Enter password: \*\*\*\* Welcome to the MySQL monitor. Commands end with ; or \g. Your MySQL connection id is 49

Server version: 8.0.43 MySQL Community Server - GPL

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Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> use itunes Database changed mysql> -- Apple iTunes Music Analysis: Business Questions and SQL Queries mysql> mysql> -- 1. Customer Analytics mysql> mysql> -- 1.1 Which customers have spent the most money on music? mysql> SELECT  $\rightarrow$ c.customer\_id,  $\rightarrow$  c.first\_name,  $\rightarrow$ c.last\_name,  $\rightarrow$ SUM(i.total) AS total\_spent

- $\rightarrow$  FROM Customer c
- → JOIN Invoice i ON c.customer\_id = i.customer\_id → GROUP BY c.customer\_id, c.first\_name, c.last\_name
- → ORDER BY total\_spent DESC
- $\rightarrow$  LIMIT 10;

_		L	L	L	_
	customer_id	first_name	last_name	total_spent	
	5	  FrantiÅ;ek	WichterlovÃ;	144.54000000000000	
	6	Helena	Holý	128.7	
	46	Hugh	O'Reilly	114.83999999999997	
	58	Manoj	Pareek	111.8699999999999	
	1	LuÃ-s	Gonçalves	108.8999999999998	
	13	Fernanda	Ramos	106.9199999999999	
	34	João	Fernandes	102.96000000000001	
	3	François	Tremblay	99.99	
١	42	Wyatt	Girard	99.99	
١	53	Phil	Hughes	98.01	
+		<b> </b>	<b> </b>	t	F

10 rows in set (0.01 sec)

mysql> -- 1.2 What is the average customer lifetime value (total spending)? mysql> SELECT AVG(customer\_total) AS avg\_lifetime\_value

- $\rightarrow$  FROM (
- SELECT customer\_id, SUM(total) as customer\_total
- → FROM Invoice
- ightarrow GROUP BY customer\_id
- → ) as customer\_totals;

```
avg_lifetime_value
  79.82084745762712
1 row in set (0.00 sec)
mysql>
mysql> -- 1.3 How many customers have made repeat purchases vs one-time purchases?
mysql> SELECT
         CASE WHEN purchase_count > 1 THEN 'Repeat Purchasers' ELSE 'One-time Purchasers' END
    \rightarrow
AS purchase_type,
         COUNT(*) AS customer_count
    \rightarrow FROM (
         SELECT customer_id, COUNT(invoice_id) AS purchase_count
    \rightarrow
         FROM Invoice
         GROUP BY customer_id
    → ) AS purchase_summary
    → GROUP BY purchase_type;
| purchase_type
                     | customer_count |
| Repeat Purchasers |
                                   59 |
1 row in set (0.00 sec)
mysql>
mysql> -- 1.4 Which country generates most revenue per customer?
mysql> SELECT c.country,
    \rightarrow
              AVG(i.total) AS avg_revenue_per_customer
    \rightarrow FROM Customer c
    → JOIN Invoice i ON c.customer_id = i.customer_id
    → GROUP BY c.country
    → ORDER BY avg_revenue_per_customer DESC;
                  | avg_revenue_per_customer
country
| Czech Republic |
                           9.108000000000002
| Spain
                                        8.91
| Ireland
                           8.833846153846151
| United Kingdom |
                           8.768571428571429
                            8.72142857142857
 India
| Belgium
                           8.627142857142855
| Germany
                           8.161463414634147
| Australia
                                       8.118
Norway
                           8.030000000000001
USA
                           7.942671755725189
| Argentina
                                        7.92
                                       7.821
| Hungary
                           7.781399999999998
France
| Austria
                           7.69999999999999
```

7.622999999999999

7.523999999999999

7.463076923076924

Poland

Sweden

| Chile

Finland	7.2
Canada	7.047236842105265
Brazil	7.0111475409836075
Netherlands	6.53400000000001
Portugal	6.383793103448276
Italy	5.61
Denmark	3.76199999999999999999
4	

## mysql>

mysql> -- 1.5 Customers inactive for last 6 months (assuming current date 2025-08-24)
mysql> SELECT c.customer\_id, c.first\_name, c.last\_name, MAX(i.invoice\_date) AS
last\_purchase\_date

- ightarrow FROM Customer c
- → LEFT JOIN Invoice i ON c.customer\_id = i.customer\_id
- → GROUP BY c.customer\_id, c.first\_name, c.last\_name
- $\rightarrow$  HAVING MAX(i.invoice\_date) < DATE\_SUB('2025-08-24', INTERVAL 6 MONTH) OR MAX(i.invoice\_date) IS NULL;

L	L	<b></b>	<del></del>
customer_id	first_name	last_name	last_purchase_date   +
1	LuÃ−s	Gonçalves	2020-07-24 00:00:00
2	Leonie	Köhler	2020-11-21 00:00:00
3	François	Tremblay	2020-05-16 00:00:00
4	Bjørn	Hansen	2020-02-04 00:00:00
5	FrantiÅ;ek	WichterlovÃ;	2020-11-12 00:00:00
6	Helena	Holý	2020-10-23 00:00:00
7	Astrid	Gruber	2020-08-26 00:00:00
8	Daan	Peeters	2019-09-21 00:00:00
9	Kara	Nielsen	2020-01-29 00:00:00
10	Eduardo	Martins	2020-06-25 00:00:00
11	Alexandre	Rocha	2020-06-24 00:00:00
12	Roberto	Almeida	2020-11-23 00:00:00
13	Fernanda	Ramos	2020-11-28 00:00:00
14	Mark	Philips	2020-12-20 00:00:00
15	Jennifer	Peterson	2020-12-18 00:00:00
16	Frank	Harris	2020-11-20 00:00:00
17	Jack	Smith	2020-09-11 00:00:00
18	Michelle	Brooks	2020-03-05 00:00:00
19	Tim	Goyer	2020-04-14 00:00:00
20	Dan	Miller	2020-12-29 00:00:00
21	Kathy	Chase	2020-12-09 00:00:00
22	Heather	Leacock	2020-10-30 00:00:00
23	John	Gordon	2020-11-27 00:00:00
24	Frank	Ralston	2020-10-25 00:00:00
25	Victor	Stevens	2020-10-21 00:00:00
26	Richard	Cunningham	2020-12-10 00:00:00
27	Patrick	Gray	2020-10-16 00:00:00
28	Julia	Barnett	2020-10-20 00:00:00
29	Robert	Brown	2020-12-08 00:00:00
30	Edward	Francis	2020-10-31 00:00:00
31	Martha	Silk	2020-11-24 00:00:00
32	Aaron	Mitchell	2020-10-26 00:00:00

```
33 | Ellie
                          Sullivan
                                         | 2020-12-27 00:00:00 |
          34 | João
                          Fernandes
                                         2020-10-13 00:00:00
          35 | Madalena
                          Sampaio
                                         2020-12-17 00:00:00
          36 | Hannah
                          Schneider
                                         2020-04-07 00:00:00
          37 | Fynn
                          Zimmermann
                                         2020-09-27 00:00:00
                          | Schröder
                                           2020-04-22 00:00:00
          38 | Niklas
          39 | Camille
                          Bernard
                                         2020-04-11 00:00:00
          40 | Dominique | Lefebvre
                                         2020-10-31 00:00:00
          41 | Marc
                          Dubois
                                         2020-11-12 00:00:00
          42 | Wyatt
                          Girard
                                         2020-11-27 00:00:00
          43 | Isabelle
                          Mercier
                                         2020-05-02 00:00:00
          44 | Terhi
                          | Hämäläinen | 2020-12-08 00:00:00
          45 | Ladislav
                          | KovÃ;cs
                                         2020-10-19 00:00:00
          46 | Hugh
                          | O'Reilly
                                         2020-12-12 00:00:00
          47 | Lucas
                          Mancini
                                         2020-10-06 00:00:00
          48 | Johannes
                         | Van der Berg | 2020-04-27 00:00:00
          49 | StanisÅ?aw | Wójcik
                                           2020-12-20 00:00:00
          50 | Enrique
                          Muñoz
                                          2020-06-10 00:00:00
          51 | Joakim
                          Johansson
                                         2020-11-17 00:00:00
          52 | Emma
                          Jones
                                         2020-12-27 00:00:00
          53 | Phil
                          | Hughes
                                         2020-12-30 00:00:00
          54 | Steve
                          | Murray
                                         2020-03-25 00:00:00
          55 | Mark
                          | Taylor
                                         | 2020-12-21 00:00:00
          56 | Diego
                          | GutiÃ@rrez
                                         2020-07-05 00:00:00
          57 | Luis
                          Rojas
                                          | 2020-06-09 00:00:00 |
          58 | Manoj
                          Pareek
                                         2020-07-15 00:00:00
          59 | Rishabh
                          | Mishra
                                          | 2020-12-19 00:00:00 |
59 rows in set (0.01 sec)
mysql>
mysql> -- 2. Sales & Revenue Analysis
mysql> -- 2.1 Monthly revenue trends for last two years
mysql> SELECT DATE_FORMAT(invoice_date, '%Y-%m') AS month, SUM(total) AS monthly_revenue
    → FROM Invoice
    → WHERE invoice_date ≥ DATE_SUB('2025-08-24', INTERVAL 2 YEAR)
    \rightarrow GROUP BY month
    → ORDER BY month;
Empty set (0.00 sec)
mysql> -- 2.2 Average value of an invoice (purchase)
mysql> SELECT AVG(total) AS avg_invoice_value
    → FROM Invoice;
| avg_invoice_value |
7.670081433224746
1 row in set (0.00 sec)
mvsql>
mysql> -- 2.3 [Add query for payment methods if data available]
```

# mysql> mysql> -- 2.4 Revenue contribution by each sales representative (employee) mysql> SELECT e.employee\_id, e.first\_name, e.last\_name, SUM(i.total) AS total\_revenue $\rightarrow$ FROM Employee e → JOIN Customer c ON e.employee\_id = c.support\_rep\_id → JOIN Invoice i ON c.customer\_id = i.customer\_id → GROUP BY e.employee\_id, e.first\_name, e.last\_name → ORDER BY total\_revenue DESC; employee\_id | first\_name | last\_name | total\_revenue 3 | Jane | Peacock | 1731.510000000004 | 4 | Margaret | Park | 1584.0000000000032 | | Johnson | 1393.9200000000028 | 5 Steve 3 rows in set (0.00 sec) mysql> mysql> -- 2.5 Peak sales months or quarters mysql> SELECT QUARTER(invoice\_date) AS quarter, YEAR(invoice\_date) AS year, SUM(total) AS total\_revenue $\rightarrow$ FROM Invoice ightarrow GROUP BY year, quarter → ORDER BY year, quarter; ----+-----+-

quarter	year	total_revenue
1	2017	372.23999999999995
2	2017	322.73999999999995
] 3	2017	304.91999999999996
4	2017	201.9599999999995
1	2018	448.4699999999986
2	2018	231.66
] 3	2018	248.4899999999995
4	2018	218.79000000000000
1	2019	270.27000000000004
2	2019	313.82999999999999
] 3	2019	410.84999999999997
4	2019	226.70999999999995
1	2020	218.79
2	2020	322.73999999999995
] 3	2020	243.53999999999994
4	2020	353.43
+	+	t+

16 rows in set (0.00 sec)

- ightarrow ORDER BY revenue DESC
- $\rightarrow$  LIMIT 10;

	track_id	name	revenue
+	13   9   46   151   153   1	Snowballed Mary Jane Behind The Wall Of Sleep Evil Woman For Those About To Rock (We Salute You)	:
ı	16	Dog Eat Dog	7.920000000000001
١	32	Deuces Are Wild	7.920000000000001
+	58   	Sunshine	7.920000000000001   +

#### mysql>

mysql> -- 3.2 Most frequently purchased albums

mysql> SELECT a.album\_id, a.title, COUNT(il.track\_id) AS purchase\_count

- $\rightarrow$  FROM Album a
- → JOIN Track t ON a.album\_id = t.album\_id
- → JOIN Invoice\_Line il ON t.track\_id = il.track\_id
- → GROUP BY a.album\_id, a.title
- ightarrow ORDER BY purchase\_count DESC
- $\rightarrow$  LIMIT 10;

_	L	<u> </u>	LL
	album_id	title	purchase_count
	5	Big Ones	80
	6	Jagged Little Pill	75
	1	For Those About To Rock We Salute You	74
	7	Facelift	59
	4	Let There Be Rock	50
	16	Black Sabbath	39
	9	Plays Metallica By Four Cellos	37
	10	Audioslave	33
	17	Black Sabbath Vol. 4 (Remaster)	29
	20	The Best Of Buddy Guy - The Millenium Collection	23
-		<del> </del>	·

10 rows in set (0.00 sec)

## mysql>

mysql> -- 3.3 Tracks or albums never purchased

mysql> -- Tracks never purchased

mysql> SELECT track\_id, name

- $\rightarrow$  FROM Track
- → WHERE track\_id NOT IN (SELECT DISTINCT track\_id FROM Invoice\_Line);

t:	rack_id	name	
 		Your Time Has Come Be Yourself	   

```
104 | Heaven's Dead
106 | Man Or Animal
107 | Yesterday To Tomorrow
111 | Money
112 | Long Tall Sally
113 | Bad Boy
114 | Twist And Shout
115 | Please Mr. Postman
116 | C'Mon Everybody
117 | Rock 'N' Roll Music
118 | Slow Down
119 | Roadrunner
120 | Carol
121 | Good Golly Miss Molly
122 | 20 Flight Rock
123 | Quadrant
124 | Snoopy's search-Red baron
125 | Spanish moss-"A sound portrait""-Spanish moss"
127 | Stratus
129 | Solo-Panhandler
133 | Stronger Than Death
136 | Phoney Smile Fake Hellos
141 | World Of Trouble
143 | The Begining ... At Last
144 | Heart Of Gold
145 | Snowblind
148 | The Beginning ... At Last
159 | FX
166 | Smoked Pork
167 | Body Count's In The House
168 | Now Sports
169 | Body Count
170 | A Statistic
171 | Bowels Of The Devil
173 | KKK Bitch
174 | D Note
175 | Voodoo
176 | The Winner Loses
177 | There Goes The Neighborhood
178 | Oprah
179 | Evil Dick
180 | Body Count Anthem
181 | Momma's Gotta Die Tonight
182 | Freedom Of Speech
185 | The Tower
187 | Book Of Thel
189 | Jerusalem
190 | Trupets Of Jericho
191 | Machine Men
192 | The Alchemist
193 | Realword
205 | Jorge Da Capadócia
209 | Eclipse Oculto
210 | Texto "Verdade Tropical"""
```

```
211 | Bem Devagar
213 | Saudosismo
214 | Carolina
215 | Sozinho
216 | Esse Cara
217 | Mel
218 | Linha Do Equador
220 | A Luz De Tieta
221 | AtrÃ;s Da Verd-E-Rosa Só Não Vai Quem JÃ; Morreu
223 | Sozinho (Hitmakers Classic Mix)
230 | Bye, Bye Brasil
231 | Atras Da Porta
232 | Tatuagem
234 | Morena De Angola
235 | Apesar De Você
236 | A Banda
238 | Com Açðcar E Com Afeto
239 | Brejo Da Cruz
240 | Meu Caro Amigo
241 | Geni E O Zepelim
242 | Trocando Em Miðdos
243 | Vai Trabalhar Vagabundo
244 | Gota D'água
245 | Construção / Deus Lhe Pague
246 | Mateus Enter
247 | O Cidadão Do Mundo
248 | Etnia
249 | Quilombo Groove [instrumental]
250 | MacÃ'
251 | Um Passeio No Mundo Livre
252 | Samba Do Lado
253 | Maracatu AtÃ'mico
254 | O Encontro De Isaac Asimov Com Santos Dumont No CÃ@u
255 | Corpo De Lama
256 | Sobremesa
257 | Manguetown
258 | Um Satélite Na Cabeça
259 | Baião Ambiental [instrumental]
260 | Sangue De Bairro
262 | Interlude Zumbi
263 | Criança De Domingo
264 | Amor De Muito
265 | Samidarish [instrumental]
266 | Maracatu Atã'mico [Atomic Version]
267 | Maracatu Atã'mico [Ragga Mix]
269 | Banditismo Por Uma Questa
270 | Banditismo Por Uma Questa
271 | Rios Pontes & Overdrives
272 | Cidade
273 | Praiera
274 | Samba Makossa
275 | Da Lama Ao Caos
276 | Maracatu De Tiro Certeiro
277 | Salustiano Song
```

```
278 | Antene Se
279 | Risoflora
280 | Lixo Do Mangue
281 | Computadores Fazem Arte
282 | Girassol
283 | A Sombra Da Maldade
284 | Johnny B. Goode
285 | Soldado Da Paz
286 | Firmamento
287 | Extra
288 | 0 Erê
289 | Podes Crer
290 | A Estrada
291 | Berlim
292 | JÃ; Foi
293 | Onde Você Mora?
294 | Pensamento
295 | Conciliação
296 | Realidade Virtual
297 | Mensagem
299 | Onde Você Mora?
300 | 0 Erê
302 | A Estrada
303 | Falar A Verdade
304 | Firmamento
305 | Pensamento
306 | Realidade Virtual
307 | Doutor
308 | Na Frente Da TV
309 | Downtown
310 | SÃ;bado A Noite
311 | A Cor Do Sol
312 | Eu Também Quero Beijar
313 | Noite Do Prazer
314 | Ã? Francesa
315 | Cada Um Cada Um (A Namoradeira)
316 | Linha Do Equador
317 | Amor Demais
318 | FÃ@rias
319 | Gostava Tanto De Você
320 | Flor Do Futuro
321 | Felicidade Urgente
322 | Livre Pra Viver
323 | Dig-Dig, Lambe-Lambe (Ao Vivo)
324 | Pererê
325 | TriboTchan
326 | Tapa Aqui, Descobre Ali
327 | Daniela
328 | Bate Lata
329 | Garotas do Brasil
330 | Levada do Amor (Ailoviu)
331 | Lavadeira
332 | Reboladeira
333 | � que Nessa Encarnação Eu Nasci Manga
```

```
335 | My Love
      336 | Latinha de Cerveja
      338 | I Can't Quit You Baby
      339 | Communication Breakdown
       343 | Communication Breakdown(2)
      345 | Whole Lotta Love
      347 | Communication Breakdown(3)
      351 | Debra Kadabra
      352 | Carolina Hard-Core Ecstasy
      353 | Sam With The Showing Scalp Flat Top
      354 | Poofter's Froth Wyoming Plans Ahead
       355 | 200 Years Old
      356 | Cucamonga
      357 | Advance Romance
      358 | Man With The Woman Head
       359 | Muffin Man
      360 | Vai-Vai 2001
      361 | X-9 2001
       362 | Gavioes 2001
184 rows in set (0.00 sec)
mvsql>
mysql> -- Albums never purchased
mysql> SELECT album_id, title

ightarrow FROM Album
   \rightarrow WHERE album_id NOT IN (
    → SELECT DISTINCT album_id FROM Track
   → WHERE track_id IN (SELECT DISTINCT track_id FROM Invoice_Line)
    \rightarrow );
| album_id | title
             12 | BackBeat Soundtrack
             25 | Da Lama Ao Caos
        28 | Na Pista
              1
        29 | AxA Bahia 2001
        31 | Bongo Fury
        32 | Carnaval 2001
        33 | Chill: Brazil (Disc 1)
        34 | Chill: Brazil (Disc 2)
        35 | Garage Inc. (Disc 1)
```

334 | Reggae Tchan

```
36 | Greatest Hits II
37 | Greatest Kiss
38 | Heart of the Night
39 | International Superhits
40 | Into The Light
41 | Meus Momentos
42 | Minha Hist�³ria
43 | MK III The Final Concerts [Disc 1]
44 | Physical Graffiti [Disc 1]
45 | Sambas De Enredo 2001
46 | Supernatural
47 | The Best of Ed Motta
48 | The Essential Miles Davis [Disc 1]
49 | The Essential Miles Davis [Disc 2]
50 | The Final Concerts (Disc 2)
51 | Up An' Atom
52 | VinÃ?Â-cius De Moraes - Sem Limite
53 | Vozes do MPB
54 | Chronicle, Vol. 1
55 | Chronicle, Vol. 2
56 | CÃ?Â;ssia Eller - ColeÃ?§Ã?£o Sem Limite [Disc 2]
57 | CÃ?Â;ssia Eller - Sem Limite [Disc 1]
58 | Come Taste The Band
59 | Deep Purple In Rock
60 | Fireball
61 | Knocking at Your Back Door: The Best Of Deep Purple in the 80's
62 | Machine Head
```

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63 | Purpendicular
64 | Slaves And Masters
65 | Stormbringer
66 | The Battle Rages On
67 | Vault: Def Leppard's Greatest Hits
68 | Outbreak
69 | Djavan Ao Vivo - Vol. 02
70 | Djavan Ao Vivo - Vol. 1
71 | Elis Regina-Minha Hist�³ria
72 | The Cream Of Clapton
73 | Unplugged
74 | Album Of The Year
75 | Angel Dust
76 | King For A Day Fool For A Lifetime
77 | The Real Thing
78 | Deixa Entrar
79 | In Your Honor [Disc 1]
80 | In Your Honor [Disc 2]
81 | One By One
82 | The Colour And The Shape
83 | My Way: The Best Of Frank Sinatra [Disc 1]
84 | Roda De Funk
85 | As Can�§Ã?µes de Eu Tu Eles
86 | Quanta Gente Veio Ver (Live)
87 | Quanta Gente Veio ver--BÃ?Â'nus De Carnaval
88 | Faceless
89 | American Idiot
```

```
90 | Appetite for Destruction
 91 | Use Your Illusion I
 92 | Use Your Illusion II
 93 | Blue Moods
 94 | A Matter of Life and Death
 95 | A Real Dead One
 96 | A Real Live One
 97 | Brave New World
 98 | Dance Of Death
 99 | Fear Of The Dark
100 | Iron Maiden
101 | Killers
102 | Live After Death
103 | Live At Donington 1992 (Disc 1)
104 | Live At Donington 1992 (Disc 2)
105 | No Prayer For The Dying
106 | Piece Of Mind
107 | Powerslave
108 | Rock In Rio [cd1]
109 | Rock In Rio [cd2]
110 | Seventh Son of a Seventh Son
111 | Somewhere in Time
112 | The Number of The Beast
113 | The X Factor
114 | Virtual XI
115 | Sex Machine
116 | Emergency On Planet Earth
```

```
117 | Synkronized
118 | The Return Of The Space Cowboy
119 | Get Born
120 | Are You Experienced?
121 | Surfing with the Alien (Remastered)
122 | Jorge Ben Jor 25 Anos
123 | Jota Quest-1995
124 | Cafezinho
125 | Living After Midnight
126 | Unplugged [live]
127 | BBC Sessions [Disc 2] [live]
128 | Coda
129 | Houses Of The Holy
130 | In Through The Out Door
131 | IV
132 | Led Zeppelin I
133 | Led Zeppelin II
134 | Led Zeppelin III
135 | Physical Graffiti [Disc 2]
136 | Presence
137 | The Song Remains The Same (Disc 1)
138 | The Song Remains The Same (Disc 2)
139 | A TempestadeTempestade Ou O Livro Dos Dias
140 | Mais Do Mesmo
141 | Greatest Hits
142 | Lulu Santos - RCA 100 Anos De M�°sica - Ã?Â?lbum 01
143 | Lulu Santos - RCA 100 Anos De M�°sica - Ã?Â?lbum 02
```

```
144 | Misplaced Childhood
145 | Barulhinho Bom
146 | Seek And Shall Find: More Of The Best (1963-1981)
147 | The Best Of Men At Work
148 | Black Album
149 | Garage Inc. (Disc 2)
150 | Kill 'Em All
151 | Load
152 | Master Of Puppets
153 | ReLoad
154 | Ride The Lightning
155 | St. Anger
156 | And Justice For All
157 | Miles Ahead
158 | Milton Nascimento Ao Vivo
159 | Minas
160 | Ace Of Spades
161 | Demorou ...
162 | Motley Crue Greatest Hits
163 | From The Muddy Banks Of The Wishkah [live]
164 | Nevermind
165 | Compositores
166 | Olodum
167 | Acastico MTV
168 | Arquivo II
169 | Arquivo Os Paralamas Do Sucesso
170 | Bark at the Moon (Remastered)
```

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171 | Blizzard of Ozz
172 | Diary of a Madman (Remastered)
173 | No More Tears (Remastered)
174 | Tribute
175 | Walking Into Clarksdale
176 | Original Soundtracks 1
177 | The Beast Live
178 | Live On Two Legs [live]
179 | Pearl Jam
180 | Riot Act
181 | Ten
182 | Vs.
183 | Dark Side Of The Moon
184 | Os C�£es Ladram Mas A Caravana NÃ?£o PÃ?Â;ra
185 | Greatest Hits I
186 | News Of The World
187 | Out Of Time
188 | Green
189 | New Adventures In Hi-Fi
190 | The Best Of R.E.M.: The IRS Years
191 | Cesta BÃ?Â;sica
192 | Raul Seixas
193 | Blood Sugar Sex Magik
194 | By The Way
195 | Californication
196 | Retrospective I (1974-1980)
197 | Santana - As Years Go By
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198 | Santana Live
199 | Maquinarama
200 | O Samba Pocon�©
201 | Judas 0: B-Sides and Rarities
202 | Rotten Apples: Greatest Hits
203 | A-Sides
204 | Morning Dance
205 | In Step
206 | Core
207 | Mezmerize
208 | Black Light Syndrome
209 | Live [Disc 1]
210 | Live [Disc 2]
211 | The Singles
212 | Beyond Good And Evil
213 | Pure Cult: The Best Of The Cult (For Rockers, Ravers, Lovers & Sinners) [uk]
214 | The Doors
215 | The Police Greatest Hits
216 | Hot Rocks, 1964-1971 (Disc 1)
217 | No Security
218 | Voodoo Lounge
219 | Tangents
220 | Transmission
221 | My Generation - The Very Best Of The Who
222 | Serie Sem Limite (Disc 1)
223 | Serie Sem Limite (Disc 2)
224 | Acastico
```

```
225 | Volume Dois
226 | Battlestar Galactica: The Story So Far
227 | Battlestar Galactica, Season 3
228 | Heroes, Season 1
229 | Lost, Season 3
230 | Lost, Season 1
231 | Lost, Season 2
232 | Achtung Baby
233 | All That You Can't Leave Behind
234 | B-Sides 1980-1990
235 | How To Dismantle An Atomic Bomb
236 | Pop
237 | Rattle And Hum
238 | The Best Of 1980-1990
239 | War
240 | Zooropa
241 | UB40 The Best Of - Volume Two [uk]
242 | Diver Down
243 | The Best Of Van Halen, Vol. I
244 | Van Halen
245 | Van Halen III
246 | Contraband
247 | Vinicius De Moraes
248 | Ao Vivo [import]
249 | The Office, Season 1
250 | The Office, Season 2
251 | The Office, Season 3
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252 | Un-Led-Ed
253 | Battlestar Galactica (Classic), Season 1
254 | Aquaman
255 | Instant Karma: The Amnesty International Campaign to Save Darfur
256 | Speak of the Devil
257 | 20th Century Masters - The Millennium Collection: The Best of Scorpions
258 | House of Pain
259 | Radio Brasil (O Som da Jovem Vanguarda) - Seleccao de Henrique Amaro
260 | Cake: B-Sides and Rarities
261 | LOST, Season 4
262 | Quiet Songs
263 | Muso Ko
264 | Realize
265 | Every Kind of Light
266 | Duos II
267 | Worlds
268 | The Best of Beethoven
269 | Temple of the Dog
270 | Carry On
271 | Revelations
272 | Adorate Deum: Gregorian Chant from the Proper of the Mass
273 | Allegri: Miserere
274 | Pachelbel: Canon & Gigue
275 | Vivaldi: The Four Seasons
276 | Bach: Violin Concertos
277 | Bach: Goldberg Variations
278 | Bach: The Cello Suites
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279 | Handel: The Messiah (Highlights)
280 | The World of Classical Favourites
281 | Sir Neville Marriner: A Celebration
282 | Mozart: Wind Concertos
283 | Haydn: Symphonies 99 - 104
284 | Beethoven: Symbonies Nos. 5 & 6
285 | A Soprano Inspired
286 | Great Opera Choruses
287 | Wagner: Favourite Overtures
288 | Faur�©: Requiem, Ravel: Pavane & Others
289 | Tchaikovsky: The Nutcracker
290 | The Last Night of the Proms
291 | Puccini: Madama Butterfly - Highlights
292 | Holst: The Planets, Op. 32 & Vaughan Williams: Fantasies
293 | Pavarotti's Opera Made Easy
294 | Great Performances - Barber's Adagio and Other Romantic Favorites for Strings
295 | Carmina Burana
296 | A Copland Celebration, Vol. I
297 | Bach: Toccata & Fugue in D Minor
298 | Prokofiev: Symphony No.1
299 | Scheherazade
300 | Bach: The Brandenburg Concertos
301 | Chopin: Piano Concertos Nos. 1 & 2
302 | Mascagni: Cavalleria Rusticana
303 | Sibelius: Finlandia
304 | Beethoven Piano Sonatas: Moonlight & Pastorale
305 | Great Recordings of the Century - Mahler: Das Lied von der Erde
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306 | Elgar: Cello Concerto & Vaughan Williams: Fantasias
      307 | Adams, John: The Chairman Dances
       308 | Tchaikovsky: 1812 Festival Overture, Op.49, Capriccio Italien & Beethoven:
Wellington's Victory |
      309 | Palestrina: Missa Papae Marcelli & Allegri: Miserere
      310 | Prokofiev: Romeo & Juliet
      311 | Strauss: Waltzes
      312 | Berlioz: Symphonie Fantastique
       313 | Bizet: Carmen Highlights
       314 | English Renaissance
      315 | Handel: Music for the Royal Fireworks (Original Version 1749)
       316 | Grieg: Peer Gynt Suites & Sibelius: PellÃ?Â@as et MÃ?Â@lisande
       317 | Mozart Gala: Famous Arias
      318 | SCRIABIN: Vers la flamme
      319 | Armada: Music from the Courts of England and Spain
      320 | Mozart: Symphonies Nos. 40 & 41
      321 | Back to Black
      322 | Frank
      323 | Carried to Dust (Bonus Track Version)
       324 | Beethoven: Symphony No. 6 'Pastoral' Etc.
       325 | Bartok: Violin & Viola Concertos
      326 | Mendelssohn: A Midsummer Night's Dream
       327 | Bach: Orchestral Suites Nos. 1 to 4
       328 | Charpentier: Divertissements, Airs & Concerts
      329 | South American Getaway
      330 | G�³recki: Symphony No. 3
       331 | Purcell: The Fairy Queen
       332 | The Ultimate Relexation Album
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333 | Purcell: Music for the Queen Mary
      334 | Weill: The Seven Deadly Sins
      335 | J.S. Bach: Chaconne, Suite in E Minor, Partita in E Major & Prelude, Fugue and
Allegro
      336 | Prokofiev: Symphony No.5 & Stravinksy: Le Sacre Du Printemps
      337 | Szymanowski: Piano Works, Vol. 1
      338 | Nielsen: The Six Symphonies
      339 | Great Recordings of the Century: Paganini's 24 Caprices
       340 | Liszt - 12 Ã?â?°tudes D'Execution Transcendante
       341 | Great Recordings of the Century - Shubert: Schwanengesang, 4 Lieder
      342 | Locatelli: Concertos for Violin, Strings and Continuo, Vol. 3
       343 | Respighi:Pines of Rome
       344 | Schubert: The Late String Quartets & String Quintet (3 CD's)
      345 | Monteverdi: L'Orfeo
      346 | Mozart: Chamber Music
      347 | Koyaanisqatsi (Soundtrack from the Motion Picture)
321 rows in set (0.00 sec)
mysql>
mysql> -- 3.4 Average price per track by genre
mysql> SELECT g.name AS genre, AVG(t.unit_price) AS avg_price

ightarrow FROM Genre g
   → JOIN Track t ON g.genre_id = t.genre_id
   \rightarrow GROUP BY g.name
    → ORDER BY avg_price DESC;
genre
                     | avg_price
 Metal
                     0.9900000000000000
| Rock And Roll
                     0.9900000000000001
Blues
                     0.9900000000000000
Pop
                    0.9900000000000000
Soundtrack
                    0.989999999999999
Jazz
                    0.98999999999999
| Alternative & Punk | 0.989999999999999 |
Reggae
                    0.98999999999999
                     0.9899999999999991 |
| Latin
```

genre	track_count	tracks_sold
Rock	404	390
Metal	139	124
Blues	23	23
Jazz	27	22
Latin	90	19
Alternative & Punk	33	12
Reggae	31	2
Rock And Roll	12	9
Pop	14	Θ
Soundtrack	3	Θ
Bossa Nova	0	0
Easy Listening	0	9
Heavy Metal	0	0
R&B/Soul	0	0
Electronica/Dance	0	0
World	0	9
Hip Hop/Rap	0	9
Science Fiction	0	9
TV Shows	0	9
Sci Fi & Fantasy	0	9
Drama	0	9
Comedy	0	0
Alternative	0	0
Classical	0	0

25 rows in set (0.01 sec)

- → GROUP BY ar.artist\_id, ar.name
- → ORDER BY total\_revenue DESC
- $\rightarrow$  LIMIT 5;

artist_id	name	total_revenue
3     4     12	AC/DC   Aerosmith   Alanis Morissette   Black Sabbath   Alice In Chains	122.75999999999974   79.19999999999996   74.24999999999999   67.3200000000000002   58.4100000000000003

### mysql>

mysql> -- 4.2 Popular genres by number of tracks sold and revenue mysql> SELECT g.genre\_id, g.name,

- → COUNT(il.invoice\_line\_id) AS tracks\_sold,
- → SUM(il.unit\_price \* il.quantity) AS total\_revenue
- $\rightarrow$  FROM Genre g
- → JOIN Track t ON g.genre\_id = t.genre\_id
- → LEFT JOIN Invoice\_Line il ON t.track\_id = il.track\_id
- $\rightarrow$  GROUP BY g.genre\_id, g.name
- → ORDER BY total\_revenue DESC;

4	L	L	L	L
İ	genre_id	name	tracks_sold	total_revenue
	1	Rock	390	386.10000000000207
	3   6	Metal   Blues	124     23	122.75999999999974     22.769999999999992
	2	Jazz	22	21.77999999999994
	7	Latin	19	18.81
	4	Alternative & Punk	12	11.88
	8	Reggae	2	1.98
	5	Rock And Roll	0	NULL
	9	Pop	0	NULL
	10	Soundtrack	0	NULL

10 rows in set (0.00 sec)

#### mvsql>

mysql> -- 4.3 Genre popularity by country (example: top genre per country revenue) mysql> SELECT c.country, g.name AS genre, SUM(il.unit\_price \* il.quantity) AS revenue

- $\rightarrow$  FROM Customer c
- → JOIN Invoice i ON c.customer\_id = i.customer\_id
- → JOIN Invoice\_Line il ON i.invoice\_id = il.invoice\_id
- → JOIN Track t ON il.track\_id = t.track\_id
- → JOIN Genre g ON t.genre\_id = g.genre\_id
- $\rightarrow$  GROUP BY c.country, g.name
- → ORDER BY c.country, revenue DESC;

country	genre	revenue
Argentina	Rock	0.99

	A	l Darata	1E 02
	Australia Australia	Rock	17.82
1		Metal	0.99
	Austria	Rock	5.94
	Austria	Metal	2.9699999999999998
	Belgium	Rock	4.95
!	Belgium	Metal	2.9699999999999998
	Brazil	Rock	25.73999999999988
	Brazil	Jazz	13.860000000000001
	Brazil	Metal	11.88
	Brazil	Latin	3.96
!	Brazil	Alternative & Punk	0.99
	Canada	Rock	56.43000000000003
	Canada	Metal	21.7799999999999999
!	Canada	Blues	1.98
ļ	Canada	Latin	1.98
ļ	Canada	Jazz	0.99
ļ	Canada	Alternative & Punk	0.99
ļ	Chile	Rock	6.930000000000001
ļ	Chile	Metal	3.96
ļ	Chile	Latin	0.99
ļ	Czech Republic	Rock	13.860000000000001
	Czech Republic	Metal	2.969999999999998
	Czech Republic	Latin	1.98
	Czech Republic	Jazz	0.99
	Denmark	Rock	5.94
	Finland	Rock	5.94
	France	Rock	25.73999999999988
	France	Metal	11.88
	France	Latin	2.969999999999998
	France	Jazz	1.98
	France	Blues	0.99
	France	Alternative & Punk	0.99
	Germany	Rock	27.71999999999985
	Germany	Metal	5.94
	Germany	Blues	2.969999999999998
	Germany	Alternative & Punk	1.98
	Germany	Latin	1.98
	Germany	Jazz	0.99
	Hungary	Rock	3.96
	Hungary	Alternative & Punk	0.99
	Hungary	Metal	0.99
	India	Rock	12.870000000000001
	India	Metal	4.95
	India	Alternative & Punk	0.99
	India	Latin	0.99
	Ireland	Rock	1.98
1	Ireland	Metal	0.99
Ì	Italy	Rock	2.9699999999999998
ĺ	Netherlands	Rock	5.94
ĺ	Netherlands	Blues	1.98
ĺ	Norway	Metal	1.98
i	Norway	Rock	0.99
i	Norway	Alternative & Punk	0.99
i	Poland	Rock	13.8600000000000001
'		- · ·	

	Poland	Blues	10.89
١	Poland	Metal	1.98
١	Portugal	Rock	22.76999999999999
١	Portugal	Metal	2.969999999999998
	Portugal	Alternative & Punk	0.99
	Spain	Metal	3.96
	Spain	Rock	1.98
	Spain	Reggae	0.99
	Spain	Latin	0.99
	Sweden	Rock	4.95
	Sweden	Metal	0.99
	Sweden	Blues	0.99
	United Kingdom	Rock	46.53000000000001
١	United Kingdom	Metal	4.95
	United Kingdom	Jazz	0.99
	United Kingdom	Alternative & Punk	0.99
	United Kingdom	Latin	0.99
	United Kingdom	Reggae	0.99
	USA	Rock	69.30000000000001
	USA	Metal	33.65999999999998
	USA	Blues	2.969999999999998
١	USA	Jazz	1.98
١	USA	Alternative & Punk	1.98
١	USA	Latin	1.98
+		ł <del></del> -	t

```
mysql>
```

mysql> -- 5. Employee & Operational Efficiency

mvsal>

mysql> -- 5.1 Employees managing highest-spending customers

mysql> SELECT e.employee\_id, e.first\_name, e.last\_name, SUM(i.total) AS total\_customer\_revenue

- $\rightarrow$  FROM Employee e
- → JOIN Customer c ON e.employee\_id = c.support\_rep\_id
- → JOIN Invoice i ON c.customer\_id = i.customer\_id
- → GROUP BY e.employee\_id, e.first\_name, e.last\_name
- → ORDER BY total\_customer\_revenue DESC;

employee_id	first_name	last_name	total_customer_revenue
4		   Peacock   Park   Johnson	1731.510000000004   1584.0000000000032   1393.9200000000028

3 rows in set (0.01 sec)

```
mvsal>
```

mysql> -- 5.2 Average number of customers per employee

mysql> SELECT AVG(customer\_counts.customer\_count) AS avg\_customers\_per\_employee

- ightarrow FROM (
- → SELECT support\_rep\_id, COUNT(customer\_id) AS customer\_count
- ightarrow FROM Customer
- → GROUP BY support\_rep\_id
- ightarrow ) AS customer\_counts;

```
| avg_customers_per_employee |
                      19.6667
1 row in set (0.00 sec)
mysql>
mysql> -- 5.3 Employee regions bringing most revenue (assuming employee location in country
field)
mysql> SELECT e.country, SUM(i.total) AS total_revenue
    \rightarrow FROM Employee e
    → JOIN Customer c ON e.employee_id = c.support_rep_id
    → JOIN Invoice i ON c.customer_id = i.customer_id
    → GROUP BY e.country
    → ORDER BY total_revenue DESC;
| country | total_revenue
| Canada | 4709.42999999999 |
1 row in set (0.00 sec)
mvsql>
mysql> -- 6. Geographic Trends
mysql> -- 6.1 Countries with highest number of customers
mysql> SELECT country, COUNT(customer_id) AS customer_count
    \rightarrow \ \mathsf{FROM} \ \mathsf{Customer}
    \rightarrow GROUP BY country
    → ORDER BY customer_count DESC;
                  | customer_count |
country
USA
                                 13
Canada
                                 8 |
| Brazil
                                 5 |
France
                                 5 |
| Germany
                                 4
                                 3 |
| United Kingdom |
| Czech Republic |
                                 2 |
| Portugal
                                  2 |
| India
                                 2
Norway
| Austria
                                 1 |
```

1

1 |

1 |

1

1

1 |

1 |

1 |

| Belgium | Denmark

| Finland

| Hungary

| Ireland

Netherlands

| Italy

Poland

| Spain

```
Sweden
                                1 |
| Australia
                                1 |
| Argentina
                                1 |
| Chile
                                1 |
24 rows in set (0.00 sec)
mysql>
mysql> -- 6.2 Revenue variation by region (country)
mysql> SELECT billing_country, SUM(total) AS total_revenue
    \rightarrow FROM Invoice
    → GROUP BY billing_country
    → ORDER BY total_revenue DESC;
| billing_country | total_revenue
 USA
                    1040.489999999999
                     535.59000000000001
Canada
                    427.68000000000006
| Brazil
                     389.069999999999
France
| Germany
                                334.62
| Czech Republic
                    273.240000000000007
| United Kingdom
                                245.52
| Portugal
                    185.13000000000000
                    183.14999999999998
| India
| Ireland
                    114.83999999999997
```

| Spain

| Chile

| Australia

| Finland

Poland

Sweden

| Norway | Austria

| Belgium

| Argentina

Denmark

| Italy

Netherlands

Hungary

98.01

81.18

78.21

75.24

69.3

65.34

50.49

39.6

79.2

97.02000000000001

76.22999999999999

72.27000000000001

60.3899999999999

37.619999999999999

ightarrow ) AS purchases

ightarrow GROUP BY purchase\_count

ightarrow ORDER BY purchase\_count;

| pct\_customers\_multi\_genre |

4		L		
purchase_count	num_customers			
4	l 1	<del>*</del> 		
5	1			
7	1			
8	6			
9	12			
10	12			
11	9			
12	8			
13	6			
15	1			
16	1 1	 		
18	i +			
12 rows in set (0		•		
12 10W3 111 3ec (0	.00 360)			
mysql>				
	rage time betwee	n customer purchases		
mysql> WITH custor	-	•		
→ SELECT CI	ustomer_id, invo	ice_date,		
→ LF	EAD(invoice_date)	OVER (PARTITION BY customer_id ORDER BY invoice_date) AS		
next_purchase_date	e			
ightarrow FROM Invo	oice			
$\rightarrow$ )				
		urchase_date, invoice_date)) AS avg_days_between_purchases		
ightarrow FROM custor				
ightarrow WHERE next	_purchase_date IS	S NOT NULL;		
+	+			
avg_days_between	1_purchases			
1	122 2502			
1	132.2793			
1 row in set (0.00	9 soc)			
1 10W 111 Set (0.00	) Sec)			
mysql>				
	centage of custor	mers purchasing tracks from more than one genre		
		mers parenasing cracks from more chair one genic		
<pre>mysql&gt; WITH customer_genres AS (</pre>				
→ FROM Customer c				
→ JOIN Invoice i ON c.customer_id = i.customer_id				
→ JOIN Invoice_Line il ON i.invoice_id = il.invoice_id				
→ JOIN Track t ON il.track_id = t.track_id				
ightarrow )				
→ SELECT				
→ (SELECT COUNT(DISTINCT customer_id) FROM customer_genres WHERE customer_id IN (				
		<pre>1 customer_genres GROUP BY customer_id HAVING COUNT(DISTINCT</pre>		
genre_id) > 1)				
$\rightarrow$ ) * 100.0	<pre>0 / COUNT(DISTING</pre>	CT customer_id) AS pct_customers_multi_genre		
ightarrow FROM custon	mer_genres;	-		
+	+			

mysql>

mysql> -- 8. Operational Optimization

mvsql>

mysql> -- 8.1 Most common combinations of tracks purchased together (top 10 pairs) mysql> SELECT ill.track\_id AS track1, il2.track\_id AS track2, COUNT(\*) AS pair\_count

→ FROM Invoice\_Line il1

→ JOIN Invoice\_Line il2 ON il1.invoice\_id = il2.invoice\_id AND il1.track\_id < il2.track\_id</p>

- → GROUP BY il1.track\_id, il2.track\_id
- → ORDER BY pair\_count DESC
- $\rightarrow$  LIMIT 10;

	track1	track2	pair_count
Ī	1	8	4
Ι	1	14	4
	1	11	4
	1	9	4
	8	11	4
	8	9	4
	1	12	4
	1	10	4
Ι	8	10	4
I	6	8	4
+-		<b>+</b>	+

10 rows in set (0.00 sec)

mysql>

mysql> -- 8.2 Pricing patterns leading to higher or lower sales (average quantity sold by unit price bands)

mysql> SELECT unit\_price, AVG(quantity) AS avg\_quantity\_sold, COUNT(\*) AS num\_sales

- → FROM Invoice\_Line
- $\rightarrow$  GROUP BY unit\_price
- → ORDER BY unit\_price;

unit_price	avg_quantity_sold	num_sales
0.99	1.0000	592

1 row in set (0.00 sec)

mvsal>

mysql> -- 8.3 Trends of media type usage (increasing or decreasing sales over time)
mysql> SELECT mt.name AS media\_type, DATE\_FORMAT(i.invoice\_date, '%Y-%m') AS month,
COUNT(il.invoice\_line\_id) AS sales\_count

- → FROM Invoice\_Line il
- → JOIN Track t ON il.track\_id = t.track\_id
- → JOIN Media\_Type mt ON t.media\_type\_id = mt.media\_type\_id
- → JOIN Invoice i ON il.invoice\_id = i.invoice\_id

- ightarrow GROUP BY mt.name, month
- $\rightarrow$  ORDER BY month, media\_type;

media_type		sales_count
	2017-01	14
MPEG audio file	2017-02	36
MPEG audio file	2017-03	12
MPEG audio file	2017-04	23
MPEG audio file	2017-05	26
MPEG audio file	2017-06	1
MPEG audio file	2017-07	9
MPEG audio file	2017-08	9
Protected AAC audio file	2017-08	1
MPEG audio file	2017-09	17
Protected AAC audio file	2017-09	1
MPEG audio file	2017-10	8
Protected AAC audio file	2017-10	1
MPEG audio file	2017-11	21
MPEG audio file	2018-01	10
MPEG audio file	2018-02	6
MPEG audio file	2018-03	23
MPEG audio file	2018-04	2
MPEG audio file	2018-05	15
MPEG audio file	2018-06	6
MPEG audio file	2018-07	11
MPEG audio file	2018-08	20
MPEG audio file	2018-09	] 3
MPEG audio file	2018-10	13
MPEG audio file	2018-11	4
Protected AAC audio file	2018-11	1
MPEG audio file	2018-12	23
Protected AAC audio file	2018-12	1
MPEG audio file	2019-01	14
MPEG audio file	2019-02	7
MPEG audio file	2019-03	8
MPEG audio file	2019-04	9
MPEG audio file	2019-05	13
MPEG audio file	2019-06	] 3
MPEG audio file	2019-07	10
MPEG audio file	2019-08	19
MPEG audio file	2019-09	28
Protected AAC audio file	2019-09	1
MPEG audio file	2019-10	4
MPEG audio file	2019-11	11
MPEG audio file	2019-12	22
MPEG audio file	2020-01	11
MPEG audio file	2020-02	10
MPEG audio file	2020-03	2
MPEG audio file	2020-04	18
Protected AAC audio file	2020-04	1
MPEG audio file	2020-05	13
MPEG audio file	2020-06	22
MPEG audio file	2020-07	3

MPEG audio file	2020-08	2
Protected AAC audio file	2020-08	1
MPEG audio file	2020-09	6
MPEG audio file	2020-10	12
Protected AAC audio file	2020-10	1
MPEG audio file	2020-11	16
MPEG audio file	2020-12	8
<b>4</b>	<b>.</b>	

mysql>