Building dates from parts

TIME SERIES ANALYSIS IN SQL SERVER

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Dates from parts

```
DATEFROMPARTS(year, month, day)
```

```
TIMEFROMPARTS(hour, minute, second, fraction, precision)
```

```
DATETIMEFROMPARTS(year, month, day, hour, minute, second, ms)
```

```
DATETIME2FROMPARTS(year, month, day, hour, minute, second, fraction, precision)
```

```
SMALLDATETIMEFROMPARTS(year, month, day, hour, minute)
```

```
DATETIMEOFFSETFROMPARTS(year, month, day, hour, minute, second, fraction,
hour_offset, minute_offset, precision)
```

Dates and times together

```
SELECT
    DATETIMEFROMPARTS(1918, 11, 11, 05, 45, 17, 995) AS DT,
    DATETIME2FROMPARTS(1918, 11, 11, 05, 45, 17, 0, 0) AS DT20,
    DATETIME2FROMPARTS(1918, 11, 11, 05, 45, 17, 995, 3) AS DT23,
    DATETIME2FROMPARTS(1918, 11, 11, 05, 45, 17, 9951234, 7) AS DT27;
```

DT	DT20	DT23	DT27
1918-11-11 05:45:17.997	1918-11-11 05:45:17	1918-11-11 05:45:17.995	1918-11-11 05:45:17.9951234

Working with offsets

```
SELECT
    DATETIMEOFFSETFROMPARTS(2009, 08, 14, 21,
        00, 00, 0, 5, 30, 0) AS IST,
    DATETIMEOFFSETFROMPARTS(2009, 08, 14, 21,
        00, 00, 0, 5, 30, 0)
        AT TIME ZONE 'UTC' AS UTC;
```

IST	UTC
2009-08-14 21:00:00 +05:30	2009-08-14 15:30:00 +00:00

Gotchas when working with parts

```
DATEFROMPARTS(1999, 12, NULL)
```

```
DATEFROMPARTS(10000, 01, 01)
```

```
DATETIME2FROMPARTS(1918, 11, 11, 05, 45, 17, 995, 0)
```

```
NULL
```

Cannot construct data type date, some of the arguments have values which are not valid.

Cannot construct data type datetime2, some of the arguments have values which are not valid.

Let's practice!

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Translating date strings

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Casting strings

```
SELECT
    CAST('09/14/99' AS DATE) AS USDate;
```

USDate
1999-09-14

Converting strings

```
SELECT
    CONVERT(DATETIME2(3),
            'April 4, 2019 11:52:29.998 PM') AS April4
```

April4
2019-04-04 23:52:29.998

Parsing strings

```
SELECT
    PARSE('25 Dezember 2014' AS DATE
          USING 'de-de') AS Weihnachten;
```

Weihnachten
2014-12-25

The cost of parsing

Function	Conversions Per Second
`CONVERT()`	251,997
`CAST()`	240,347
`PARSE()`	12,620

Setting languages

```
SET LANGUAGE 'FRENCH'
DECLARE
    @FrenchDate NVARCHAR(30) = N'18 avril 2019',
    @FrenchNumberDate NVARCHAR(30) = N'18/4/2019';

SELECT
    CAST(@FrenchDate AS DATETIME),
    CAST(@FrenchNumberDate  AS DATETIME);
```

```
2019-04-18 00:00:00.000
```

Let's practice!

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Working with offsets

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Anatomy of a DATETIMEOFFSET

Components

Date Part	Example
Date	2019-04-10
Time	12:59:02.3908505
UTC Offset	-04:00

Anatomy of a DATETIMEOFFSET

Components

Date Part	Example
Date	2019-04-10
Time	12:59:02.3908505
UTC Offset	-04:00

Display

```
2019-04-10 12:59:02.3908505 -04:00
```

Changing offsets

```
DECLARE @SomeDate DATETIMEOFFSET =
    '2019-04-10 12:59:02.3908505 -04:00';

SELECT
    SWITCHOFFSET(@SomeDate, '-07:00') AS LATime;
```

LATime
2019-04-10 09:59:02.3908505 -07:00

Converting to DATETIMEOFFSET

```
DECLARE @SomeDate DATETIME2(3) =
    '2019-04-10 12:59:02.390';

SELECT
    TODATETIMEOFFSET(@SomeDate, '-04:00') AS EDT;
```

EDT
2019-04-10 12:59:02.390 -04:00

Time zone swaps with TODATETIMEOFFSET

```
DECLARE @SomeDate DATETIME2(3) =
    '2016-09-04 02:28:29.681';
```

```
SELECT
    TODATETIMEOFFSET(
      DATEADD(HOUR, 7, @SomeDate),
      '+02:00') AS BonnTime;
```

BonnTime
2016-09-04 09:28:29.681 +02:00

Discovering time zones

```
SELECT
    tzi.name,
    tzi.current_utc_offset,
    tzi.is_currently_dst
FROM sys.time_zone_info  tzi
WHERE
    tzi.name LIKE '%Time Zone%';
```

name	current_utc_offset	is_currently_dst
Russia Time Zone 3	+04:00	0
Russia Time Zone 10	+11:00	0
Russia Time Zone 11	+12:00	0

Let's practice!

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Handling invalid dates

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Error-safe date conversion functions

"Unsafe" Functions

`CAST()`

`CONVERT()`

`PARSE()`

Safe Functions

`TRY_CAST()`

`TRY_CONVERT()`

`TRY_PARSE()`

When everything goes right

```
SELECT
    PARSE('01/08/2019' AS DATE USING 'en-us') AS January8US,
    PARSE('01/08/2019' AS DATE USING 'fr-fr') AS August1FR;
GO
```

Results:

January8US	August1FR
2019-01-08	2019-08-01

When everything goes wrong

```
SELECT
    PARSE('01/13/2019' AS DATE USING 'en-us') AS January13US,
    PARSE('01/13/2019' AS DATE USING 'fr-fr') AS Smarch1FR;
GO
```

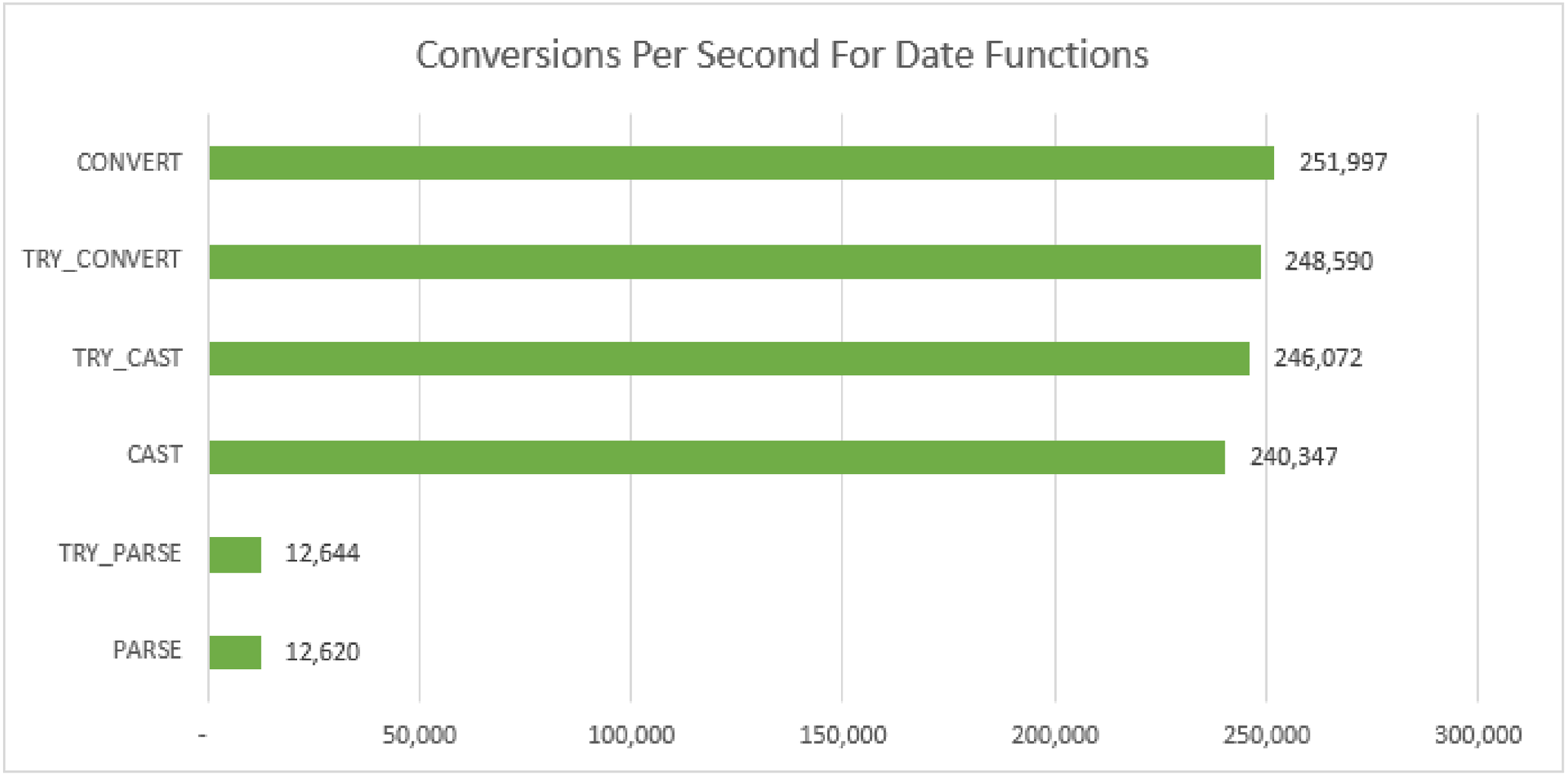
```
**Msg 9819, Level 16, State 1, Line 1**

Error converting string value '01/13/2019' into data type date using culture 'fr-fr'.
```

Doing right when everything goes wrong

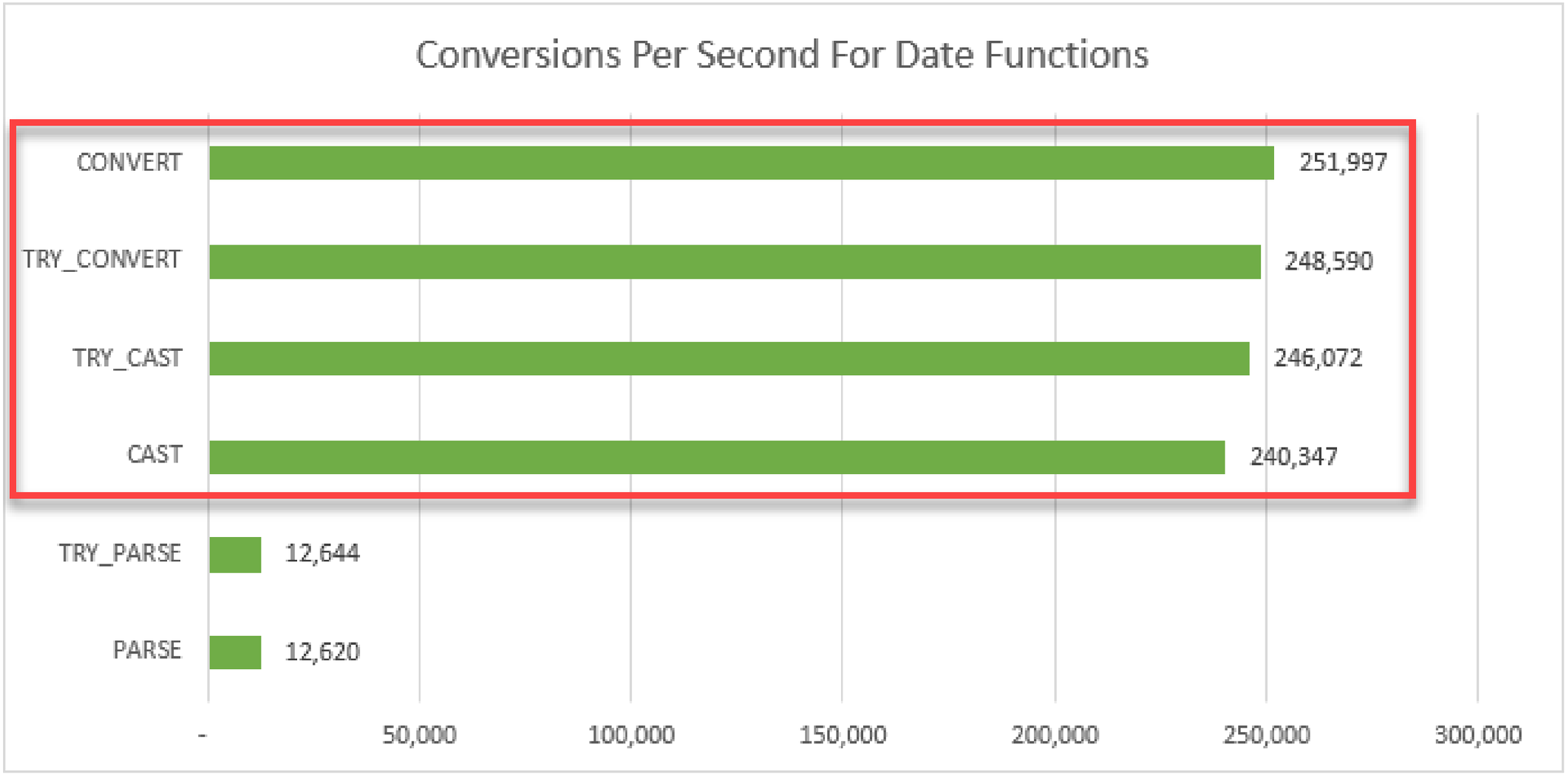
```
SELECT
    TRY_PARSE('01/13/2019' AS DATE USING 'en-us') AS January13US,
    TRY_PARSE('01/13/2019' AS DATE USING 'fr-fr') AS Smarch1FR;
GO
```

January13US	Smarch1FR
2019-01-13	NULL

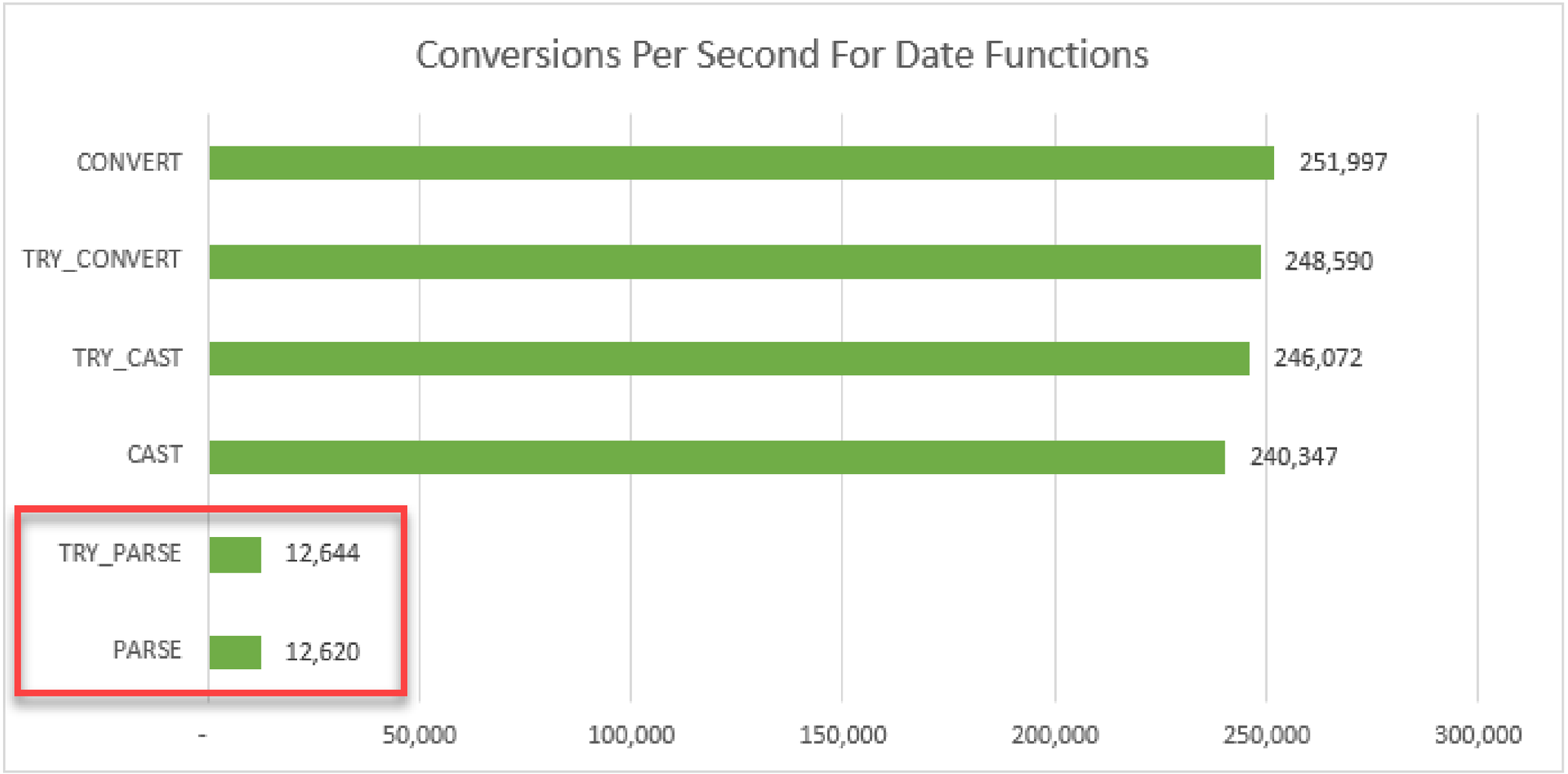
The cost of safety



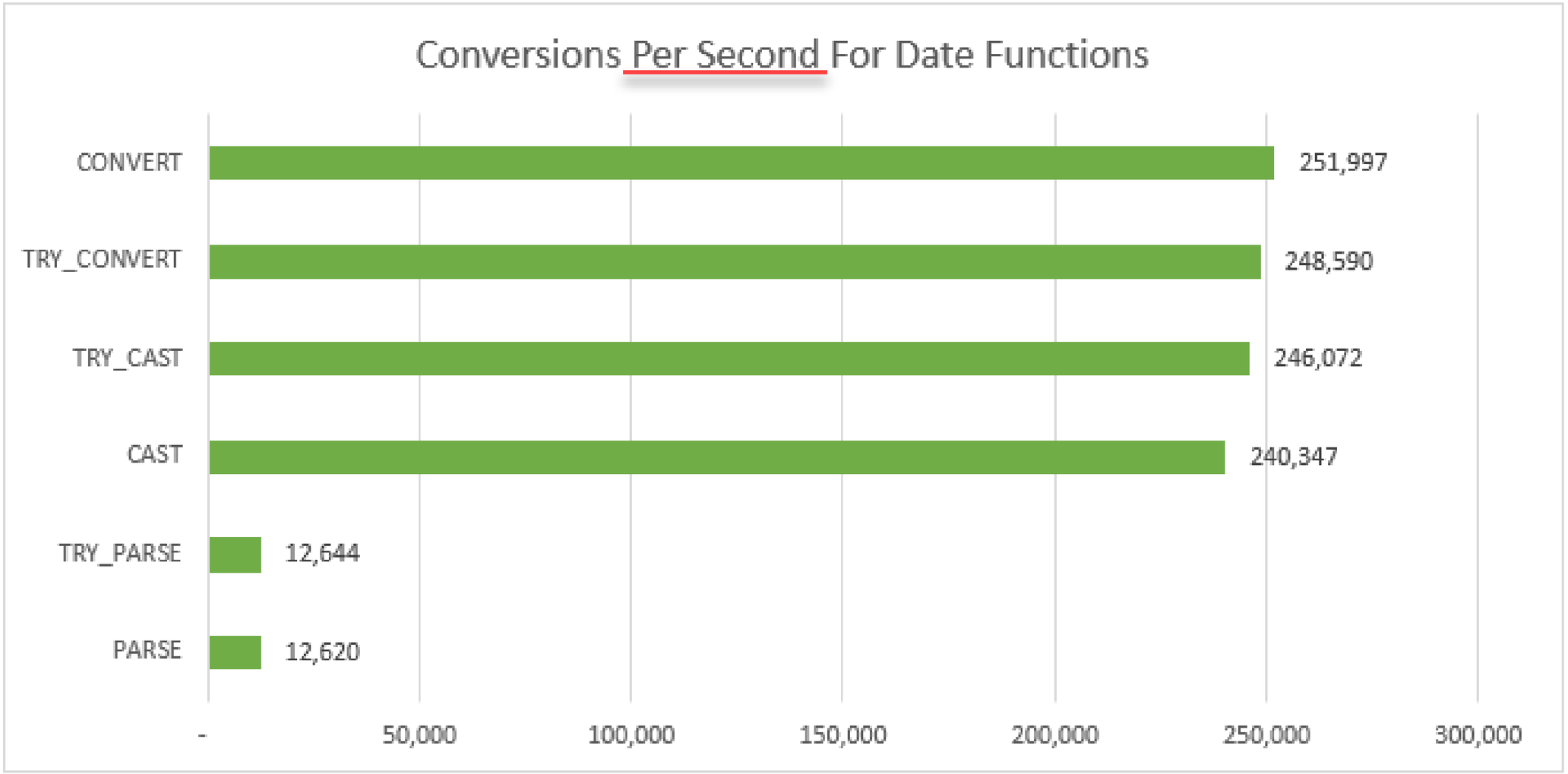
The cost of safety



The cost of safety



The cost of safety



Let's practice

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