VALIDATION OF SPECIESOBSERVATIONS

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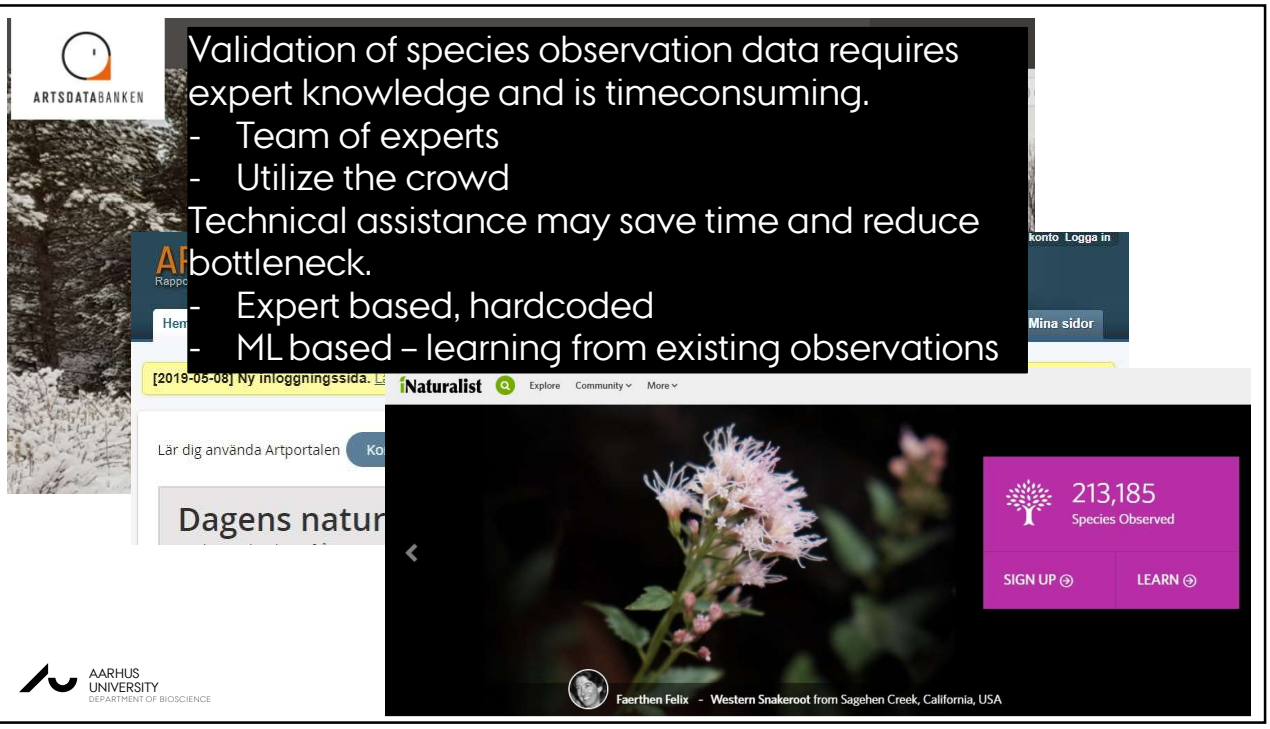
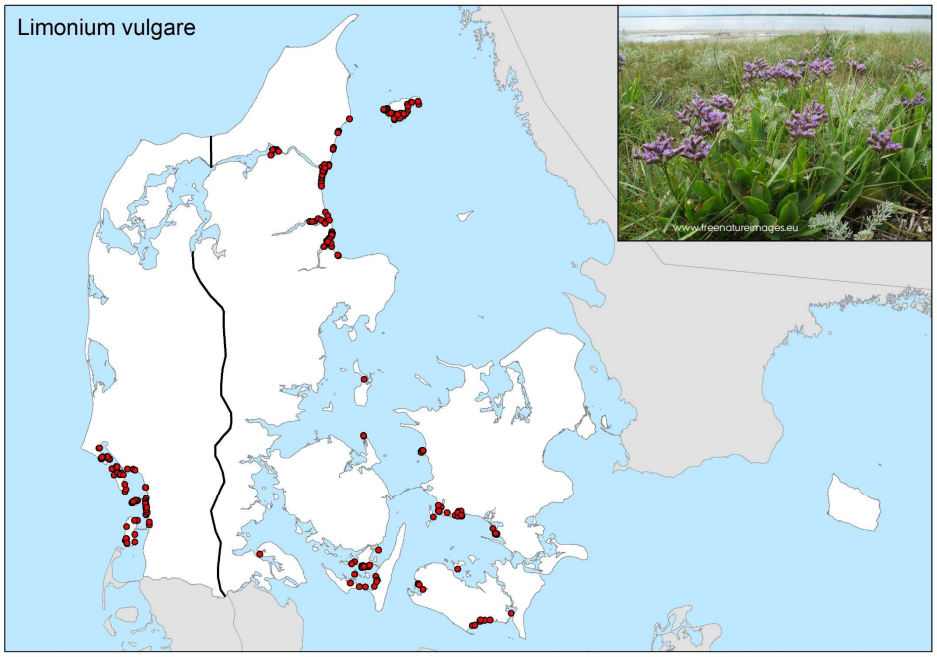


Mainly found on saltmarshes.



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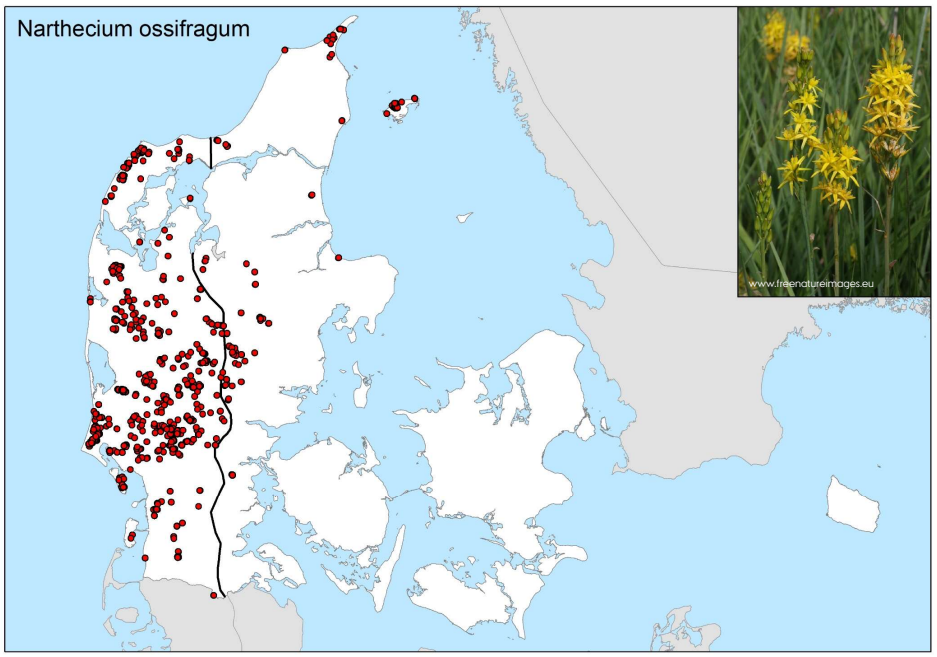
Mainly found on in bogs and wet heathland on poor, acidic soil in western parts of Denmark.



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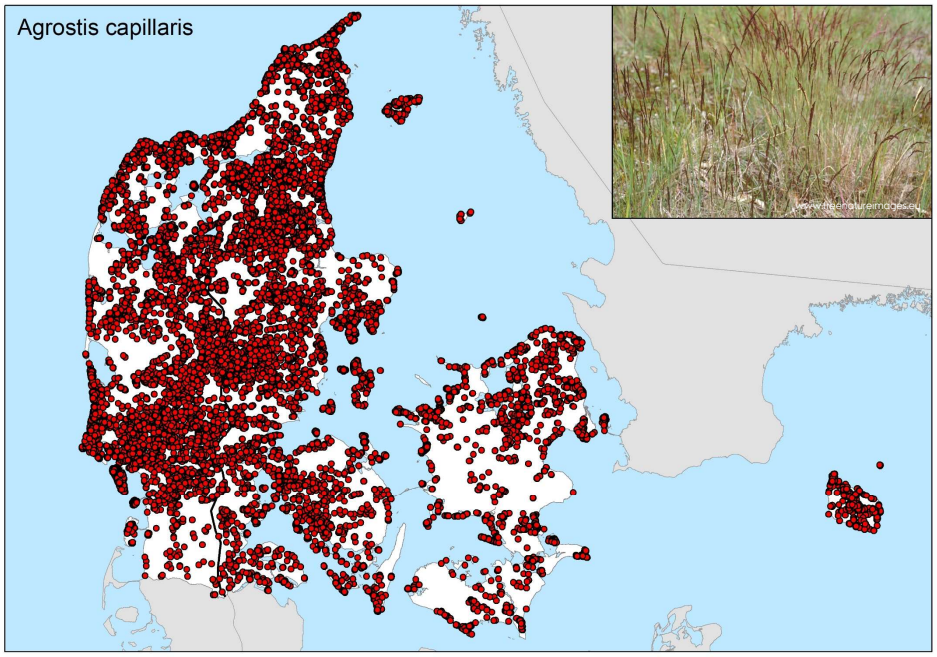
Common grass found in all of Denmark. Mainly dry conditions.



PROBLEM STATEMENT

Given some properties of one specific location, estimate the probability of one specific species existing in this location.

Input:

- known species occurrences, presence and sometimes absence.
- properties of locations

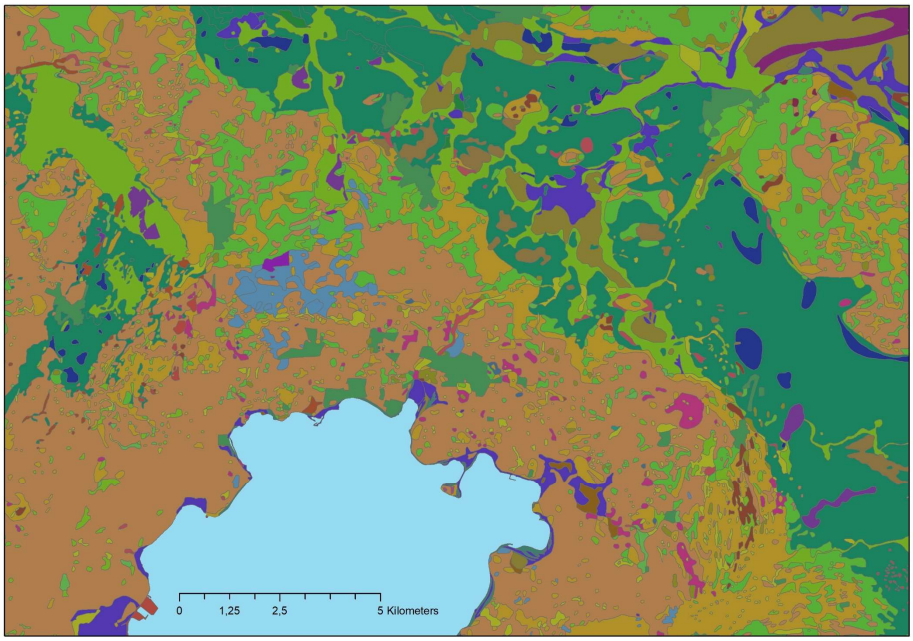
Species observations for database of Dansih authorities

Landuse/landcover propoerties and environmental properties.

Landcovertypes:

field
extensiveField
meadow
bog
saltmarsh
heathland
dryGrass
forest
lake
stream

Soiltypes of Denmark
- Sample and modelbased.



Soiltypes of Denmark
- Sample and modelbased.

Surface Geology Map of Denmark 1:25.000, version 4.

This digital geological map shows the surface geology in 1 meters depth, just beneath the ploughing- and culture layers. The map is a result of the systematic geological mapping of Denmark.This version 4 from 2015 classifies 88 % of Denmark's area.

Postglacial layers
FG - Freshwater gravel
FS - Freshwater sand
FI - Freshwater silt
FL - Freshwater clay
FP - Freshwater gyttja
FT - Freshwater peat
FV - Alternating thin freshwater beds
FK - Tufa, bog- and lake marl
FJ - Ocher and bog iron
FHG - Delta gravel
FHS - Delta sand
FHL - Delta clay
HG - Saltwater gravel
HS - Saltwater sand
HI - Saltwater silt
HL - Saltwater clay
HP - Saltwater gyttja
HT - Saltwater peat
HV - Alternating thin saltwater beds, marsh
HSG - Saltvands skalgrus
EK - Aeolian dune sand
ES - Aeolian sand
Lateglacial layers
TG - Meltwater gravel
TS - Meltwater sand
TI - Meltwater silt
TL - Meltwater clay
TV - Alternating thin meltwater beds
YG - Saltwater gravel
YS - Saltwater sand
YL - Saltwater clay
YP - Saltwater gyttja
Marginal glaciale lag
ZG - Glaciolacustrine gravel
ZS - Glaciolacustrine sand
ZL - Glaciolacustrine clay
ZV - Alternating thin glaciolacustrine beds
Glacial layers
DG - Meltwater gravel
DS - Meltwater sand
DI - Meltwater silt
DL - Meltwater clay
DV - Alternating thin meltwater beds
MG - Gravelly till
MS - Sandy till
MI - Silty till
ML - Clayey till
MV - Alternating thin till beds
KMG - Limey till, gravelly
KMS - Limey till, sandy
KML - Limey till, clayey
Interglacial layers
Interglacial layers
QG - Saltwater gravel
QS - Saltwater sand
QL - Saltwater clay
Other layers
BY - Town
SØ - Freshwater
HAV - Sea
TA - Technical and artificial construction
RÅ - Pit
LRÅ - Abandoned pit
LSL - Landslide
O - Rubbish dump
X - Bed unkown, no infomation
IA - No access
Other layers (alphabetic)
BK - Danian bryozoan og corallian limestone
ED - Eocene diatomite
EE - Eocene vulcanic ash
G - Gravel / sand and gravel
GC - Oligocene/miocene/pliocene brown coal
GL - Oligocene/miocene/pliocene mica clay
GS - Oligocene/miocene/pliocene mica sand
GV- Oligocæn/miocæn/pliocæn alternating layers
K - Chalk and limestone
KS - Miocene quartz sand
LL - Eocene clay, plastic clay
OL - Oligocene clay
PKV - Pre-Quarternary layers
PL - Selandian clay, paleocene clay
PS - Selandian sand, paleocene greensand
RL - Eocene Røsnæs clay
S - Sand
SK - Campanien-maastrichtien skrivekridt
SL - Eocene Søvind marl
ZK - Danien chalk / chalk and flint

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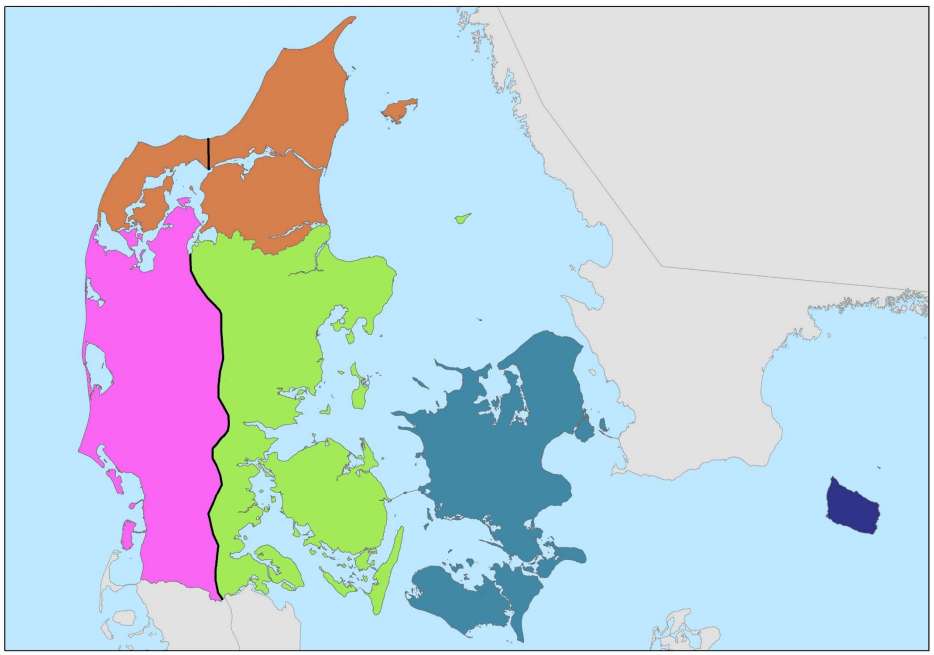
Atlantic and continental biogeographic regions of Denmark.

5 regions often used in policy reporting.



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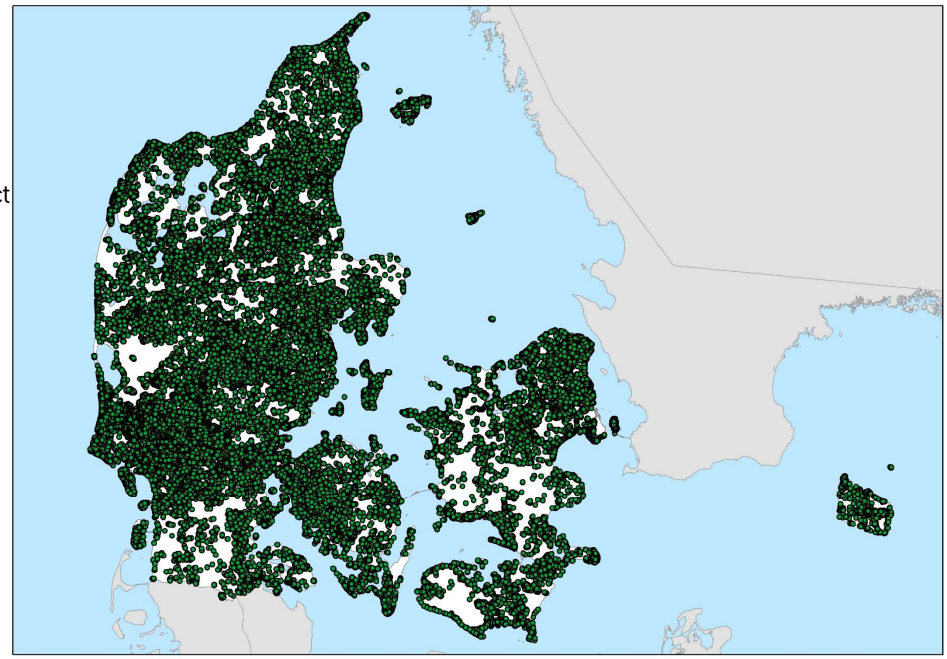
All localities, Used to select 'pseudo-absences'.

133.000 localities



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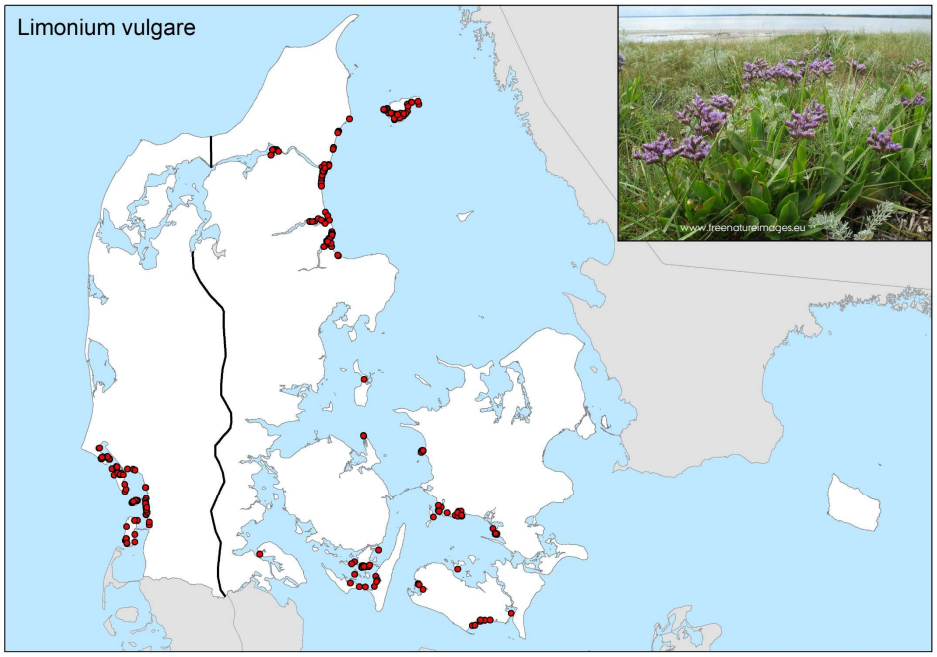
Sample properties for know occurrences.



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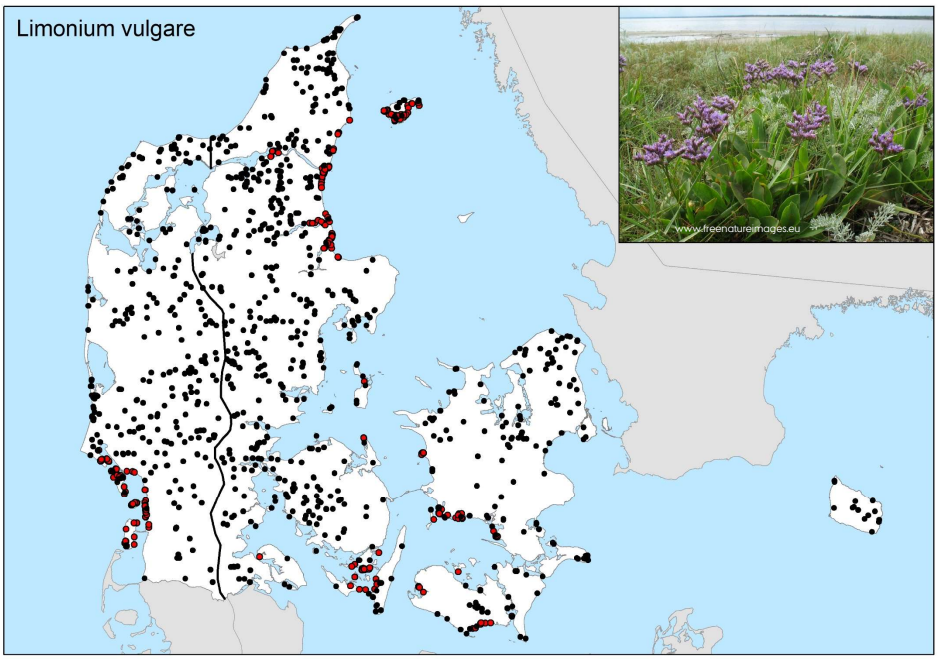
Sample properties for know occurrences

AND for pseudo-absences.



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PROPERTIES OF THE GIVEN LOCATION

- polyTypeId: ‘0’, ‘1’, ‘2’, ‘3’, ‘4’, ‘5’, ‘6’, ‘7’, ‘8’, ‘9’, ‘’
  - *meadow, heathland, bog, dryGrass, forest, lake, saltmarsh, stream, extensiveField, field*
- regionId: ‘1’, ‘2’, ‘3’, ‘4’, ‘5’
  - *NordJyl, VestJyl, OestJylFyn, SjLolFal, Bornholm*
- Bioreg: ‘CON’, ‘ALT’
- soilType:
  'DL','DSG','ED','EQ','ES','F','FYLD','GC','GL','GNG','GS','HAG','HG','HSL','HV','JV','KQ','KS','LL','ML','MSG','PAM','PL','ROG','SK','SO','SVG','T','VAG','Y','ZK',''
- distCoast: min = 0, max = 48991
- x_int: min = 441994, max = 892641
- y_int: min = 6050562, max = 6402150

PROPERTIES OF THE GIVEN LOCATION

OBJECTID;polyType;polyTypeId;regionName;regionId;bioreg;soilType;distCoast;x_int;y_int
1;saltmarsh;6;OestJylFyn;3;CON;HSL;200.0000000;583100;6278030
2;saltmarsh;6;NordJyl;1;CON;HSL;0.0000000;578370;6314280
3;saltmarsh;6;OestJylFyn;3;CON;HSL;0.0000000;601320;6090460
4;saltmarsh;6;OestJylFyn;3;CON;HSL;100.0000000;600240;6090210
5;saltmarsh;6;VestJyl;2;ATL;HSL;282.8427124;470900;6126590
6;saltmarsh;6;VestJyl;2;ATL;HSL;707.1068115;453440;6151850
7;saltmarsh;6;VestJyl;2;ATL;HSL;282.8427124;453750;6152190
8;saltmarsh;6;SjLolFal;4;CON;HSL;100.0000000;643090;6121720
9;saltmarsh;6;NordJyl;1;CON;HSL;100.0000000;577970;6313560
10;saltmarsh;6;OestJylFyn;3;CON;HSL;316.2277527;600660;6090960

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PROBLEM STATEMENT

Given some properties of one specific location, estimate the probability of one specific species existing in this location.

Input:

- known species occurrences, presence and 'absence'.
- properties of locations
  - First example:
  - Limonium Vulgare
  - 559 positive data points (first 459 for training and the rest 100 for testing)
    - Limonium_vulgare.txt
  - 559 negative data points (first 459 for training and the rest 100 for testing)
    - Limonium_vulgare_neg.txt

HINTS FOR THE EXERCISE

1. Treat he problem as a binary classification task

2. Procedures:
   - Read the two txt files, convert the 7 different properties in each line into a feature vector with 7 elements. The value of each element should range from 0 to 1.
   - Define the neural network.
   - Train the network using 459 positive feature vectors and 459 negative feature vectors.
   - Test the network using 100 positive and 100 negative feature vectors.


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