

The background features a dark blue gradient with a starry space pattern. On the left side, there are several overlapping circular elements, including a large white arc with a scale from 140 to 260, and several smaller circles with dashed outlines and arrows, suggesting a technical or scientific theme.

COORDFIXR

R PACKAGE FOR COORDINATE CONVERSION

WHY CONVERTING COORDINATES INTO DECIMAL DEGREES?

1. Analysis:

Most modern **mapping software, GIS tools, and geospatial databases** require coordinates in **decimal degrees format (DD)** for seamless data input, processing, and visualization.

This format allows for straightforward numerical computations **needed for spatial analysis and distance calculations.**

2. Standardisation

3. Precision and Compability

4. Simplicity for Data Integration

Etc...

CHALLENGES OF CONVERTING COORDINATES TO DECIMAL DEGREES

1. Variety of Notations:

Coordinates can be represented in formats such as **Degrees, Minutes, Seconds (DMS)** or **Degrees and Decimal Minutes (DDM)**. Each notation requires distinct parsing rules, and misinterpretation can lead to conversion errors.

2. Inconsistent Symbols:

Notations use various symbols, such as °, ', and ", their textual equivalents ('degrees', 'minutes', 'seconds') or abbreviations like ('deg', 'min', 'sec'). Recognizing and handling these variations accurately is essential for proper conversion.

3. Language and Regional Differences:

Different languages and regions may format coordinates differently (e.g., using **commas (',')** instead of **periods ('.')** as **decimal separators**), complicating the parsing process.

4. Data Quality and Typos:

Input data, especially in spreadsheets, may contain **typos**, **extra spaces**, or **missing symbols**, which can disrupt automated conversion and require pre-processing.

5. Mixed Notations:

Data may combine multiple coordinate formats within the same dataset, making it difficult to standardize and convert without sophisticated handling logic.

6. Hemisphere Indicators:

Coordinates may use words (e.g. '**North**', '**South**'), letters (**N/S/E/W**) or positive/negative signs ('+' or '-') to indicate direction. Inconsistent or missing indicators can lead to incorrect placement of coordinates.

7. Etc ...

WICH FORMATS OR NOTATIONS ARE USED FOR COORDINATES?

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1. Degrees, Minutes, Seconds (DMS), e.g. $73^{\circ} 59' 8.9988''$ S

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2. Degrees and Decimal Minutes (DDM), e.g. $73^{\circ} 59.14998' S$

WICH FORMATS OR NOTATIONS ARE USED FOR COORDINATES?

1. Degrees, Minutes, Seconds (DMS), e.g. $73^{\circ} 59' 8.9988''$ S
2. Degrees and Decimal Minutes (DDM), e.g. $73^{\circ} 59.14998'$ S
3. Decimal degrees (DD), e.g. -73.985833° oder -73.985833

WICH FORMATS OR NOTATIONS ARE USED FOR COORDINATES?

1. Degrees, Minutes, Seconds (DMS), e.g. $73^{\circ} 59' 8.9988'' S$
2. Degrees and Decimal Minutes (DDM), e.g. $73^{\circ} 59.14998' S$
3. Decimal degrees (DD), e.g. -73.985833° oder -73.985833

This means that there are already **four** possible spellings for the same value.

WHICH FORMATS OR NOTATIONS ARE USED FOR COORDINATES?

1. Degrees, Minutes, Seconds (DMS), e.g. $73^{\circ} 59' 8.9988''$ S or S $73^{\circ} 59' 8.9988''$
2. Degrees and Decimal Minutes (DDM), e.g. $73^{\circ} 59.14998'$ S or S $73^{\circ} 59.14998'$
3. Decimal degrees (DD), e.g. -73.985833° or -73.985833

This means that there are already **six** possible spellings for the same value.

But only the last notation ' -73.985833 ' being numeric and can be used for (GIS) analysis.

LET US HAVE A LOOK AT THE FORMAT „DMS“



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We know this spelling from the previous page:

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73° 59′ 8.9988″ S

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But some countries use the comma as a decimal separator...

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We know this spelling from the previous page:

$73^{\circ} 59' 8.9988'' S$

But some countries use the comma as a decimal separator...

$73^{\circ} 59' 8,9988'' S$

Possible notations so far: 2

LET US HAVE A LOOK AT THE FORMAT „DMS“

73° 59' 8.9988" S

73° 59' 8,9988" S

Possible notations so far: 2

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Possible notations so far: 2

LET US HAVE A LOOK AT THE FORMAT „DMS“

73° 59' 8.9988" S

73° 59' 8,9988" S

The data scientist may, however, have opted to use the terms 'degrees,' 'minutes', and 'seconds' instead of the symbols °, ', and ".

Possible notations so far: 2

LET US HAVE A LOOK AT THE FORMAT „DMS“

73° 59' 8.9988" S

73° 59' 8,9988" S

The data scientist may, however, have opted to use the terms 'degrees,' 'minutes', and 'seconds' instead of the symbols °, ', and ".

73 degree 59 minutes 8.9988 seconds S 73 degree 59 minutes 8,9988 seconds S

Possible notations so far: 4

LET US HAVE A LOOK AT THE FORMAT „DMS“

73° 59' 8.9988" S
73° 59' 8,9988" S

73 degree 59 minutes 8.9988 seconds S

73 degree 59 minutes 8,9988 seconds S

Possible notations so far: 4

LET US HAVE A LOOK AT THE FORMAT „DMS“

73° 59' 8.9988" S 73 degree 59 minutes 8.9988 seconds S

73° 59' 8,9988" S 73 degree 59 minutes 8,9988 seconds S

Possible notations so far: 4

LET US HAVE A LOOK AT THE FORMAT „DMS“

73° 59' 8.9988" S 73 degree 59 minutes 8.9988 seconds S

73° 59' 8,9988" S 73 degree 59 minutes 8,9988 seconds S

... or abbreviations for 'degrees', 'minutes' and 'seconds' were used (e.g. 'deg', 'min' and 'sec')

Possible notations so far: 4

LET US HAVE A LOOK AT THE FORMAT „DMS“

73° 59′ 8.9988″ S 73 degree 59 minutes 8.9988 seconds S

73° 59′ 8,9988″ S 73 degree 59 minutes 8,9988 seconds S

... or abbreviations for ‘degrees’, ‘minutes’ and ‘seconds’ were used (e.g. ‘deg’, ‘min’ and ‘sec’)

73 deg 59 min 8.9988 sec S

73 deg 59 min 8,9988 sec S

Possible notations so far: 6

LET US HAVE A LOOK AT THE FORMAT „DMS“

73° 59' 8.9988" S 73 degree 59 minutes 8.9988 seconds S

73° 59' 8,9988" S 73 degree 59 minutes 8,9988 seconds S

73 deg 59 min 8.9988 sec S

73 deg 59 min 8,9988 sec S

Possible notations so far: 6

LET US HAVE A LOOK AT THE FORMAT „DMS“

73° 59' 8.9988" S 73 degree 59 minutes 8.9988 seconds S

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... or neither designations nor abbreviations were used and instead an underscore was inserted.

Possible notations so far: 6

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73° 59′ 8.9988″ S 73 degree 59 minutes 8.9988 seconds S 73 deg 59 min 8.9988 sec S
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... or neither designations nor abbreviations were used and instead an underscore was inserted.

73_59_8.9988_S

73_59_8,9988_S

Possible notations so far: 8

LET US HAVE A LOOK AT THE FORMAT „DMS“

73° 59' 8.9988" S 73 degree 59 minutes 8.9988 seconds S 73 deg 59 min 8.9988 sec S
73° 59' 8,9988" S 73 degree 59 minutes 8,9988 seconds S 73 deg 59 min 8,9988 sec S

73_59_8.9988_S

73_59_8,9988_S

Possible notations so far: 8

LET US HAVE A LOOK AT THE FORMAT „DMS“

73° 59' 8.9988" S 73 degree 59 minutes 8.9988 seconds S 73 deg 59 min 8.9988 sec S

73° 59' 8,9988" S 73 degree 59 minutes 8,9988 seconds S 73 deg 59 min 8,9988 sec S

73_59_8.9988_S

73_59_8,9988_S

Possible notations so far: 8

LET US HAVE A LOOK AT THE FORMAT „DMS“

73° 59' 8.9988" S 73 degree 59 minutes 8.9988 seconds S 73 deg 59 min 8.9988 sec S 73_59_8.9988_S
73° 59' 8,9988" S 73 degree 59 minutes 8,9988 seconds S 73 deg 59 min 8,9988 sec S 73_59_8,9988_S

Possible notations so far: 8

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73° 59' 8.9988" S 73 degree 59 minutes 8.9988 seconds S 73 deg 59 min 8.9988 sec S 73_59_8.9988_S
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... the hemisphere designation (N, O, S and W) could also be placed in front.

Possible notations so far: 8

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73° 59' 8.9988" S 73 degree 59 minutes 8.9988 seconds S 73 deg 59 min 8.9988 sec S 73_59_8.9988_S
73° 59' 8,9988" S 73 degree 59 minutes 8,9988 seconds S 73 deg 59 min 8,9988 sec S 73_59_8,9988_S

... the hemisphere designation (N, O, S and W) could also be placed in front.

S 73° 59' 8.9988" S 73 degree 59 minutes 8.9988 seconds S 73 deg 59 min 8.9988 sec S_73_59_8.9988
S 73° 59' 8,9988" S 73 degree 59 minutes 8,9988 seconds S 73 deg 59 min 8,9988 sec S_73_59_8,9988

Possible notations so far: 16

LET US HAVE A LOOK AT THE FORMAT „DMS“

73° 59' 8.9988" S 73 degree 59 minutes 8.9988 seconds S 73 deg 59 min 8.9988 sec S 73_59_8.9988_S
73° 59' 8,9988" S 73 degree 59 minutes 8,9988 seconds S 73 deg 59 min 8,9988 sec S 73_59_8,9988_S

S 73° 59' 8.9988" S 73 degree 59 minutes 8.9988 seconds S 73 deg 59 min 8.9988 sec S_73_59_8.9988
S 73° 59' 8,9988" S 73 degree 59 minutes 8,9988 seconds S 73 deg 59 min 8,9988 sec S_73_59_8,9988

Possible notations so far: 16

LET US HAVE A LOOK AT THE FORMAT „DMS“

73° 59' 8.9988" S 73 degree 59 minutes 8.9988 seconds S 73 deg 59 min 8.9988 sec S 73_59_8.9988_S
73° 59' 8,9988" S 73 degree 59 minutes 8,9988 seconds S 73 deg 59 min 8,9988 sec S 73_59_8,9988_S

S 73° 59' 8.9988"
S 73° 59' 8,9988"

S 73 degree 59 minutes 8.9988 seconds
S 73 degree 59 minutes 8,9988 seconds

S 73 deg 59 min 8.9988 sec
S 73 deg 59 min 8,9988 sec

S_73_59_8.9988
S_73_59_8,9988

Possible notations so far: 16

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73° 59' 8.9988" S	73 degree 59 minutes 8.9988 seconds S	73 deg 59 min 8.9988 sec S	73_59_8.9988_S
73° 59' 8,9988" S	73 degree 59 minutes 8,9988 seconds S	73 deg 59 min 8,9988 sec S	73_59_8,9988_S
S 73° 59' 8.9988"	S 73 degree 59 minutes 8.9988 seconds	S 73 deg 59 min 8.9988 sec	S_73_59_8.9988
S 73° 59' 8,9988"	S 73 degree 59 minutes 8,9988 seconds	S 73 deg 59 min 8,9988 sec	S_73_59_8,9988

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73° 59' 8.9988" S	73 degree 59 minutes 8.9988 seconds S	73 deg 59 min 8.9988 sec S	73_59_8.9988_S
73° 59' 8,9988" S	73 degree 59 minutes 8,9988 seconds S	73 deg 59 min 8,9988 sec S	73_59_8,9988_S
S 73° 59' 8.9988"	S 73 degree 59 minutes 8.9988 seconds	S 73 deg 59 min 8.9988 sec	S_73_59_8.9988
S 73° 59' 8,9988"	S 73 degree 59 minutes 8,9988 seconds	S 73 deg 59 min 8,9988 sec	S_73_59_8,9988

The hemisphere designation (N, E, S and W) could also be written out as a word
(‘North’, ‘East’, ‘South’, ‘West’)

Possible notations so far: 32

LET US HAVE A LOOK AT THE FORMAT „DMS“

73° 59' 8.9988" S	73 degree 59 minutes 8.9988 seconds S	73 deg 59 min 8.9988 sec S	73_59_8.9988_S
73° 59' 8,9988" S	73 degree 59 minutes 8,9988 seconds S	73 deg 59 min 8,9988 sec S	73_59_8,9988_S
S 73° 59' 8.9988"	S 73 degree 59 minutes 8.9988 seconds	S 73 deg 59 min 8.9988 sec	S_73_59_8.9988
S 73° 59' 8,9988"	S 73 degree 59 minutes 8,9988 seconds	S 73 deg 59 min 8,9988 sec	S_73_59_8,9988

The hemisphere designation (N, E, S and W) could also be written out as a word
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73° 59' 8.9988" South	73 degree 59 minutes 8.9988 seconds South	73 deg 59 min 8.9988 sec South	73_59_8.9988_South
S 73° 59' 8,9988" South	73 degree 59 minutes 8,9988 seconds South	73 deg 59 min 8,9988 sec South	73_59_8,9988_South
South 73° 59' 8.9988"	South 73 degree 59 minutes 8.9988 seconds	South 73 deg 59 min 8.9988 sec	South_73_59_8.9988
South 73° 59' 8,9988"	South 73 degree 59 minutes 8,9988 seconds	South 73 deg 59 min 8,9988 sec	South_73_59_8,9988

Possible notations so far: 32

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73° 59' 8.9988" S	73 degree 59 minutes 8.9988 seconds S	73 deg 59 min 8.9988 sec S	73_59_8.9988_S
73° 59' 8,9988" S	73 degree 59 minutes 8,9988 seconds S	73 deg 59 min 8,9988 sec S	73_59_8,9988_S
S 73° 59' 8.9988"	S 73 degree 59 minutes 8.9988 seconds	S 73 deg 59 min 8.9988 sec	S_73_59_8.9988
S 73° 59' 8,9988"	S 73 degree 59 minutes 8,9988 seconds	S 73 deg 59 min 8,9988 sec	S_73_59_8,9988

73° 59' 8.9988" South	73 degree 59 minutes 8.9988 seconds South	73 deg 59 min 8.9988 sec South	73_59_8.9988_South
S 73° 59' 8,9988" South	73 degree 59 minutes 8,9988 seconds South	73 deg 59 min 8,9988 sec South	73_59_8,9988_South
South 73° 59' 8.9988"	South 73 degree 59 minutes 8.9988 seconds	South 73 deg 59 min 8.9988 sec	South_73_59_8.9988
South 73° 59' 8,9988"	South 73 degree 59 minutes 8,9988 seconds	South 73 deg 59 min 8,9988 sec	South_73_59_8,9988

Possible notations so far: 32

LET US HAVE A LOOK AT THE FORMAT „DMS“

73° 59′ 8.9988″ S	73 degree 59 minutes 8.9988 seconds S	73 deg 59 min 8.9988 sec S	73_59_8.9988_S
73° 59′ 8,9988″ S	73 degree 59 minutes 8,9988 seconds S	73 deg 59 min 8,9988 sec S	73_59_8,9988_S
S 73° 59′ 8.9988″	S 73 degree 59 minutes 8.9988 seconds	S 73 deg 59 min 8.9988 sec	S_73_59_8.9988
S 73° 59′ 8,9988″	S 73 degree 59 minutes 8,9988 seconds	S 73 deg 59 min 8,9988 sec	S_73_59_8,9988

73° 59′ 8.9988″ South
S 73° 59′ 8,9988″ South
South 73° 59′ 8.9988″
South 73° 59′ 8,9988″

73 degree 59 minutes 8.9988 seconds South
73 degree 59 minutes 8,9988 seconds South
South 73 degree 59 minutes 8.9988 seconds
South 73 degree 59 minutes 8,9988 seconds

73 deg 59 min 8.9988 sec South
73 deg 59 min 8,9988 sec South
South 73 deg 59 min 8.9988 sec
South 73 deg 59 min 8,9988 sec

73_59_8.9988_South
73_59_8,9988_South
South_73_59_8.9988
South_73_59_8,9988

Possible notations so far: 32

LET US HAVE A LOOK AT THE FORMAT „DMS“

73° 59' 8.9988" S	73 degree 59 minutes 8.9988 seconds S	73 deg 59 min 8.9988 sec S	73_59_8.9988_S
73° 59' 8,9988" S	73 degree 59 minutes 8,9988 seconds S	73 deg 59 min 8,9988 sec S	73_59_8,9988_S
S 73° 59' 8.9988"	S 73 degree 59 minutes 8.9988 seconds	S 73 deg 59 min 8.9988 sec	S_73_59_8.9988
S 73° 59' 8,9988"	S 73 degree 59 minutes 8,9988 seconds	S 73 deg 59 min 8,9988 sec	S_73_59_8,9988
73° 59' 8.9988" South	73 degree 59 minutes 8.9988 seconds South	73 deg 59 min 8.9988 sec South	73_59_8.9988_South
73° 59' 8,9988" South	73 degree 59 minutes 8,9988 seconds South	73 deg 59 min 8,9988 sec South	73_59_8,9988_South
South 73° 59' 8.9988"	South 73 degree 59 minutes 8.9988 seconds	South 73 deg 59 min 8.9988 sec	South_73_59_8.9988
South 73° 59' 8,9988"	South 73 degree 59 minutes 8,9988 seconds	South 73 deg 59 min 8,9988 sec	South_73_59_8,9988

Possible notations so far: 32

LET US HAVE A LOOK AT THE FORMAT „DMS“

73° 59' 8.9988" S	73 degree 59 minutes 8.9988 seconds S	73 deg 59 min 8.9988 sec S	73_59_8.9988_S
73° 59' 8,9988" S	73 degree 59 minutes 8,9988 seconds S	73 deg 59 min 8,9988 sec S	73_59_8,9988_S
S 73° 59' 8.9988"	S 73 degree 59 minutes 8.9988 seconds	S 73 deg 59 min 8.9988 sec	S_73_59_8.9988
S 73° 59' 8,9988"	S 73 degree 59 minutes 8,9988 seconds	S 73 deg 59 min 8,9988 sec	S_73_59_8,9988
73° 59' 8.9988" South	73 degree 59 minutes 8.9988 seconds South	73 deg 59 min 8.9988 sec South	73_59_8.9988_South
73° 59' 8,9988"South	73 degree 59 minutes 8,9988 seconds South	73 deg 59 min 8,9988 sec South	73_59_8,9988_South
South 73° 59' 8.9988"	South 73 degree 59 minutes 8.9988 seconds	South 73 deg 59 min 8.9988 sec	South_73_59_8.9988
South 73° 59' 8,9988"	South 73 degree 59 minutes 8,9988 seconds	South 73 deg 59 min 8,9988 sec	South_73_59_8,9988

The southern and western hemisphere can also be characterised by a preceding minus ('-').

Possible notations so far: 32

LET US HAVE A LOOK AT THE FORMAT „DMS“

73° 59' 8.9988" S	73 degree 59 minutes 8.9988 seconds S	73 deg 59 min 8.9988 sec S	73_59_8.9988_S
73° 59' 8,9988" S	73 degree 59 minutes 8,9988 seconds S	73 deg 59 min 8,9988 sec S	73_59_8,9988_S
S 73° 59' 8.9988"	S 73 degree 59 minutes 8.9988 seconds	S 73 deg 59 min 8.9988 sec	S_73_59_8.9988
S 73° 59' 8,9988"	S 73 degree 59 minutes 8,9988 seconds	S 73 deg 59 min 8,9988 sec	S_73_59_8,9988
73° 59' 8.9988" South	73 degree 59 minutes 8.9988 seconds South	73 deg 59 min 8.9988 sec South	73_59_8.9988_South
73° 59' 8,9988" South	73 degree 59 minutes 8,9988 seconds South	73 deg 59 min 8,9988 sec South	73_59_8,9988_South
South 73° 59' 8.9988"	South 73 degree 59 minutes 8.9988 seconds	South 73 deg 59 min 8.9988 sec	South_73_59_8.9988
South 73° 59' 8,9988"	South 73 degree 59 minutes 8,9988 seconds	South 73 deg 59 min 8,9988 sec	South_73_59_8,9988

The southern and western hemisphere can also be characterised by a preceding minus ('-').

-73° 59' 8.9988"	-73 degree 59 minutes 8.9988 seconds	-73 deg 59 min 8.9988 sec	-73_59_8.9988
-73° 59' 8,9988"	-73 degree 59 minutes 8,9988 seconds	-73 deg 59 min 8,9988 sec	-73_59_8,9988

Possible notations so far: 40

LET US HAVE A LOOK AT THE FORMAT „DMS“

73° 59' 8.9988" S	73 degree 59 minutes 8.9988 seconds S	73 deg 59 min 8.9988 sec S	73_59_8.9988_S
73° 59' 8,9988" S	73 degree 59 minutes 8,9988 seconds S	73 deg 59 min 8,9988 sec S	73_59_8,9988_S
S 73° 59' 8.9988"	S 73 degree 59 minutes 8.9988 seconds	S 73 deg 59 min 8.9988 sec	S_73_59_8.9988
S 73° 59' 8,9988"	S 73 degree 59 minutes 8,9988 seconds	S 73 deg 59 min 8,9988 sec	S_73_59_8,9988
73° 59' 8.9988" South	73 degree 59 minutes 8.9988 seconds South	73 deg 59 min 8.9988 sec South	73_59_8.9988_South
73° 59' 8,9988" South	73 degree 59 minutes 8,9988 seconds South	73 deg 59 min 8,9988 sec South	73_59_8,9988_South
South 73° 59' 8.9988"	South 73 degree 59 minutes 8.9988 seconds	South 73 deg 59 min 8.9988 sec	South_73_59_8.9988
South 73° 59' 8,9988"	South 73 degree 59 minutes 8,9988 seconds	South 73 deg 59 min 8,9988 sec	South_73_59_8,9988

-73° 59' 8.9988"
-73° 59' 8,9988"

-73 degree 59 minutes 8.9988 seconds
-73 degree 59 minutes 8,9988 seconds

-73 deg 59 min 8.9988 sec
-73 deg 59 min 8,9988 sec

-73_59_8.9988
-73_59_8,9988

Possible notations so far: 40

LET US HAVE A LOOK AT THE FORMAT „DMS“

73° 59' 8.9988" S	73 degree 59 minutes 8.9988 seconds S	73 deg 59 min 8.9988 sec S	73_59_8.9988_S
73° 59' 8,9988" S	73 degree 59 minutes 8,9988 seconds S	73 deg 59 min 8,9988 sec S	73_59_8,9988_S
S 73° 59' 8.9988"	S 73 degree 59 minutes 8.9988 seconds	S 73 deg 59 min 8.9988 sec	S_73_59_8.9988
S 73° 59' 8,9988"	S 73 degree 59 minutes 8,9988 seconds	S 73 deg 59 min 8,9988 sec	S_73_59_8,9988
73° 59' 8.9988" South	73 degree 59 minutes 8.9988 seconds South	73 deg 59 min 8.9988 sec South	73_59_8.9988_South
73° 59' 8,9988" South	73 degree 59 minutes 8,9988 seconds South	73 deg 59 min 8,9988 sec South	73_59_8,9988_South
South 73° 59' 8.9988"	South 73 degree 59 minutes 8.9988 seconds	South 73 deg 59 min 8.9988 sec	South_73_59_8.9988
South 73° 59' 8,9988"	South 73 degree 59 minutes 8,9988 seconds	South 73 deg 59 min 8,9988 sec	South_73_59_8,9988

-73° 59' 8.9988"

-73 degree 59 minutes 8.9988 seconds

-73 deg 59 min 8.9988 sec

-73_59_8.9988

-73° 59' 8,9988"

-73 degree 59 minutes 8,9988 seconds

-73 deg 59 min 8,9988 sec

-73_59_8,9988

Possible notations so far: 40

LET US HAVE A LOOK AT THE FORMAT „DMS“

73° 59' 8.9988" S	73 degree 59 minutes 8.9988 seconds S	73 deg 59 min 8.9988 sec S	73_59_8.9988_S
73° 59' 8,9988" S	73 degree 59 minutes 8,9988 seconds S	73 deg 59 min 8,9988 sec S	73_59_8,9988_S
S 73° 59' 8.9988"	S 73 degree 59 minutes 8.9988 seconds	S 73 deg 59 min 8.9988 sec	S_73_59_8.9988
S 73° 59' 8,9988"	S 73 degree 59 minutes 8,9988 seconds	S 73 deg 59 min 8,9988 sec	S_73_59_8,9988
73° 59' 8.9988" South	73 degree 59 minutes 8.9988 seconds South	73 deg 59 min 8.9988 sec South	73_59_8.9988_South
73° 59' 8,9988" South	73 degree 59 minutes 8,9988 seconds South	73 deg 59 min 8,9988 sec South	73_59_8,9988_South
South 73° 59' 8.9988"	South 73 degree 59 minutes 8.9988 seconds	South 73 deg 59 min 8.9988 sec	South_73_59_8.9988
South 73° 59' 8,9988"	South 73 degree 59 minutes 8,9988 seconds	South 73 deg 59 min 8,9988 sec	South_73_59_8,9988
-73° 59' 8.9988"	-73 degree 59 minutes 8.9988 seconds	-73 deg 59 min 8.9988 sec	-73_59_8.9988
-73° 59' 8,9988"	-73 degree 59 minutes 8,9988 seconds	-73 deg 59 min 8,9988 sec	-73_59_8,9988

Possible notations so far: 40

LET US HAVE A LOOK AT THE FORMAT „DMS“

73° 59' 8.9988" S	73 degree 59 minutes 8.9988 seconds S	73 deg 59 min 8.9988 sec S	<u>73_59_8.9988_S</u>
73° 59' 8,9988" S	73 degree 59 minutes 8,9988 seconds S	73 deg 59 min 8,9988 sec S	<u>73_59_8,9988_S</u>
S 73° 59' 8.9988"	S 73 degree 59 minutes 8.9988 seconds	S 73 deg 59 min 8.9988 sec	<u>S_73_59_8.9988</u>
S 73° 59' 8,9988"	S 73 degree 59 minutes 8,9988 seconds	S 73 deg 59 min 8,9988 sec	<u>S_73_59_8,9988</u>
73° 59' 8.9988" South	73 degree 59 minutes 8.9988 seconds South	73 deg 59 min 8.9988 sec South	<u>73_59_8.9988_South</u>
73° 59' 8,9988" South	73 degree 59 minutes 8,9988 seconds South	73 deg 59 min 8,9988 sec South	<u>73_59_8,9988_South</u>
South 73° 59' 8.9988"	South 73 degree 59 minutes 8.9988 seconds	South 73 deg 59 min 8.9988 sec	<u>South_73_59_8.9988</u>
South 73° 59' 8,9988"	South 73 degree 59 minutes 8,9988 seconds	South 73 deg 59 min 8,9988 sec	<u>South_73_59_8,9988</u>
-73° 59' 8.9988"	-73 degree 59 minutes 8.9988 seconds	-73 deg 59 min 8.9988 sec	<u>-73_59_8.9988</u>
-73° 59' 8,9988"	-73 degree 59 minutes 8,9988 seconds	-73 deg 59 min 8,9988 sec	<u>-73_59_8,9988</u>

Underlines may have been used instead of spaces.

Possible notations so far: 40

LET US HAVE A LOOK AT THE FORMAT „DMS“

73° 59' 8.9988" S	73 degree 59 minutes 8.9988 seconds S	73 deg 59 min 8.9988 sec S	73_59_8.9988_S
73° 59' 8,9988" S	73 degree 59 minutes 8,9988 seconds S	73 deg 59 min 8,9988 sec S	73_59_8,9988_S
S 73° 59' 8.9988"	S 73 degree 59 minutes 8.9988 seconds	S 73 deg 59 min 8.9988 sec	S_73_59_8.9988
S 73° 59' 8,9988"	S 73 degree 59 minutes 8,9988 seconds	S 73 deg 59 min 8,9988 sec	S_73_59_8,9988
73° 59' 8.9988" South	73 degree 59 minutes 8.9988 seconds South	73 deg 59 min 8.9988 sec South	73_59_8.9988_South
73° 59' 8,9988" South	73 degree 59 minutes 8,9988 seconds South	73 deg 59 min 8,9988 sec South	73_59_8,9988_South
South 73° 59' 8.9988"	South 73 degree 59 minutes 8.9988 seconds	South 73 deg 59 min 8.9988 sec	South_73_59_8.9988
South 73° 59' 8,9988"	South 73 degree 59 minutes 8,9988 seconds	South 73 deg 59 min 8,9988 sec	South_73_59_8,9988
-73° 59' 8.9988"	-73 degree 59 minutes 8.9988 seconds	-73 deg 59 min 8.9988 sec	-73_59_8.9988
-73° 59' 8,9988"	-73 degree 59 minutes 8,9988 seconds	-73 deg 59 min 8,9988 sec	-73_59_8,9988

Underlines may have been used instead of spaces.

73°_59'_8.9988"_S
73°_59'_8,9988"_S
S_73°_59'_8.9988"
S_73°_59'_8,9988"
73°_59'_8.9988"_South
73°_59'_8,9988"_South
South_73°_59'_8.9988"
South_73°_59'_8,9988"
-73°_59'_8.9988"
-73°_59'_8,9988"

73_degree_59_minutes_8.9988_seconds_S
73_degree_59_minutes_8,9988_seconds_S
S_73_degree_59_minutes_8.9988_seconds
S_73_degree_59_minutes_8,9988_seconds
73_degree_59_minutes_8.9988_seconds_South
73_degree_59_minutes_8,9988_seconds_South
South_73_degree_59_minutes_8.9988_seconds
South_73_degree_59_minutes_8,9988_seconds
-73_degree_59_minutes_8.9988_seconds
-73_degree_59_minutes_8,9988_seconds

73_deg_59_min_8.9988_sec_S
73_deg_59_min_8,9988_sec_S
S_73_deg_59_min_8.9988_sec
S_73_deg_59_min_8,9988_sec
73_deg_59_min_8.9988_sec_South
73_deg_59_min_8,9988_sec_South
South_73_deg_59_min_8.9988_sec
South_73_deg_59_min_8,9988_sec
-73_deg_59_min_8.9988_sec
-73_deg_59_min_8,9988_sec

Possible notations so far: 70

LET US HAVE A LOOK AT THE FORMAT „DMS“

73° 59' 8.9988" S	73 degree 59 minutes 8.9988 seconds S	73 deg 59 min 8.9988 sec S	73_59_8.9988_S
73° 59' 8,9988" S	73 degree 59 minutes 8,9988 seconds S	73 deg 59 min 8,9988 sec S	73_59_8,9988_S
S 73° 59' 8.9988"	S 73 degree 59 minutes 8.9988 seconds	S 73 deg 59 min 8.9988 sec	S_73_59_8.9988
S 73° 59' 8,9988"	S 73 degree 59 minutes 8,9988 seconds	S 73 deg 59 min 8,9988 sec	S_73_59_8,9988
73° 59' 8.9988" South	73 degree 59 minutes 8.9988 seconds South	73 deg 59 min 8.9988 sec South	73_59_8.9988_South
73° 59' 8,9988" South	73 degree 59 minutes 8,9988 seconds South	73 deg 59 min 8,9988 sec South	73_59_8,9988_South
South 73° 59' 8.9988"	South 73 degree 59 minutes 8.9988 seconds	South 73 deg 59 min 8.9988 sec	South_73_59_8.9988
South 73° 59' 8,9988"	South 73 degree 59 minutes 8,9988 seconds	South 73 deg 59 min 8,9988 sec	South_73_59_8,9988
-73° 59' 8.9988"	-73 degree 59 minutes 8.9988 seconds	-73 deg 59 min 8.9988 sec	-73_59_8.9988
-73° 59' 8,9988"	-73 degree 59 minutes 8,9988 seconds	-73 deg 59 min 8,9988 sec	-73_59_8,9988

73°_59'_8.9988"_S
73°_59'_8,9988"_S
S_73°_59'_8.9988"
S_73°_59'_8,9988"
73°_59'_8.9988"_South
73°_59'_8,9988"_South
South_73°_59'_8.9988"
South_73°_59'_8,9988"
-73°_59'_8.9988"
-73°_59'_8,9988"

73_degree_59_minutes_8.9988_seconds_S
73_degree_59_minutes_8,9988_seconds_S
S_73_degree_59_minutes_8.9988_seconds
S_73_degree_59_minutes_8,9988_seconds
73_degree_59_minutes_8.9988_seconds_South
73_degree_59_minutes_8,9988_seconds_South
South_73_degree_59_minutes_8.9988_seconds
South_73_degree_59_minutes_8,9988_seconds
-73_degree_59_minutes_8.9988_seconds
-73_degree_59_minutes_8,9988_seconds

73_deg_59_min_8.9988_sec_S
73_deg_59_min_8,9988_sec_S
S_73_deg_59_min_8.9988_sec
S_73_deg_59_min_8,9988_sec
73_deg_59_min_8.9988_sec_South
73_deg_59_min_8,9988_sec_South
South_73_deg_59_min_8.9988_sec
South_73_deg_59_min_8,9988_sec
-73_deg_59_min_8.9988_sec
-73_deg_59_min_8,9988_sec

Possible notations so far: 70

LET US HAVE A LOOK AT THE FORMAT „DMS“

73° 59' 8.9988" S	73 degree 59 minutes 8.9988 seconds S	73 deg 59 min 8.9988 sec S	73_59_8.9988_S
73° 59' 8,9988" S	73 degree 59 minutes 8,9988 seconds S	73 deg 59 min 8,9988 sec S	73_59_8,9988_S
S 73° 59' 8.9988"	S 73 degree 59 minutes 8.9988 seconds	S 73 deg 59 min 8.9988 sec	S_73_59_8.9988
S 73° 59' 8,9988"	S 73 degree 59 minutes 8,9988 seconds	S 73 deg 59 min 8,9988 sec	S_73_59_8,9988
73° 59' 8.9988" South	73 degree 59 minutes 8.9988 seconds South	73 deg 59 min 8.9988 sec South	73_59_8.9988_South
73° 59' 8,9988" South	73 degree 59 minutes 8,9988 seconds South	73 deg 59 min 8,9988 sec South	73_59_8,9988_South
South 73° 59' 8.9988"	South 73 degree 59 minutes 8.9988 seconds	South 73 deg 59 min 8.9988 sec	South_73_59_8.9988
South 73° 59' 8,9988"	South 73 degree 59 minutes 8,9988 seconds	South 73 deg 59 min 8,9988 sec	South_73_59_8,9988
-73° 59' 8.9988"	-73 degree 59 minutes 8.9988 seconds	-73 deg 59 min 8.9988 sec	-73_59_8.9988
-73° 59' 8,9988"	-73 degree 59 minutes 8,9988 seconds	-73 deg 59 min 8,9988 sec	-73_59_8,9988
73°_59'_8.9988"_S	73_degree_59_minutes_8.9988_seconds_S	73_deg_59_min_8.9988_sec_S	
73°_59'_8,9988"_S	73_degree_59_minutes_8,9988_seconds_S	73_deg_59_min_8,9988_sec_S	
S_73°_59'_8.9988"	S_73_degree_59_minutes_8.9988_seconds	S_73_deg_59_min_8.9988_sec	
S_73°_59'_8,9988"	S_73_degree_59_minutes_8,9988_seconds	S_73_deg_59_min_8,9988_sec	
73°_59'_8.9988"_South	73_degree_59_minutes_8.9988_seconds_South	73_deg_59_min_8.9988_sec_South	
73°_59'_8,9988"_South	73_degree_59_minutes_8,9988_seconds_South	73_deg_59_min_8,9988_sec_South	
South_73°_59'_8.9988"	South_73_degree_59_minutes_8.9988_seconds	South_73_deg_59_min_8.9988_sec	
South_73°_59'_8,9988"	South_73_degree_59_minutes_8,9988_seconds	South_73_deg_59_min_8,9988_sec	
-73°_59'_8.9988"	-73_degree_59_minutes_8.9988_seconds	-73_deg_59_min_8.9988_sec	
-73°_59'_8,9988"	-73_degree_59_minutes_8,9988_seconds	-73_deg_59_min_8,9988_sec	

Possible notations so far: 70

These 70 different possible spellings of a degree indication for DMS alone did not take into account

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1. possible spelling mistakes (e.g. 'Souht' instead of 'South'),

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These 70 different possible spellings of a degree indication for DMS alone did not take into account

1. possible spelling mistakes (e.g. 'Souht' instead of 'South'),
2. missing symbols (e.g. missing degree sign '°'),
3. indications in other languages (e.g. 'Süd' instead of 'South'),
4. the use of other separators (e.g. '/' instead of '_') or
5. the simultaneous use of different separators (e.g. space and slash: $73^{\circ} 59' 8.9988'/S$).

Imagine receiving an Excel spreadsheet with data from

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Imagine receiving an Excel spreadsheet with data from

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- How can you quickly convert the different coordinate notations to decimal degrees?
- How can you quickly check that the data are correctly located?
- How can you quickly identify incorrect coordinate entries?

Here is the solution to this problems (at least for R users)

You can use the R package ,CoordFixR‘

[HP-AWI/CoordFixR: Coordinate Converter Web Application](#)