

Section	Subject	Page	
One	PHP Introduction	2	
	– PHP: Hypertext Preprocessor	3	
	– Some of its main uses	4	
Two	PHP Structure	5	
	– Basic Structure of PHP	6	
	– PHP Version etc	15	
	– Use of Echo	17	
	– Concatenating Echo	19	
	– Use of Echo with Escape Characters	21	
	– Use of Echo with Calculations	27	
	– Echo versus Print	30	
	– Use of Echo with HTML 	32	
	– Commenting code in PHP	34	
	Three	Defining PHP Variables	37
		– Introduction	38
– Defining PHP Variables		39	
– Naming PHP Variables		40	
– Declaring PHP Variables		43	
– Flexibility of Datatypes		45	
– Casting Datatypes		46	
– Using gettype() with PHP Variables		50	
– Using var_dump() with PHP Variables		52	
– Using settype() with PHP Variables		53	
– Using unset() with PHP Variables		55	
– Using Heredoc		56	
– Using Nowdoc		58	
– Using Define for Constants in PHP		59	
Four	Manipulating Variables in PHP	61	
	– Introduction	62	
	– Mathematics	63	
	– Incrementing Values	67	
	– Prefix and Postfix	69	
	– Concatenation	72	
	– <i>Exercise One</i>	76	
	Five	Using PHP built in String Functions	81
– Introduction		82	
– Miscellaneous String Functions		84	
– Changing Case of Strings		89	
– Substringing Strings		90	
– Searching Strings		92	
– Trimming Strings		98	
Six	Using PHP built in Number Functions	100	
	– Introduction	101	
	– Number Rounding	102	
	– <i>Exercise Two</i>	106	
Seven	Introduction to PHP Arrays	109	
	– Introduction	110	
	– Numeric Arrays	112	
	– Populating Numeric Arrays	113	
	– Populating Numeric Arrays with range()	116	
	– Populating Numeric Arrays with array_pad()	119	
	– Populating Associative Arrays	121	
	– Using count() or sizeof()	127	
	– Using var_dump()	128	
	– Using print_r()	130	

Section	Subject	Page
	- Manually traversing Arrays	131
	- Converting Arrays	133
	- Using implode() and explode()	134
	- Using unset()	136
	- Multi-Dimensional Arrays	137
	- Using var_dump() on multi-dimension arrays	140
	- Using count() on multi-dimension arrays	143
	- Three dimensional arrays	144
	- Accessing Three Dimensional Arrays	146
	- Alternative declaration of Arrays	147
	- <i>Exercise Three</i>	148
Eight	Using Array Functions	154
	- Introduction	155
	- Using array_sum() / array_product()	156
	- Sorting Arrays	157
	- assort() and arsort()	163
	- ksort() and krsort()	164
	- array_multisort()	165
	- array_reverse()	169
	- array_flip()	170
	- array_fill() and array_fill_keys()	172
	- array_combine()	176
	- array_intersect()	177
	- array_diff()	178
	- array_merge()	179
	- array_unique()	180
	- <i>Exercise Four</i>	181
Nine	Conditional PHP Statements	185
	- Conditional tests	186
	- Comparison Operators	187
	- If statement structure	189
	- Grouping processes in an 'If' statement	191
	- Alternative processing	193
	- Multiple 'If' statements	194
	- Testing different datatypes	198
	- Testing Strings	200
	- Testing Booleans	204
	- Testing for nulls	206
	- Alternative Colon syntax	207
	- Multiple Condition tests (and)	209
	- Multiple Condition tests (or)	210
	- Multiple Condition tests (xor)	211
	- Nested If Conditions	212
	- Ternary Operator	213
	- Using PHP built in Functions for testing	216
	- <i>Exercise Five</i>	218
Ten	Using Switch in Condition Testing	221
	- Introduction	222
	- The Switch Syntax	223
	- Using Break with Switch	225
	- Using Default with Switch	227
	- Using Switch with Colon Syntax	228

PHP 7.4 and MariaDB 10

Section	Subject	Page
	– Advanced Switch Testing	229
	– Mixing If Conditions with Switch	232
	– <i>Exercise Six</i>	234
Eleven	Looping through values in PHP	236
	– Introduction	237
	– Foreach processing of Arrays	238
	– Foreach processing with Colon syntax	242
	– Multidimensional Arrays with Foreach	243
	– While Loops	245
	– While Loops with Colon Syntax	247
	– Using Break to exit Loops	248
	– Do .. While Loops	249
	– Do .. While and While Loops with Arrays	251
	– For Loops	252
	– For Loops with Colon Syntax	254
	– For Loops with empty expressions	255
	– For Loops with more than one variable	257
	– For Loops with Arrays	258
	– Advanced Breaking of Loops	260
	– Using Continue with Loops	267
	– <i>Exercise Seven</i>	270
Twelve	Using Dates within PHP	274
	– Introduction	275
	– Creating String of Dates	276
	– Converting Strings to Dates using strtotime()	277
	– Limitation of using strtotime()	284
	– Using Format Masks with date()	285
	– Comparing Dates	287
	– Adding to Dates	288
	– Using mktime()	289
	– Using getdate()	290
	– Other Date Functions	291
	– <i>Exercise Eight</i>	292
Thirteen	Regular Expressions using PCRE	294
	– Introduction	295
	– Testing for 'Contains' within a String	297
	– Starts or Ends using Line Anchors	298
	– Starts and Ends using Line Anchors (or)	300
	– Using the Dot (Any Character)	301
	– Using {Intervals}	303
	– Using Character Lists []	305
	– Using Character Lists to exclude matches	308
	– Using Escape Sequences	309
	– Using the Question Mark (Optional)	311
	– Using the Plus sign (Mandatory)	313
	– Using the Star sign (Optional)	314
	– Backreferencing	315
	– POSIX	317
	– Using preg_replace()	319
	– Using preg_replace() with arrays	321
	– Using preg_filter()	323

PHP 7.4 and MariaDB 10

Section	Subject	Page
	– Using preg_replace_callback()	324
	– Using preg_match()	325
	– Preg_match() with PREG_OFFSET_CAPTURE	326
	– Using preg_match_all()	327
	– Using preg_grep()	329
	– Using preg_last_error()	331
	– Using preg_quote()	332
	– Using preg_split()	333
	– Using preg_split() with arrays	335
	– <i>Exercise Nine</i>	336
Fourteen	PHP Functions	339
	– Introduction	340
	– Rudimentary Functions	341
	– Function Positioning	343
	– Passing Parameters to Functions	344
	– Passing Multiple Parameters to Functions	346
	– Defaulting Parameters in Functions	347
	– Returning Values	348
	– Returning Values in an Array	350
	– The scope of Variables	351
	– Global Variables	353
	– Passing Arguments by Reference	354
	– Dynamic Function Calls	355
	– Calling Functions from other Functions	358
	– Calling PHP Functions in other files	359
	– Structure of the PHP file	360
	– Calling the PHP file	361
	– Calling the PHP file using include()	362
	– Passing Parameters to another PHP file	365
	– <i>Exercise Ten</i>	366
Fifteen	PHP Cookies	369
	– Introduction	370
	– Creating Cookies in PHP with setcookie()	371
	– Setting the expiry date for Cookies	373
	– Setting the path for Cookies	375
	– Setting the domain/security for Cookies	376
	– Reading Cookies with \$_COOKIE	377
	– Using Arrays with Cookies	379
Sixteen	PHP Sessions	380
	– Introduction	381
	– Creating Sessions	382
	– Testing Sessions	383
	– Using Arrays with Sessions	384
	– Deleting Sessions	385
Seventeen	PHP Form Processor	386
	– Introduction	387
	– Anatomy of a HTML form	389
	– Reading input using \$_POST/\$_GET	392
	– Reading input using \$_POST	393
	– Reading input using \$_GET	394
	– \$_GET versus \$_POST	395

Section	Subject	Page
	- Using \$_REQUEST	396
	- Using \$_SERVER	397
	- Preventing Invalid HTML in Forms	401
	- Emailing in PHP	402
	- Emailing HTML in PHP	404
	- Emailing with attachments in PHP	406
	- <i>Exercise Eleven</i>	407
Eighteen	PHP Errors	410
	- Introduction	411
	- Typical Errors	412
	- Suppressing Errors	414
	- \$php_errormsg	417
	- Using die to end the processing	419
	- Using exit to end the processing	420
	- Using isset() \$php_errormsg	421
	- Alternative way to use \$php_errormsg	422
	- Using error_reporting()	423
	- Using error_reporting() report levels	426
	- Custom error handling	428
	- Raising Errors using trigger_error()	432
	- Using error_log	434
	- Using a centralised error handler	437
Nineteen	Exceptions	439
	- Introduction	440
	- Exception Syntax	441
	- The 'try'	442
	- The 'throw'	443
	- The 'catch'	444
	- Standard Exceptions	445
	- Developer Defined Exceptions	448
	- Processing the Exceptions	449
	- Exception Methods	450
	- set_exception_handler()	452
	- Re-throwing Exceptions	454
	- Finally	455
	- <i>Exercise Twelve</i>	457
Twenty	PHP File I/O	459
	- Introduction	460
	- Using fopen()	461
	- Access Modes	462
	- Using fgets()	464
	- Using fgetc()	467
	- Using file()	468
	- Using file_get_contents()	469
	- Using fopen() with URLs	471
	- Using fputs() / fwrite()	472
	- Using file_put_contents()	474
	- Working with Comma Separated Files (CSV)	477
	- Using fgetcsv()	479
	- Using fputcsv()	481
	- Working with Binary Files	483

PHP 7.4 and MariaDB 10

Section	Subject	Page
	- Checking the Size of Bytes written	486
	- Operating System Functions	487
	- Using exec()	489
Twenty One	Creating HTML with PHP	491
	- Introduction	492
	- Why use PHP	493
	- HTML example	494
	- PHP simulating the HTML example	496
	- Using PHP to create dynamic HTML	500
	- Using htmlspecialchars()	507
Twenty Two	PHP Object Orientated Programming	508
	- Introduction	509
	- Terminology	510
	- Instances	511
	- Extending Classes	513
	- Using '\$this'	515
	- Private and Public Methods	517
	- Creating new Classes	518
	- Referencing via Variables	520
	- <i>Exercise Thirteen</i>	521
MariaDB 10		1
One	Introduction to MariaDB	2
	- What is SQL used for ?	3
	- Why use MariaDB with PHP ?	4
	- Definition of a Database	5
	- Using MariaDB with PHP	6
Two	Simple MariaDB Queries in PHP	8
	- Introduction	9
	- Show Tables	10
	- Show Columns	14
	- Describe	17
	- Selecting Data from a Table	18
	- Counting records in a Table	21
	- Selecting Data from a Table	23
	- Selecting Columns from a Table	24
	- Selecting Literals from a Table	25
	- Selecting Literals from Dual	26
	- <i>Exercise One</i>	27
	- Manipulation with Functions	29
	- Concatenating Columns	33
	- Performing Calculations	34
	- Using Variables	35
	- Using mysqli_fetch_array()	37
	- Using Aliases	38
	- Ordering Data	41
	- Ordering more than One Column	43
	- Manipulating Dates using date_add()	44
	- Displaying Dates using date_format()	46
	- <i>Exercise Two</i>	48
Three	MariaDB Errors	56
	- Determining Errors in the SQL	57
	- Using mysqli_errno() and mysqli_error()	58

PHP 7.4 and MariaDB 10

Section	Subject	Page
Four	Limiting Data Selected with a Where Clause	59
	– Limiting Data	60
	– Different types of MariaDB Where Clauses	62
	– Using Table Aliases	73
	– Combining Where Clauses	75
	– Different types of MariaDB Where Clauses	76
	– Handling Nulls in Where Clauses	77
	– Using Functions in Where Clauses	78
	– Using PHP Variables in Where Clauses	80
	– <i>Exercise Three</i>	81
Five	Aggregating Values	85
	– Introduction	86
	– Using Group By	88
	– Using Having with Group By	90
	– Using With Rollup to Total Grouping	91
	– Using Distinct()	92
Six	Regular Expressions	96
	– Introduction	97
	– Testing for 'Contains' within a String	98
	– Starts or Ends using Line Anchors	99
	– Starts and Ends using Line Anchors (or)	100
	– Using the Dot (Any Character)	101
	– Using {Intervals}	102
	– Using Character Lists []	104
	– Using Character Lists to exclude matches	107
	– POSIX	108
	– Using the Question Mark (Optional)	110
	– Using the Plus sign (Mandatory)	112
	– Using the Star sign (Optional)	113
	– <i>Exercise Five</i>	114
	Seven	Joining Tables in a MariaDB Statement
– Introduction		117
– Linking Tables in a MariaDB Statement		118
– Theta style of SQL		123
– ANSI style of SQL		124
– Problems with Data matching		125
– Problems with Joining Tables in SQL		126
– Ansi SQL Standards (Natural Joins)		127
– Ansi SQL Standards (Cross Joins)		128
– Ansi SQL Standards (Joins/Using)		129
– Ansi SQL Standards (On)		130
– Ansi SQL Standards (Multiple On)		131
– Ansi SQL Standards (Left Outer Joins)		132
– Ansi SQL Standards (Right Outer Joins)		133
– Merging Tables		134
– Using Union to Merge Tables	135	
– Using Union All to Merge Tables	136	
– Using Intersect to Merge Tables	137	
– Using Minus to Merge Tables	138	
– Knowledge Check	139	

Section	Subject	Page
	– Knowledge Check - Union	140
	– Union Syntax	141
	– Knowledge Check – Union All	142
	– Union All Syntax	143
	– Knowledge Check - Intersect	144
	– Intersect Syntax	145
	– Knowledge Check - Minus	146
	– Minus Syntax	147
	– Using the Merge Syntax	148
	– <i>Exercise Six</i>	149
Eight	Advanced MariaDB Query Techniques	154
	– Using Limit	155
	– Using If()	157
	– Using Ifnull()	158
	– Using Nullif	159
	– Using Case Function	160
	– Using Sub-queries	164
	– Using Set to create variables	167
	– Populating a Variable from a Query	168
	– <i>Exercise Seven</i>	170
Nine	MariaDB Datatypes	173
	– Introduction	174
	– Numeric Datatypes (Integer)	175
	– Numeric Datatypes (Decimal)	176
	– String Text Datatypes	177
	– String Blob Datatypes	178
	– String List Datatypes	179
	– Date Datatypes	180
Ten	Creating Database Objects	181
	– Creating Tables	182
	– Mandatory Columns	183
	– Creation Syntax for Tables	184
	– Column Creation	187
	– AUTO_INCREMENT	189
	– Last_insert_id	190
	– Drop Table Syntax	191
	– Temporary Tables	192
	– Creating Indexes	194
	– Primary Key Creation	197
	– Unique Key Creation	200
	– Foreign Key Creation	203
	– On Delete / On Update	205
	– Cascade	208
	– Set Null	209
	– NO ACTION	210
	– RESTRICT	211
	– SET DEFAULT	212
	– Creating Views	213
	– Renaming Views	216
	– Dropping Views	217
	– <i>Exercise Eight</i>	218

Section	Subject	Page
Eleven	Altering Elements	220
	– Altering Tables	221
Twelve	Inserting and Altering Data	224
	– Rules	225
	– Syntax for Populating Tables	226
	– Inserting using the Set syntax	232
	– Multiple Inserts	233
	– On Duplicate Key Update	234
	– Using Replace for Inserting Records	235
	– General Comments	238
	– Updating Records Rules	239
	– Updating Data	240
	– Deleting Data	243
	– Truncate	244
	– Inserting Large Objects	245
	– Views	247
Thirteen	Prepared Statements	251
	– Introduction	252
	– Preparing the Statement	253
	– Removing Prepared Statements	254
	– Using Parameters	255
	– Using mysqli_prepare()	257
	– Using mysqli_stmt_bind_param()	258
Fourteen	Committing Records	259
	– DDL and DML	260
	– mysqli_commit() and mysqli_rollback()	262
	– What happens if disconnected ?	264
	– <i>Exercise Nine</i>	265
Fifteen	Importing and Exporting	271
	– Outfile	272
	– Problems with Outfile	276
	– Using Dumpfile	278
	– Selecting into Variables	279
	– Importing Data using Infile	280
	– Ignoring Lines using Infile	282
	– Using the Set command with Infile	283
	– Using the Lines option with Infile	286
	– Loading comma separated files	287
	– Loading XML file	289
	– Loading XML file using Ignore	291
	– Loading XML file naming Columns	292
	– Loading XML file using Set	293
Sixteen	Using XML with PHP	294
	– Introduction	295
	– Reading XML files with PHP with DOM	296
	– Reading XML with getElementByTagName()	304
	– Looping with getElementByTagName()	306
	– Writing XML files with PHP	315
	– Writing XML files with PHP Arrays	320
	– Writing XML files with PHP from MariaDB	326
	– <i>Exercise Ten</i>	331