

Chapter 10

How to work with dates

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7, 6, 5, 4, 3, 2, 1, 0

Common format codes for the date() function

Character	Description
D	Day of week – three letters
l	Day of week – full name
n	Month – no leading zero
m	Month – leading zero
M	Month – three letters
F	Month – full name
j	Day of month – no leading zero
d	Day of month – leading zero
Y	Year – four digits
L	Leap year (1) or not (0)

Objectives

Applied

- Use any of the functions, methods, and techniques presented in this chapter to work with dates, timestamps, and date intervals.

Knowledge

- Describe a timestamp.
- Describe the Y2K38 problem, and explain how the use of DateTime objects solves this problem.
- Describe the use of the PHP functions for working with timestamps.
- Describe the use of the DateTime and DateTimeInterval objects.

Common format codes for the date() function (continued)

Character	Description
g	Hours – 12-hour format, no leading zero
h	Hours – 24-hour format, no leading zero
G	Hours – 12-hour format, leading zero
H	Hours – 24-hour format, leading zero
i	Minutes – leading zero
s	Seconds – leading zero
a	am/pm – lowercase
A	AM/PM – uppercase
T	Time zone abbreviation
U	Seconds since Unix epoch

The date() function

```
date($format[, $ts])
```

How to format a timestamp

```
$date1 = date('n/j/Y'); // 8/11/2017
$date2 = date('Y-m-d'); // 2017-08-11
$date3 = date('l, F d, Y'); // Friday, August 11, 2017
$date4 = date('g:i a'); // 3:11 pm
$date5 = date('H:i:s'); // 15:11:11
$date6 = date('Y-m-d \a\t H:i:s'); // 2017-08-11 at 15:11:11
$date7 = date('Y-m-d', 1521068400); // 2018-03-15
```

Key terms

- Timestamp
- Unix epoch



How to get the parts of a timestamp

```

$expires = mktime(13, 30, 0, 3, 15, 2018);
$parts = getdate($expires);
$year   = $parts['year'];      // 2018
$mon    = $parts['mon'];      // Month number - 3
$month  = $parts['month'];    // Month name - 'March'
$mday   = $parts['mday'];     // Day of month - 15
$weekday = $parts['weekday']; // Weekday - 'Thursday'
$wday   = $parts['wday'];     // Weekday as number - 4
$hours  = $parts['hours'];    // Hours - 13
$minutes = $parts['minutes']; // Minutes - 30
$seconds = $parts['seconds']; // Seconds - 0

```



URL for a list of all PHP timestamp functions

<http://www.php.net/manual/en/ref.datetime.php>

Functions for working with timestamps

```

time()
mktime([ $h[, $m[, $s[, $M[, $D[, $Y]]]]])
checkdate($M, $D, $Y)
getdate([ $ts])

```

How to create a timestamp

```

$now = time();
$expires = mktime(13, 30, 0, 3, 15, 2018);
$expires = mktime(13, 30, 0, 3, 15);
$expires = mktime(13, 30, 0, 3);

```



The strtotime() function

```
strtotime($str[, $ts])
```

Types of templates used in strtotime()

- Absolute
- Relative



How to validate a date

```
$valid_date = checkdate(11, 31, 2017);
```

How to validate a time

A custom function for validating a time

```

function checktime($h, $m, $s) {
    return $h >= 0 && $h < 24 && $m >= 0 && $m < 60
        && $s >= 0 && $s < 60;
}

```

A statement that calls the custom function

```
$valid_time = checktime(12, 30, 0);
```



Generating a timestamp with an absolute template

```

// Current time of Fri 08/11/2017 3:38:00 pm
$date1 = strtotime('2018-06-01'); // Fri 06/01/2018 00:00
$date2 = strtotime('6/1/2018');  // Fri 06/01/2018 00:00
$date3 = strtotime('Jun 1');     // Thu 06/01/2017 00:00
$date4 = strtotime('8:45');      // Fri 08/11/2017 08:45
$date5 = strtotime('8am');       // Fri 08/11/2017 08:00
$date6 = strtotime('2016-02-29 8:45am'); // Tue 03/01/2016 08:45

```



Generating a timestamp with a relative template

```
// Current time of Fri 08/11/2017 3:38:00 pm
$date1 = strtotime('+1 hour'); // Fri 08/11/2017 16:38
$date2 = strtotime('-2 days'); // Wed 08/09/2017 15:38
$date3 = strtotime('tomorrow'); // Sat 08/12/2017 00:00
$date4 = strtotime('tomorrow 10:15am');
// Sat 08/12/2017 10:15
$date5 = strtotime('next sunday');
// Sun 08/13/2017 00:00
$date6 = strtotime('last day of');
// Thu 08/31/2017 15:38
$date7 = strtotime('first day of next month');
// Fri 09/01/2017 15:38
$date8 = strtotime('third wednesday of');
// Wed 08/16/2017 00:00
$date9 = strtotime('nov second thu of 8am');
// Thu 11/11/2017 08:00
```

Determining if a year is a leap year

```
function is_leapyear($ts) {
    return (date('L', $ts) == '1');
}
$year_2016 = is_leapyear(strtotime('2016-1-1'));
$year_2018 = is_leapyear(strtotime('2018-1-1'));
```

Displaying a message about an expiration date

```
$now = time();
$exp = strtotime('2018-4 first day of next month midnight');
if ($exp < $now) {
    echo 'Your card has expired.';
} else {
    echo 'Your card has not expired.';
}
```

How to modify a timestamp

```
$checkout = mktime(13, 30, 0, 9, 8, 2017);
$due_date = strtotime('+3 weeks 6pm', $checkout);
```

Displaying a message about an expiration date

```
$now = time();
$exp = '04/2018'; // Typical expiration date format

// Change exp format from mm/yyyy to yyyy-mm
$month = substr($exp, 0, 2);
$year = substr($exp, 3, 4);
$exp = $year . '-' . $month;

// Set exp date; calculate number of days from current date
$exp = strtotime($exp . ' first day of next month midnight');
$days = floor(($exp - $now) / 86400); //864000 seconds/day

// Display a message
if ($days < 0) {
    echo 'Your card expired ' . abs($days) . ' days ago.';
} else if ($days > 0) {
    echo 'Your card expires in ' . $days . ' days.';
} else {
    echo 'Your card expires at midnight.';
}
```

Key terms

- Absolute template
- Relative template

Displaying a countdown until the New Year

```
$now = time();
$new_year = strtotime('next year Jan 1st', $now);

// Calculate the days, hours, minutes, and seconds
$seconds = $new_year - $now;
$days = floor($seconds / 86400);
$seconds -= $days * 86400;
$hours = floor($seconds / 3600);
$seconds -= $hours * 3600;
$minutes = floor($seconds / 60);
$seconds -= $minutes * 60;

// Display the countdown
echo "$days days and $hours:$minutes:$seconds to New Year's.";
```

How to create a DateTime object

Using the current date and time

```
$now = new DateTime();
```

Using a strtotime() format string

```
$expires = new DateTime('2018-03-15 13:30:00');
$tomorrow = new DateTime('+1 day');
$due_date = new DateTime('+3 weeks');
$appointment = new DateTime('next Friday +1 week 13:30');
```

How to create a DateInterval object

```
$interval = new DateInterval('P30D');
```

The parts of the interval string

Part	Description
P	Begins the interval code
NY	Specifies the number of years
nM	Specifies the number of months
nW	Specifies the number of weeks
nD	Specifies the number of days
T	Starts the time portion of the interval code
nH	Specifies the number of hours
nM	Specifies the number of minutes
nS	Specifies the number of seconds

Methods of a DateTime object

```
format($format)
setTime($h, $m, $s)
setDate($y, $m, $d)
modify($str)
getTimestamp()
setTimestamp($ts)
```

How to use interval strings

```
$interval_1 = new DateInterval('P1Y2M10D');
$interval_2 = new DateInterval('PT1H2M3S');
$interval_3 = new DateInterval('P1Y2M10DT1H2M3S');
```

The format() method of a DateInterval object

```
format($format)
```

How to use the methods of a DateTime object

How to copy a DateTime object

```
$invoice_date = new DateTime('2017-09-15 13:30:00');
$due_date = clone $invoice_date;
```

How to set the time and date of a DateTime object

```
$due_date->setTime(22, 30, 0);
$due_date->setDate(2017, 9, 15);
```

How to modify a DateTime object

```
$due_date->modify('+3 weeks');
```

How to display a DateTime object

```
echo 'Payment Due: ' .
    $due_date->format('M. j, Y \a\t g:i a');
```

How to convert a timestamp to a DateTime object

```
$tomorrow = strtotime('tomorrow 8am');
$nextday = new DateTime();
$nextday->setTimestamp($tomorrow);
```

Format codes for the DateInterval format() method

Code	Description
%R	Sign of the interval (+ or -)
%y	Years
%m	Months
%d	Days
%h	Hours
%i	Minutes
%s	Seconds

How to display a date interval

```
echo $interval_1->format('%m months, %d days');
echo $interval_1->format('%R %M months');
echo $interval_1->format('%R %y %m %d %h %i %s');
echo $interval_1->format('%R%yy %mm %dd %H:%I:%S');
```

Methods of a DateTime object that use DateInterval objects

```
add($interval)
sub($interval)
diff($date)
```



Determining if a year is a leap year

```
function is_leap($date) {
    return ($date->format('L') == '1');
}
$year_2016 = is_leap(new DateTime('2016-1-1'));
$year_2018 = is_leap(new DateTime('2018-1-1'));
```

Displaying a message about an expiration date

```
$now = new DateTime();
$exp = new DateTime(
    '2018-4 first day of next month midnight');
if ($exp < $now) {
    echo 'Your card has expired.';
} else {
    echo 'Your card has not expired.';
}
```



Adding a DateInterval object to a DateTime object

```
$checkout_length = new DateInterval('P3W');
$due_date = new DateTime();
$due_date->add($checkout_length);
```

Subtracting a DateInterval object from a DateTime object

```
$voting_age = new DateInterval('P18Y');
$dob = new DateTime();
$dob->sub($voting_age);
echo 'You can vote if you were born on or before ' .
    $dob->format('n/j/Y');
```



Displaying a message about an expiration date

```
$now = new DateTime();
$exp = '04/2018';

$month = substr($exp, 0, 2);
$year = substr($exp, 3, 4);
$exp = $year . '-' . $month;

$exp = new DateTime($exp .
    ' first day of next month midnight');
$span = $now->diff($exp);

// Display a message
$span_text = $span->format(
    '%y years, %m months, and %d days');
if ($span->format('%R') == '-') {
    echo 'Your card expired ' . $span_text . ' ago.';
} else {
    echo 'Your card expires in ' . $span_text . '.';
}
```



How to determine the time between two dates

```
$now = new DateTime('2017-05-15 12:45:00');
$due = new DateTime('2017-04 last day of midnight');
$time_span = $now->diff($due);
echo $time_span->format('%R%dd %H:%I:%Sh');
```



Displaying a countdown until the New Year

```
$now = new DateTime();
$new_year = new DateTime('next year Jan 1st');

// Calculate and format the time left until the new year
$span = $now->diff($new_year);
$md_left = $span->format('%m months, %d days');
$hms_left = $span->format('%h:%i:%S');

// Display a message
if ($now->format('MD') == '0101') {
    echo 'Happy New Year!';
} else if ($now->format('MD') == '1231') {
    echo '$hms_left remaining to the New Year.';
} else {
    echo "$md_left, and $hms_left remaining to the New Year.";
}
```

