customer_order_details cod on cod.beer_id = b.id
105    group by v.country
106    having sum(cod.quantity * b.price) >=
107       (select sum(cod.quantity * b.price) as "Total Sales" from vendor v
108          join beer b on b.vendor_id = v.id
109          join customer_order_details cod on cod.beer_id = b.id
110          group by v.country
111          order by sum(cod.quantity * b.price) desc
112          limit 1);
113
```

100% 36:106

Result Grid | Filter Rows: Search | Export:

country	Total Sales
Netherlands	36828.95

9. Which microbrewer has the longest-offered active beer?

```
138  # Which microbrewer has the longest-offered, active beer?
139  select v.name as 'Vendor', b.name as 'Beer',  b.created_at from beer b
140     join vendor v on b.vendor_id = v.id
141     where b.active = 1 and b.created_at <=
142        (select b.created_at from beer b
143           join vendor v on b.vendor_id = v.id
144           where b.active = 1
145           order by b.created_at asc
146           limit 1);
```

100% 28:143

Result Grid Filter Rows: Search Export:

Vendor	Beer	created_at
Kari Brews	Kari Stout	2017-11-28 03:44:48