Trait std::convert::TryFrom

```
pub trait TryFrom<T> {
    type Error;
    fn try_from(value: T) -> Result<Self, Self::Error>;
}
```

Simple and safe type conversions that may fail in a controlled way under some circumstances. It is the reciprocal of `TryInto`.

This is useful when you are doing a type conversion that may trivially succeed but may also need special handling. For example, there is no way to convert an `i64` into an `i32` using the `From` trait, because an `i64` may contain a value that an `i32` cannot represent and so the conversion would lose data. This might be handled by truncating the `i64` to an `i32` (essentially giving the `i64`'s value modulo `i32::MAX`) or by simply returning `i32::MAX`, or by some other method. The `From` trait is intended for perfect conversions, so the `TryFrom` trait informs the programmer when a type conversion could go bad and lets them decide how to handle it.

Generic Implementations

- `TryFrom<T> for U` implies `TryInto<U> for T`
- `try_from` is reflexive, which means that `TryFrom<T> for T` is implemented and cannot fail – the associated `Error` type for calling `T::try_from()` on a value of type `T` is `Infallible`. When the `!` type is stabilized `Infallible` and `!` will be equivalent.

`TryFrom<T>` can be implemented as follows:

```
use std::convert::TryFrom;

struct GreaterThanZero(i32);

impl TryFrom<i32> for GreaterThanZero {
    type Error = &'static str;

    fn try_from(value: i32) -> Result<Self, Self::Error> {
        if value <= 0 {
            Err("GreaterThanZero only accepts value superior than zero
        } else {
            Ok(GreaterThanZero(value))
        }
    }
}
```

Examples

As described, `i32` implements `TryFrom<i64>`:

```
use std::convert::TryFrom;

let big_number = 1_000_000_000_000i64;
// Silently truncates `big_number`, requires detecting
// and handling the truncation after the fact.
let smaller_number = big_number as i32;
assert_eq!(smaller_number, -727379968);

// Returns an error because `big_number` is too big to
// fit in an `i32`.
let try_smaller_number = i32::try_from(big_number);
assert!(try_smaller_number.is_err());

// Returns `Ok(3)`.
let try_successful_smaller_number = i32::try_from(3);
assert!(try_successful_smaller_number.is_ok());
```

Associated Types

`e Error` [src]

The type returned in the event of a conversion error.

Required methods

`fn try_from(value: T) -> Result<Self, Self::Error>` [src]

Performs the conversion.

Implementors

```
impl TryFrom<i8> for u8                1.34.0 (const: unstable) [src]
impl TryFrom<i8> for u16               1.34.0 (const: unstable) [src]
impl TryFrom<i8> for u32               1.34.0 (const: unstable) [src]
impl TryFrom<i8> for u64               1.34.0 (const: unstable) [src]
impl TryFrom<i8> for u128              1.34.0 (const: unstable) [src]
impl TryFrom<i8> for usize             1.34.0 (const: unstable) [src]
impl TryFrom<i8> for NonZeroI8                             1.46.0 [src]
impl TryFrom<i16> for i8               1.34.0 (const: unstable) [src]
impl TryFrom<i16> for u8               1.34.0 (const: unstable) [src]
impl TryFrom<i16> for u16              1.34.0 (const: unstable) [src]
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impl TryFrom<i16> for usize            1.34.0 (const: unstable) [src]
impl TryFrom<i16> for NonZeroI16                           1.46.0 [src]
impl TryFrom<i32> for i8               1.34.0 (const: unstable) [src]
impl TryFrom<i32> for i16              1.34.0 (const: unstable) [src]
impl TryFrom<i32> for isize            1.34.0 (const: unstable) [src]
impl TryFrom<i32> for u8               1.34.0 (const: unstable) [src]
```

impl TryFrom<i32> for u16 1.34.0 (const: unstable) [src]

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impl TryFrom<NonZeroUsize> for NonZeroU64                       1.49.0 [src]

impl TryFrom<NonZeroUsize> for NonZeroU128                      1.49.0 [src]

impl TryFrom<HandleOrInvalid> for OwnedHandle                          [src]
```

This is supported on **Windows** only.

```
impl TryFrom<HandleOrNull> for OwnedHandle                             [src]
```

This is supported on **Windows** only.

```
impl<'_, T, const N: usize> TryFrom<&'_ [T]> for [T; N]                [src]
where
    T: Copy,

impl<'a, T, const N: usize> TryFrom<&'a [T]> for &'a [T; N]            [src]

impl<'a, T, const N: usize> TryFrom<&'a mut [T]> for &'a mut [T; N]    [src]

impl<T, A, const N: usize> TryFrom<Vec<T, A>> for [T; N]        1.48.0 [src]
where
    A: Allocator,

impl<T, U> TryFrom<U> for T                                            [src]
where
    U: Into<T>,

impl<T, const N: usize> TryFrom<Box<[T], Global>> for Box<[T;   1.43.0 [src]
N], Global>
```

```
mpl<T, const N: usize> TryFrom<Rc<[T]>> for Rc<[T; N]>                 1.43.0 [src]
impl<T, const N: usize> TryFrom<Arc<[T]>> for Arc<[T; N]>               1.43.0 [src]
impl<T, const N: usize> TryFrom<Box<[T], Global>> for Box<[T; N]>
impl<T, const N: usize> TryFrom<Rc<[T]>> for Rc<[T; N]>
impl<T, const N: usize> TryFrom<Arc<[T]>> for Arc<[T; N]>
impl<T, A: Allocator, const N: usize> TryFrom<Vec<T, A>> for [T; N]
```