

index

A

AAD *See* Azure Active Directory
access token 531, 537
ACE OLE DB provider 236
active relationships 246
ActivityEvents API 376
ADAL 505
Admin API 373
Admin Portal 70, 367
aggregation hits 442
aggregation table 441
aggregations
 automatic 443
 user-defined 441
AI Transforms 358
alerts 21, 112, 116, 140
 in Power BI Mobile 145
ALL function 275, 288
ALLEXCEPT function 275
ALLNOBLANKROW function 275
Always On 178
Analysis Services
 connecting to 66, 165
 importing data from 187
 integrating with Power BI 455
analytical features 260
Analytics tab 81
Analyze in Excel 51, 55, 107, 372, 418
 for drilling through 306
Android native app 140
animation 560
annotations 25, 153
anomaly detection 336
App Owns Data 540
apps
 creating 387
 navigation 387
 removing 390
AppSource 35, 37, 62, 80, 389
ArcGIS 87, 372
Area Chart 83
attributes 158
auditing 374
auto recovery 172
AutoComplete 274
AutoML 23, 344
 evaluating 348
 training 347

auto-scale 405
AVERAGEX function 274
Azure Active Directory 28, 46
 external users 393
Azure Analysis Services 53
Azure Blob Storage 475
Azure Cognitive Services 358
Azure Data Factory 12
Azure DevOps 357
Azure Event Hubs 475, 478
Azure IoT Hub 475
Azure Kubernetes Service 357
Azure Machine Learning 8, 12, 36, 352
Azure Management Portal 507
Azure Map 86
Azure Preview 12
Azure Private Link 365, 374
Azure SQL Data Warehouse 30
Azure SQL Database 53
Azure Stream Analytics 12, 478
Azure Synapse Analytics 53
Azure Table Storage 12
Azure Traffic Manager 28
AzureML 352, 358

B

B2B 392
B2C 392
balanced scorecard 131
Bar Chart 83, 96
barcodes 141
Basic Map 87
BI Center of Excellence 420
BI pro 35
bidirectional relationships 163
Binary data type 235
binary prediction 344
binning 310
BISM 423
bitness considerations 168
Bookmark navigator 326
bookmarks 72, 323
 personal 104
Bookmarks pane 174, 323, 325
branding 370
Build permission 417
Bullet Chart 93
business intelligence 1

Business Performance Management 131
business user 32

C

CALCULATE function 275, 276, 288
calculated columns
 and row context 268
 implementing 279
 introducing 268
 storage 268
 when to use 269
calculated tables 278
CALCULATETABLE function 275
CALENDAR function 160
CALENDARAUTO function 160
calendars 377
Canvas 37
Canvas apps 484
Capacity Admins 410
capacity nodes 401
Capacity settings 410
capacity usage report 412
capacity workloads 412
CDM folders 224
certified datasets 371, 416
certified entities 221
chromeless mode 51
cloud services 53
Clustered Bar Chart 83
Clustered Column Chart 83
clustering 331
collaborative features 376
Column Chart 83, 96, 98
column from examples 196, 205
columns
 hiding 237
 referencing in DAX 273
 removing 237
 renaming 237
 resizing 237
 sorting 238
columnstore index 7, 164
Combination Chart 84
Combo Chart 98
comments 75, 113, 117
 in Power BI Mobile 152
Common Data Model 219
community 174

- composite models 34, 434
- compute target 355
- computed table 222
- conditional access 364
- conditional column 196
- conditional formatting 86, 312
- confidential data 420
- connected goal 134
- consulting services 174
- Content Delivery Network 29
- correlations 100
- Cosmos DB 12
- Cost-Benefit Analysis chart 349
- COUNT function 274, 275
- COUNTA function 275
- COUNTAX function 274, 275
- COUNTBLANK function 275
- COUNTROWS function 275
- COUNTX function 275
- Create Relationship window 250
- cross filter direction 251
- cross filtering 162, 247
- cross highlighting 20
- crosstab report 299
- CSS 551
- CSV export 74
- CSV files 185
- Cumulative Gains chart 349
- Currency data type 235
- custom apps
 - permissions 506
 - registering 529
 - registering in Azure 507
- custom columns
 - adding in query 205
 - in Query Editor 195
- custom connectors 177
- custom page sizes 72
- custom sorting 233, 238
- custom visuals 34, 37
 - capabilities 561
 - certified 372
 - debugging 556
 - enabling 372
 - host integration 548
 - importing 80, 565
 - packaging 563
 - publishing 564
 - understanding 92, 547
- CustomData 394
- D**
- D3.js 37, 551
- dashboards
 - actions 60
 - API 497
 - creating 60
 - defined 59
 - distributing 60
 - duplicating 117
 - featured 47
 - in Power BI portal 49
 - options for creating 121
 - Power BI Mobile 144
 - sharing 119, 144
 - sharing in Power BI Mobile 152
 - tagging 418
 - understanding 111
 - working with 127
- Data Analysis Expressions 424
- data analyst 33
- data bars 312
- data categories 263
- data classification 373, 418
- data collation 233
- data connectors 37
- data entry form 486
- data frames 341
- data governance 415
- data import API 499
- Data Lake 224
- data mart 423
- Data Mining add-in 8
- data models
 - publishing 170
 - understanding 157
- data point table 305
- data profiling 197
- data refresh 384
- data region 363
- data security 445
 - and embedding 545
 - and workspaces 382
 - testing 448
- data sources
 - managing 470
 - settings 240
 - types of access 53
- data staging 221
- data storytelling 319
- data types 235
 - reason for changing 236
- Data View 231
- data warehouse 423
- data warehousing 35, 41
- Data-driven Documents *See* D3.js
- data-driven subscriptions 464
- dataflow tables 222
- dataflows
 - connecting to 228
 - enabling 373
 - exporting 227
 - introduced 22
 - settings 369
 - storage 224
 - streaming 474
 - used for AutoML 344
 - when to use 221
- DataRoles 561
- dataset caching 23
- datasets
 - actions 55
 - creating programmatically 511
 - definitions 495
 - deleting 55
 - discovering 372
 - Gen2 refreshes 404
 - understanding 52
- Dataverse 220
- DataView object 558
- DataViewMappings 561
- Datazen 12
- Date data type 235
- date tables
 - autogenerated 264
 - creating with Power Query 214
 - importing 183
 - understanding 160
- DATEADD function 278
- DATESBETWEEN function 278
- DATESINPERIOD function 278
- DATESMTD function 278
- DATESQTD function 278
- DATESYTD function 278
- DAX 267, 424
 - functions 274
 - operators 273
 - understanding 267
- DAX Studio 175, 287
- DAXMD 165
- Decimal Number data type 235
- Decision Tree 354
- Decomposition Tree 90, 335
- default aggregation 263
- defaultRetentionPolicy 499
- denormalization 159
- deployment pipelines 23, 408
- descriptive analytics 3
- diagram view 227
- diagrams 253
- dimensions 41, 159
- DirectQuery 165, 424, 425
 - and Tabular 427
 - limitations 437
- DirSync 362
- display folders 264
- distinct count 441
- DISTINCT function 275, 276
- DISTINCTCOUNT function 275
- distribution lists 367

- DIVIDE function 288
- DNS Service 28
- Doughnut Chart 85
- drilldown 77
- drilling across 304
- drilling down 79, 296, 304
- drilling through 60, 112, 129, 145, 305
- drillthrough 58, 79
 - filters 307
 - pages for 306
- drillthrough actions 464
- dual storage 435
- duplicating pages 79
- Duration data type 235
- dynamic data security 449
- Dynamic Management Views 287
- Dynamics CRM 20, 32

E

- EARLIER function 275
- EARLIEST function 275
- Edit Interactions 298
- Editing View 78
- effective identity 545
- EffectiveUserName 456, 472
- embed codes 51, 70, 369
- embed configuration 522
- embed token 544
- embedded capacity 516
- embedding reports 37
- encrypted connections 172, 178
- endorsing datasets 415
- Enter Data 190
- enumerateObjectInstances 562
- error handling 207
- Esri 87
- ETL 41, 42, 192
- Excel
 - connecting to 104
- Excel data types 417
- Excel files
 - importing 64, 184
 - reporting options 109
- Excel reports 68
 - in Power BI Mobile 149
- ExecutionLog 472
- experiments 355
- explain increase/decrease 76, 328
- explicit measures
 - implementing 287
 - introducing 270
- exporting data 76
- external sharing 392
- external tools 175

F

- fact tables 41, 158
- favorites 72, 118, 143
- featured tables 417
- features in ML 345
- fields 158
 - adding to reports 82
 - and icons 81
- Fields pane 81
- Filled Map 87
- FILTER function 275, 276
- filtering data 203
 - in Data View 234
- filters
 - compared to slicers 302
 - hiding 303
 - locking 303
- Filters pane 72
 - Power BI Mobile 149
- Find anomalies 336
- fixed-length files 186
- Flow 37
- focus mode 113, 300
- forecasting 81, 329
- foreign key 161
- Format Painter 172
- formatting columns 236
- Forms Authentication 540
- formula bar
 - in Data View 273
 - in Query Editor 200
- fully-additive measures 260
- Funnel Chart 85

G

- gateway 35, 53, 164
 - comparing 394
 - defined 54
 - installing 395
 - standard vs personal 394
 - using 398
- Gateway Role 29
- Gauge 88
- GDPR 44
- general classification 344
- geo fields 81
- Geo filter 148
- Geoflow 8
- Geography data type 236
- GeoJSON 87
- Get Datasets API 525
- Get Insights 71, 101, 112
- ggplot2 338
- global search 47, 372
- GlobeMap 8, 18
- goal check-in 137

- Goals 50, 132
 - monitoring 136
 - Power BI Desktop 318
 - Power BI Mobile 151
 - securing 136
- Google Analytics 20, 32, 62
- gridlines 78, 174
- grouping data 309
- grouping items 298

H

- HDInsight 12, 53
- hierarchies 260, 262
- high density sampling 331
- HTML5 24
- HTTP verbs 496
- hybrid BI solutions 35
- hybrid tables 438

I

- image areas 317
- images 315
 - in database 316
- implicit measures 270
 - implementing 283
- importing data 53, 164
 - filtering 181
 - from relational databases 180
 - from text files 185
 - from Web 189
- inactive relationships 247, 253
- incremental refresh 226, 430
- individual subscriptions 126, 473
- inference pipeline 356
- in-focus mode 74
- information protection 371
- in-line date hierarchies 261
- Inner Join 209
- interactions 74
- interactive features 20, 75
 - in native apps 147
- interactive highlighting 74
- Internet of Things 36, 473
- iOS 24
- iOS native app 139
- IoT *See* Internet of Things
- iPad 139
- iPhone 139
- IVisual interface 549

J

- JavaScript Object Notation *See* JSON
- JSON 174, 224

K

Kerberos 397
key columns 161
Key Influencers 90, 333
K-Means 331
KPI 88, 131, 187, 290

L

large datasets 23, 379, 426
LASTNONBLANK function 260
Left Outer Join 209
licenses 364
lift chart 350
Line Chart 83
lineage view 61
linguistic schema 173, 321
linked table 223
links 311
live connections 19, 30, 48, 53, 66
locking objects 174
logo 295
lookup tables 159
LOOKUPVALUE function 259, 275, 276, 450

M

M language 37, 194, 198
mail-enabled groups 367
Many-to-Many cardinality 245
many-to-many relationships 259
Map 300
Map Shaper 87
Map visual 299
maps 86
Marketo 20
Master Data Services 12
Matrix visual 86, 98, 299
MAX function 274
MAXX function 274
MDX 187, 424
measures
 implicit vs. explicit 270
 introducing 269
 vs. calculated columns 270
 when to use? 271
memory utilization 413
Microsoft Data Platform 11
Microsoft Store 168
Microsoft Teams 52, 74, 129
Microsoft.Identity.Web 505, 530
MIN function 274
MINX function 274
ML Designer 353
mobile layout 146, 148
mobile reports 150

Model View 252
Model-driven apps 485
MOLAP 424
MSAL 505
Multi Row Card 89
Multidimensional 423
multidimensional cubes 41
Multidimensional Expressions 424
multifactor authentication 364
multi-geo support 23
My Workspace 47, 376

N

naming conventions 232
narratives 321
natural questions 123
navigation 326
navigation links 263
Navigator window 178
Node.js 553
NoSQL 12
Notification center 51

O

OAuth
 for native clients 504
 for web apps 502
 implementing 508
 parties 502
 three-leg flow 502
 understanding 502
OAuth2 37
object-level security 453
ODBC 177
ODS 423
Office 365 8, 44
Office 365 Application Launcher 51
Office 365 groups 366
On premises Gateway 66, 165
 and SSAS 455
 configuring 396
 mapping users 457
OneDrive 54, 65, 104
OneDrive for Business 190
one-to-many cardinality 161
one-to-one cardinality 161
operators 273
Oracle 176
organization visuals 369
organizational apps 21, 48, 143, 372
 rights 388
 understanding 386
organizational BI 3
 challenges 42
 classic architecture 40
 classic solution 422

vs. personal BI 425

outliers 100
overloads 413
OWIN 535

P

Page navigator 326
page render 402, 517
Paginated Report visual 466
paginated reports 23, 69, 125
 downloading 56
 limitations 464
 understanding 461
pandas 342
Parallel Coordinates 332
PARALLELPERIOD function 278
parent-child relationships 257
partner showcase 174
password policy 364
PATH function 258
PATHCONTAINS function 450
PATHITEM function 259
pbviz tool 553
pbix file 18
PDF 71
Performance analyzer 174, 292
Performance inspector 117
persistent filters 57
personal gateway
 configuring 384
personalizing visuals 103
phone layout 174
Phone View 118
Pie Chart 85, 146, 300
pinning report items 472
pinning reports 122
pinning visualizations 122
pipeline 354
Power Apps 91
 introduced 12
Power Apps visual 485
Power Automate 12, 92, 489
 and Goals 137
Power BI
 browser support 138
 data security 30
 design tenets 10
 problems it solves 9
 product line 5
 role in Microsoft BI 13
 signing up 44
Power BI admin 368
Power BI dataflows 224
Power BI Desktop
 availability 168
 compared with Excel 17

- defined 16
- downloading 51
- features 16
- for Power BI Report Server 468
- importing from Excel 18
- introduced 4
- updating 172
- Power BI Developer Center 37, 500
- Power BI editions 51
- Power BI Embedded
 - capacities 410
 - features 25
 - getting started 516
 - introduced 4
 - introduced 4
 - licensing 26
 - playground 522
- Power BI for Office 365 9
- Power BI Free 14
- Power BI Mobile 32
 - defined 24
 - downloading 51
 - features 24
 - introduced 4
- Power BI portal 46
- Power BI Premium
 - Gen2 403
 - introduced 4
 - managing 409
 - notifications 411
 - understanding 22, 400
- Power BI Pro 14
- Power BI Report Server
 - in Power BI Mobile 142
 - introduced 4
 - licensing 467
 - pinning items 125
 - understanding 27, 467
- Power BI Service
 - architecture 28
 - defined 4
- Power BI visuals gallery 564
- Power Map 8
- Power Pivot 6, 17
- Power Platform 12
- Power Query 8, 16, 192
- Power View 7, 17
- Power Virtual Agents 13
- PowerApps 37
 - integrating with Power BI 485
 - understanding 484
- PowerShell 512
- PPU *See* Premium per User
- precision 349
- predictive analytics 3, 328
- predictive experiment 3
- predictive features 3

- predictive solutions 36
- premium capacity 22, 401
- Premium Per User 15, 404
- premium workspaces 405
- prescriptive analytics 3
- preview features 172
- primary key 161, 245
- probability threshold 348
- protecting data 419
- publish to web 70, 371
- publishing content 386
- PubNub 482
- push dataset 474
- Python 8, 90, 195, 342, 373

Q

- Q&A 20, 52, 173, 319
 - disabling 118
 - embedding 525
 - for creating dashboards 60, 123
 - in Power BI Desktop 173
 - Power BI Mobile 144
 - review questions 374
 - tuning 124, 321
 - working with 128
- Q&A Explorer 320
- QR code 70, 114
- quantitative scaling 559
- queries
 - appending 210
 - defined 164
 - disabling load 194
 - disabling refresh 194
 - merging 207
- query caching 407
- query diagnostics 198
- Query Editor 179, 181
 - understanding 192
- query folding 201, 432
- query functions 211
- query log 443
- query parameters 194, 431
 - creating 216
 - dynamic 216
- query reduction 172
- Quick Insights 55, 112, 114
 - adding to dashboard 124
 - in Power BI Desktop 328
 - working with 100
- quick measures 34, 286
- quick styles 86

R

- R 8, 90, 338, 373
 - data shaping with 195
- ranking functions 278

- RANKX function 283
- RDL 462
- Reading View 58, 69
- real-time BI 36, 473
- real-time dashboards 480
- real-time endpoint 356
- real-time tile 483
- recent sources 172, 241
- recents 47, 143
- refresh plan 471
- refresh policy 432
- refreshing data 54, 243
- regression 345
- RELATED function 275, 282
- related insights 115
- RELATEDTABLE function 275, 282
- relationship cardinality 251
- relationships
 - auto-detecting 248
 - auto-discovering 201
 - cardinality 161
 - changing to inactive 253
 - creating in Data View 250
 - creating in Relationships View 254
 - detecting 161
 - introduced 160
 - limitations 245
 - managing 252, 253
 - redundant paths 161
 - rules 245
 - strong and weak 436
 - understanding 244
- relative dates 74
- reply URL 502
- Report Builder 12, 461
- report pages 69
- report snapshot 464
- Report View 169
- Report Viewer control 463
- reporting roadmap 461
- reports
 - actions 57
 - API 500
 - copying 70
 - defined 56
 - distributing 59
 - featured 57
 - importing 58
 - options for creating 58
 - personalizing 58, 103
 - pinning 72
 - printing 70
 - types of 68
 - usage 71
 - working with 95
- ReportServer database 468
- ReportServerTempDB 468

- resharing dashboards 120
- REST 494
- REST APIs 36, 37
 - enabling 373
 - testing 500
- Revolution Analytics 339
- Ribbon Chart 83
- RLS 429
- ROC curve 349
- ROLAP 424
- role membership 446
- role-playing relationships 246, 253
 - implementing 256
- roles
 - creating 447
 - testing 450
- root cause analysis 99
- row context 268
- row labels 321
- row-level security 173, 382, 445, 448
- RStudio 339

S

- Salesforce 20, 32, 225
- SAMEPERIODLASTYEAR 278, 290
- samples 49, 174
- scalability 425
- Scatter Chart 84, 146
- scheduled refresh 385
- Scorecard visual 318
- scorecards 131
- scoring 345
- seasonality 100
- security groups 367
- security policies 451
- See Records 79
- segmentation 331, 334
- SELECTEDVALUE function 218
- Selection pane 174, 324
- self-service BI 1
 - benefits 43
 - cautions 43
 - understanding 40
 - vs. organizational BI 425
- self-service data models 34
- semantic model 423
- semi-additive measures 260
- sensitivity labels 60, 118, 419
- sentiment analysis 195
- SentimentAnalyzer 475
- service principal 540
- service principals 373
- Shape charts 85
- Shape Map 86
- shapes 79
- shared capacity 22, 401
- shared data sources 464
- shared datasets 417
- SharePoint Online 54, 65, 104
- SharePoint Server 7
- sharing
 - items 14, 32
 - options 20
 - with Power BI Mobile 25
- sharing options 390
- show value as 285
- Single Card 89, 297
- Siri shortcuts 145
- Sketch Tool 141
- Slicer 122
- slicers
 - synchronizing 301
 - with dates 300
- small multiples 297
- smart narratives 91
- snapping to grid 78
- Snowflake 372
- snowflake schema 159
- sorting 86
- sorting data
 - in Data View 232
- source control 409
- Spark 30, 53
- sparkline 315, 557
- Spotlight 325
- spreadmarts 43
- SQL Server Data Tools 461
- SQL Server Mobile Report Publisher 473
- SQL Server Profiler 459
- SSO 397
- SSRS 189
 - importing from reports 189
 - KPIs 150
 - limitations for Power BI 472
- Stacked Bar Chart 83, 297
- Stacked Column Chart 83
- star schema 158
- STDEV.P function 275
- STDEV.S function 275
- STDEVX.P function 275
- STDEVX.S function 275
- steady share 100
- stepped layout 304
- storage limits 51
- stored credentials 470
- stored procedures 177
- streaming API 481
- streaming dataflows 474
- streaming dataset 474, 481
- subgoals 133
- subscriptions 21, 71, 101, 117
 - creating 93
- enabling 371
- limitations 94

- SUM function 260, 274
- SUMX function 274, 282, 283
- SVG 37
- Sync slicers 174
- synonyms 124, 254
- Synoptic Panel 317

T

- table columns 232
- table filters 446
- Table visual 86, 299
- tables
 - importing 242
 - renaming 238
 - understanding 231
- Tabular 423
 - role in Power BI 30
- Tabular Editor 409
- Tabular models 41
- team BI 2, 35
- template apps 20, 62, 372, 373, 374
- templates 170
- tenant 46
- tenant settings 370
- text boxes 79
- Text data type 235
- themes 173
- tile flow 60, 111
- tiles
 - refreshing 118
 - understanding 111
 - working with 127
- Time data type 235
- time dimension 262
- time intelligence functions 277
- time series forecasting 330, 339
- time series insights 100
- tooltip page 308
- tooltips 75, 307
 - custom visuals 562
- top N filtering 73
- TopoJSON 87
- TOTALYTD function 289
- transactional reports 41
- transforming data 202
- Treemap 85, 99
- TRUE/FALSE data type 235
- Twitter 475
- type definitions 554
- TypeScript 37, 550

U

- Universal Principal Name 457
- unknown member 251

unmanaged tenant 362
unpivoting columns 204
URL 116
usage metrics 118, 369
User Owns Data 528
USERRELATIONSHIP 257, 275
USERNAME function 449
USERPRINCIPALNAME 394, 449

V

VALUES function 275
VAR.P function 275
VAR.S function 275
VARX.P function 275
VARX.S function 275
v-cores 401
VertiPaq 164
Viewer role 381
viewers 406
Visio diagrams 317
visual header 57, 74

visual Interactions 79
VisualInitOptions 558
visualizations
 best practices 83
 copying 371
 formatting 81
 types of 83
Visualizations pane 80

W

web application proxy 472
Web URL 315
Web URL category 312
WebGL 37
whoami 457
Whole Number data type 235
Windows credentials 178
Windows native app 140
workloads 411
workspaces 47
 and Power BI Embedded 519

block creation 371
bulk assignments 413
comparing v1 and v2 378
creating 379
for Power BI Embedded 520
individual assignments 414
introduced 20
limitations 378
list of 370
moving to capacity 413
 understanding 376
writeback 485

X

XMLA endpoint 23, 434
xVelocity 7, 164, 423

Y

YTD calculations 289