**DateConverter Class**

**Description**

The DateConverter class provides methods to convert dates between the Nepali Bikram Sambat (BS) calendar and the Gregorian calendar (AD). It includes utility functions for validating dates and formatting the output.

**Methods**

**1. GetDateInBS(int year, int month, int day, DateFormats date\_format = 0)**

Converts a Gregorian date to a Bikram Sambat date.

**Parameters:**

* year: The Gregorian year.
* month: The Gregorian month.
* day: The Gregorian day.
* date\_format (optional): The desired format for the output date.

**Returns:** A NepaliDate object representing the Bikram Sambat date.

**2. GetDateInBS(DateTime dateInAD, DateFormats date\_format = 0)**

Converts a Gregorian date to a Bikram Sambat date.

**Parameters:**

* dateInAD: The Gregorian date.
* date\_format (optional): The desired format for the output date.

**Returns:** A NepaliDate object representing the Bikram Sambat date.

**3. GetDateInAD(int bsYear, int bsMonth, int bsDay, DateFormats date\_format = 0)**

Converts a Bikram Sambat date to a Gregorian date.

**Parameters:**

* bsYear: The Bikram Sambat year.
* bsMonth: The Bikram Sambat month.
* bsDay: The Bikram Sambat day.
* date\_format (optional): The desired format for the output date.

**Returns:** An EnglishDate object representing the Gregorian date.

**4. GetDateInAD(string dateInBS, DateFormats date\_format = 0)**

Converts a Bikram Sambat date string to a Gregorian date.

**Parameters:**

* dateInBS: The Bikram Sambat date string.
* date\_format (optional): The desired format for the output date.

**Returns:** An EnglishDate object representing the Gregorian date.

**5. IsValidDate(int year, int month, int day)**

Validates if the provided Gregorian date is valid.

**Parameters:**

* year: The year to validate.
* month: The month to validate.
* day: The day to validate.

**Returns:** A boolean indicating if the date is valid.

**Supporting Classes**

**NepaliDate Class**

Represents a date in the Bikram Sambat calendar with properties for day, month, year, formatted date, and other metadata.

**EnglishDate Class**

Represents a date in the Gregorian calendar with properties for day, month, year, formatted date, and other metadata.

### 

### Example Usage

csharp

Copy code

// Convert AD date to BS date

var dateInBS = DateConverter.GetDateInBS(2024, 7, 2, DateFormats.yMd);

Console.WriteLine($"Date in BS: {dateInBS.FormattedDate}");

// Convert BS date to AD date

var dateInAD = DateConverter.GetDateInAD(2081, 8, 32, DateFormats.yMd);

Console.WriteLine($"Date in AD: {dateInAD.FormattedDate}");

This class provides a comprehensive solution for converting dates between the Gregorian and Bikram Sambat calendars, accommodating various date formats and validating input dates.

## Calendar Class

### Description

The Calendar class provides utility methods for handling various date-related operations, including checking for leap years, getting names of days and months in both English and Nepali, and validating dates.

### Methods

#### 1. IsLeapYear(int englishYear)

Determines if a given year is a leap year.

**Parameters:**

* englishYear: The year to check.

**Returns:**

* true if the year is a leap year, otherwise false.

#### 2. GetDayOfWeek(int weekDayNumber)

Gets the name of the day of the week for a given day number.

**Parameters:**

* weekDayNumber: The number representing the day of the week (0 for Sunday, 1 for Monday, ..., 6 for Saturday).

**Returns:**

* The name of the day of the week.

**Exceptions:**

* ArgumentException if the week day number is not between 0 and 6.

#### 3. GetEnglishMonth(int monthNumber)

Gets the name of the English month for a given month number.

**Parameters:**

* monthNumber: The number representing the month (1 for January, ..., 12 for December).

**Returns:**

* The name of the English month.

**Exceptions:**

* ArgumentException if the month number is not between 1 and 12.

#### 4. GetNepaliMonthInNepaliFont(int monthNumber)

Gets the name of the Nepali month for a given month number in Nepali font.

**Parameters:**

* monthNumber: The number representing the month (1 for Baisakh, ..., 12 for Chaitra).

**Returns:**

* The name of the Nepali month in Nepali font.

**Exceptions:**

* ArgumentException if the month number is not between 1 and 12.

#### 5. ValidEnglishDate(int year, int month, int day)

Validates if a given English (Gregorian) date is valid.

**Parameters:**

* year: The year to validate.
* month: The month to validate.
* day: The day to validate.

**Returns:**

* true if the date is valid, otherwise false.

#### 6. ValidNepaliDate(int year, int month, int day)

Validates if a given Nepali (Bikram Sambat) date is valid.

**Parameters:**

* year: The Nepali year to validate.
* month: The Nepali month to validate.
* day: The Nepali day to validate.

**Returns:**

* true if the date is valid, otherwise false.

### Example Usage

csharp

Copy code

// Check if a year is a leap year

bool isLeap = Calendar.IsLeapYear(2024);

Console.WriteLine($"Is 2024 a leap year? {isLeap}");

// Get the name of the day of the week

string dayName = Calendar.GetDayOfWeek(3);

Console.WriteLine($"The name of day 3 is {dayName}");

// Get the name of the English month

string monthName = Calendar.GetEnglishMonth(7);

Console.WriteLine($"The name of month 7 is {monthName}");

// Get the name of the Nepali month in Nepali font

string nepaliMonth = Calendar.GetNepaliMonthInNepaliFont(5);

Console.WriteLine($"The name of Nepali month 5 is {nepaliMonth}");

// Validate an English date

bool isValidEnglishDate = Calendar.ValidEnglishDate(2024, 2, 29);

Console.WriteLine($"Is the date 2024-02-29 valid? {isValidEnglishDate}");

// Validate a Nepali date

bool isValidNepaliDate = Calendar.ValidNepaliDate(2081, 8, 32);

Console.WriteLine($"Is the Nepali date 2081-08-32 valid? {isValidNepaliDate}");

This class provides useful functions for date manipulations, including leap year checks, day and month name retrieval, and date validation for both Gregorian and Nepali calendars.

## TimeConverter Class

### Description

The TimeConverter class provides methods for converting dates and times between the English (Gregorian) calendar and the Nepali (Bikram Sambat) calendar. It also includes methods for converting between UTC time and Nepali time.

### Fields

#### 1. bsDaysInMonth

An array representing the total number of days in each month of the Bikram Sambat (BS) calendar. This array is used to assist in date calculations.

#### 2. baseEnglishDate

A DateTime object representing the base date in the English calendar for conversion purposes.

#### 3. baseNepaliDate

A DateTime object representing the base date in the Nepali calendar for conversion purposes.

#### 4. nepalTimeOffset

A TimeSpan object representing the time offset of Nepal Standard Time from UTC (+5:45 hours).

### Methods

#### 1. ConvertToNepaliDateTime(DateTime englishDateTime)

Converts an English date and time to Nepali date and time.

**Parameters:**

* englishDateTime: The English date and time to convert.

**Returns:**

* A tuple containing the Nepali date and time components: year, month, day, hour, minute, and second.

**Example Usage:**

csharp

Copy code

var nepaliDateTime = TimeConverter.ConvertToNepaliDateTime(new DateTime(2024, 7, 12, 15, 30, 0));

Console.WriteLine($"Nepali Date and Time: {nepaliDateTime.year}/{nepaliDateTime.month}/{nepaliDateTime.day} {nepaliDateTime.hour}:{nepaliDateTime.minute}:{nepaliDateTime.second}");

#### 2. ConvertUtcToNepaliTime(TimeSpan utcTime)

Converts a given UTC time to Nepali time.

**Parameters:**

* utcTime: The UTC time to convert.

**Returns:**

* The corresponding Nepali time as a TimeSpan.

**Example Usage:**

csharp

Copy code

var nepaliTime = TimeConverter.ConvertUtcToNepaliTime(new TimeSpan(10, 0, 0));

Console.WriteLine($"Nepali Time: {nepaliTime}");

#### 3. ConvertNepaliTimeToUtc(TimeSpan nepaliTime)

Converts a given Nepali time to UTC time.

**Parameters:**

* nepaliTime: The Nepali time to convert.

**Returns:**

* The corresponding UTC time as a TimeSpan.

**Example Usage:**

csharp

Copy code

var utcTime = TimeConverter.ConvertNepaliTimeToUtc(new TimeSpan(15, 45, 0));

Console.WriteLine($"UTC Time: {utcTime}");

This class provides essential utilities for handling time and date conversions between the English and Nepali calendars, as well as between UTC and Nepali times.

**FiscalYearHelper Class**

**Description:** The FiscalYearHelper class provides methods for handling fiscal year operations, including date and time conversions between the English and Nepali calendars.

**Fields:**

1. **None**

### Methods

#### 1. GetYear Method

**Description:** Retrieves the year component from a given date in either English or Nepali calendar systems.

**Parameters:**

* dateInAD: The date in the English or Nepali calendar.
* opr: Specifies the calendar system (English or Nepali).

**Returns:** The year part of the date.

**Example Usage:**

csharp

Copy code

var year = FiscalYearHelper.GetYear(new DateTime(2024, 7, 12), OprDateType.Nepali);

Console.WriteLine($"Year: {year}");

#### 2. GetDay Method

**Description:** Retrieves the day component from a given date in either English or Nepali calendar systems.

**Parameters:**

* dateInAD: The date in the English or Nepali calendar.
* opr: Specifies the calendar system (English or Nepali).

**Returns:** The day part of the date.

**Example Usage:**

csharp

Copy code

var day = FiscalYearHelper.GetDay(new DateTime(2024, 7, 12), OprDateType.Nepali);

Console.WriteLine($"Day: {day}");

#### 3. GetFiscalYear Method

**Description:** Determines the fiscal year based on the provided date and calendar type.

**Parameters:**

* date: The date for which to determine the fiscal year.
* oprDateType: Specifies the calendar system (English or Nepali).

**Returns:** The fiscal year in the format "YYYY/YY".

**Example Usage:**

csharp

Copy code

var fiscalYear = FiscalYearHelper.GetFiscalYear(new DateTime(2024, 7, 12), OprDateType.Nepali);

Console.WriteLine($"Fiscal Year: {fiscalYear}");

#### 4. GetYearListAd Method

**Description:** Retrieves a list of years from the start year (2000) to the current year in the English calendar.

**Returns:** An enumerable list of integers representing years.

**Example Usage:**

csharp

Copy code

var years = FiscalYearHelper.GetYearListAd();

foreach (var year in years)

{

Console.WriteLine($"Year: {year}");

}

#### 5. GetFiscalYearByYear Method

**Description:** Retrieves the fiscal year details based on the provided year in the format "YYYY/YY".

**Parameters:**

* year: The fiscal year to retrieve details for.

**Returns:** The fiscal year details or null if not found.

**Example Usage:**

csharp

Copy code

var fiscalYear = FiscalYearHelper.GetFiscalYearByYear("2076/77");

Console.WriteLine($"Fiscal Year Details: {fiscalYear}");

#### 6. GetTimeDurationFromTwoTimeSpan Method

**Description:** Calculates the duration between two time spans formatted as "HH:mm

".

**Parameters:**

* FromTime: The start time in "HH:mm

" format.

* ToTime: The end time in "HH:mm

" format.

**Returns:** The duration between the two times formatted as "HH hrs mm min ss sec".

**Example Usage:**

csharp

Copy code

var duration = FiscalYearHelper.GetTimeDurationFromTwoTimeSpan("09:00:00", "17:30:00");

Console.WriteLine($"Duration: {duration}");