**The weather data which is used for the program is downloaded from National Climatic Data Center website.**

**Following is the format of data in the files, which was used to extract the data and emit in to restructured format.**

POS: 1-4

TOTAL-VARIABLE-CHARACTERS (this includes remarks, additional data, and element quality section)

The number of characters in the variable data section. The total record length = 105 + the value stored in this field.

DOM: A general domain comprised of the characters in the ASCII character set.

MIN: 0000 MAX: 9999

POS: 5-10

FIXED-WEATHER-STATION MASTER STATION CATALOG identifier

The identifier that represents a FIXED-WEATHER-STATION.

DOM: A general domain comprised of the characters in the ASCII character set.

COMMENT: This field includes all surface reporting stations, including ships, buoys, etc.

POS: 11-15

FIXED-WEATHER-STATION NCEI WBAN identifier

The identifier that represents a FIXED-WEATHER-STATION.

MIN: 00000 MAX: 99999

DOM: A general domain comprised of the numeric characters (0-9).

COMMENT: This field includes all surface reporting stations, including ships, buoys, etc.

POS: 16-23

GEOPHYSICAL-POINT-OBSERVATION date

The date of a GEOPHYSICAL-POINT-OBSERVATION.

MIN: 00000101 MAX: 99991231

DOM: A general domain comprised of integer values 0-9 in the format YYYYMMDD.

YYYY can be any positive integer value; MM is restricted to values 01-12; and DD is restricted

to values 01-31.

POS: 24-27

GEOPHYSICAL-POINT-OBSERVATION time

The time of a GEOPHYSICAL-POINT-OBSERVATION based on

Coordinated Universal Time Code (UTC).

MIN: 0000 MAX: 2359

DOM: A general domain comprised of integer values 0-9 in the format HHMM.

HH is restricted to values 00-23; MM is restricted to values 00-59.

POS: 28-28

GEOPHYSICAL-POINT-OBSERVATION data source flag

The flag of a GEOPHYSICAL-POINT-OBSERVATION showing the source or

combination of sources used in creating the observation.

POS: 29-34

GEOPHYSICAL-POINT-OBSERVATION latitude coordinate

The latitude coordinate of a GEOPHYSICAL-POINT-OBSERVATION where southern

hemisphere is negative.

MIN: -90000 MAX: +90000

UNITS: Angular Degrees

SCALING FACTOR: 1000

DOM: A general domain comprised of the numeric characters (0-9), a plus

sign (+), and a minus sign (-).

+99999 = Missing

POS: 35-41

GEOPHYSICAL-POINT-OBSERVATION longitude coordinate

The longitude coordinate of a GEOPHYSICAL-POINT-OBSERVATION where values west from

000000 to 179999 are signed negative.

MIN: -179999 MAX: +180000 UNITS: Angular Degrees

SCALING FACTOR: 1000

DOM: A general domain comprised of the numeric characters (0-9), a plus

sign (+), and a minus sign (-).

+999999 = Missing

POS: 42-46

GEOPHYSICAL-REPORT-TYPE code

The code that denotes the type of geophysical surface observation.

POS: 47-51

GEOPHYSICAL-POINT-OBSERVATION elevation dimension

The elevation of a GEOPHYSICAL-POINT-OBSERVATION relative to Mean Sea Level (MSL).

MIN: ‑0400 MAX: +8850 UNITS: Meters

SCALING FACTOR: 1

DOM: A general domain comprised of the numeric characters (0‑9), a minus

sign (‑), and a plus sign (+).

+9999 = Missing

POS: 52-56

FIXED-WEATHER-STATION call letter identifier

The identifier that represents the call letters assigned to a FIXED‑WEATHER‑STATION.

DOM: A general domain comprised of the characters in the ASCII character set.

99999 = Missing.

POS: 57-60

METEOROLOGICAL-POINT-OBSERVATION quality control process name

The name of the quality control process applied to a weather observation.

DOM: A general domain comprised of the ASCII character set.

**POS: 61-63**

**HUMIDITY**

The humidity in the air. Measured in percentage.

DOM: A general domain comprised of the numeric characters (0‑9).

999 = Missing. If type code (below) = V, then 999 indicates variable wind direction.

**POS: 64-64**

**WEATHER CONDITION**

The code that denotes a weather condition.

DOM: 1 - Sunny

**POS: 65-65**

**WIND-OBSERVATION type code**

The code that denotes the character of the WIND-OBSERVATION.

NOTE: If a value of 9 appears with a wind speed of 0000, this indicates calm winds.

**POS: 66-69**

**WIND-OBSERVATION speed rate**

The rate of horizontal travel of air past a fixed point.

MIN: 0000 MAX: 0900 UNITS: meters per second

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0‑9).

9999 = Missing.

**POS: 70-70**

**WIND‑OBSERVATION speed quality code**

The code that denotes a quality status of a reported WIND-OBSERVATION speed rate.

DOM: A specific domain comprised of the characters in the ASCII character set.

0 = Passed gross limits check

1 = Passed all quality control checks

2 = Suspect

3 = Erroneous

4 = Passed gross limits check , data originate from an NCEI data source

5 = Passed all quality control checks, data originate from an NCEI data source

6 = Suspect, data originate from an NCEI data source

7 = Erroneous, data originate from an NCEI data source

9 = Passed gross limits check if element is present

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**POS: 71-75**

**SKY-CONDITION-OBSERVATION ceiling height dimension**

The height above ground level (AGL) of the lowest cloud or obscuring phenomena layer aloft

with 5/8 or more summation total sky cover, which may be predominantly opaque, or the vertical

visibility into a surface‑based obstruction. Unlimited = 22000.

MIN: 00000 MAX: 22000 UNITS: Meters

SCALING FACTOR: 1

DOM: A general domain comprised of the numeric characters (0‑9).

99999 = Missing.

**POS: 76-76**

**SKY-CONDTION-OBSERVATION ceiling quality code**

The code that denotes a quality status of a reported ceiling height

dimension.

DOM: A specific domain comprised of the characters in the ASCII character set.

0 = Passed gross limits check

1 = Passed all quality control checks

2 = Suspect

3 = Erroneous

4 = Passed gross limits check , data originate from an NCEI data source

5 = Passed all quality control checks, data originate from an NCEI data source

6 = Suspect, data originate from an NCEI data source

7 = Erroneous, data originate from an NCEI data source

9 = Passed gross limits check if element is present

**POS: 77-77**

**SKY-CONDITION-OBSERVATION ceiling determination code**

The code that denotes the method used to determine the ceiling.

DOM: A specific domain comprised of the characters in the ASCII character set.

A: Aircraft

B: Balloon

C: Statistically derived

D: Persistent cirriform ceiling (pre-1950 data)

E: Estimated

M: Measured

P: Precipitation ceiling (pre-1950 data)

R: Radar

S: ASOS augmented

U: Unknown ceiling (pre-1950 data)

V: Variable ceiling (pre-1950 data)

W: Obscured

9: Missing

POS: 78-78

SKY-CONDITION-OBSERVATION CAVOK code

The code that represents whether the 'Ceiling And Visibility Okay' (CAVOK) condition has been

reported.

DOM: A specific domain comprised of the characters in the ASCII character set.

N: No

Y: Yes

9: missing

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**POS: 79-84**

**VISIBILITY-OBSERVATION distance dimension**

The horizontal distance at which an object can be seen and identified.

MIN: 000000 MAX: 160000 UNITS: Meters

DOM: A general domain comprised of the numeric characters (0‑9).

Missing = 999999

NOTE: Values greater than 160000 are entered as 160000

**POS: 85-85**

**VISIBILITY-OBSERVATION distance quality code**

The code that denotes a quality status of a reported distance of a visibility observation.

DOM: A specific domain comprised of the characters in the ASCII character set.

0 = Passed gross limits check

1 = Passed all quality control checks

2 = Suspect

3 = Erroneous

4 = Passed gross limits check , data originate from an NCEI data source

5 = Passed all quality control checks, data originate from an NCEI data source

6 = Suspect, data originate from an NCEI data source

7 = Erroneous, data originate from an NCEI data source

9 = Passed gross limits check if element is present

POS: 86-86

VISIBILITY-OBSERVATION variability code

The code that denotes whether or not the reported visibility is variable.

DOM: A specific domain comprised of the characters in the ASCII character set.

N: Not variable

V: Variable

9 = Missing

POS: 87-87

VISIBILITY-OBSERVATION quality variability code

The code that denotes a quality status of a reported VISIBILITY-OBSERVATION variability

code.

DOM: A specific domain comprised of the characters in the ASCII character set.

0 = Passed gross limits check

1 = Passed all quality control checks

2 = Suspect

3 = Erroneous

4 = Passed gross limits check , data originate from an NCEI data source

5 = Passed all quality control checks, data originate from an NCEI data source

6 = Suspect, data originate from an NCEI data source

7 = Erroneous, data originate from an NCEI data source

9 = Passed gross limits check if element is present

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**POS: 88-92**

**AIR-TEMPERATURE-OBSERVATION air temperature**

The temperature of the air.

MIN: ‑0932 MAX: +0618 UNITS: Degrees Celsius

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0‑9), a plus sign (+), and a minus

sign (‑).

+9999 = Missing.

**POS: 93-93**

**AIR-TEMPERATURE-OBSERVATION air temperature quality code**

The code that denotes a quality status of an AIR-TEMPERATURE-OBSERVATION.

DOM: A specific domain comprised of the characters in the ASCII character set.

0 = Passed gross limits check

1 = Passed all quality control checks

2 = Suspect

3 = Erroneous

4 = Passed gross limits check , data originate from an NCEI data source

5 = Passed all quality control checks, data originate from an NCEI data source

6 = Suspect, data originate from an NCEI data source

7 = Erroneous, data originate from an NCEI data source

9 = Passed gross limits check if element is present

A = Data value flagged as suspect, but accepted as a good value

C = Temperature and dew point received from Automated Weather Observing System (AWOS) are reported in whole degrees Celsius. Automated QC flags these values, but they are accepted as valid.

I = Data value not originally in data, but inserted by validator

M = Manual changes made to value based on information provided by NWS or FAA

P = Data value not originally flagged as suspect, but replaced by validator

R = Data value replaced with value computed by NCEI software

U = Data value replaced with edited value

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**POS: 94-98**

**AIR‑TEMPERATURE‑OBSERVATION dew point temperature**

The temperature to which a given parcel of air must be cooled at constant pressure and water vapor

content in order for saturation to occur.

MIN: -0982 MAX: +0368 UNITS: Degrees Celsius

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0‑9), a plus

sign (+), and a minus sign (‑).

+9999 = Missing.

**POS: 99-99**

**AIR‑TEMPERATURE‑OBSERVATION dew point quality code**

The code that denotes a quality status of the reported dew point temperature.

DOM: A specific domain comprised of the characters in the ASCII character set.

0 = Passed gross limits check

1 = Passed all quality control checks

2 = Suspect

3 = Erroneous

4 = Passed gross limits check , data originate from an NCEI data source

5 = Passed all quality control checks, data originate from an NCEI data source

6 = Suspect, data originate from an NCEI data source

7 = Erroneous, data originate from an NCEI data source

9 = Passed gross limits check if element is present

A = Data value flagged as suspect, but accepted as a good value

C = Temperature and dew point received from Automated Weather Observing System (AWOS) are reported in whole degrees Celsius. Automated QC flags these values, but they are accepted as valid.

I = Data value not originally in data, but inserted by validator

M = Manual changes made to value based on information provided by NWS or FAA

P = Data value not originally flagged as suspect, but replaced by validator

R = Data value replaced with value computed by NCEI software

U = Data value replaced with edited value

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**POS: 100-104**

**ATMOSPHERIC-PRESSURE-OBSERVATION sea level pressure**

The air pressure relative to Mean Sea Level (MSL).

MIN: 08600 MAX: 10900 UNITS: Hectopascals

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0‑9).

99999 = Missing.

**POS: 105-105**

**ATMOSPHERIC-PRESSURE-OBSERVATION sea level pressure quality code**

The code that denotes a quality status of the sea level pressure of an

ATMOSPHERIC-PRESSURE-OBSERVATION.

DOM: A specific domain comprised of the characters in the ASCII character set.

0 = Passed gross limits check

1 = Passed all quality control checks

2 = Suspect

3 = Erroneous

4 = Passed gross limits check , data originate from an NCEI data source

5 = Passed all quality control checks, data originate from an NCEI data source

6 = Suspect, data originate from an NCEI data source

7 = Erroneous, data originate from an NCEI data source

9 = Passed gross limits check if element is present

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**Additional Data Section**

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The data after 105 is additional data section which includes additional fields. As these details are irrevelant for the project, hence discarded.