

# Lesson 4: Dive into Tidy: Data Wrangling and Manipulation Part 2

## - Homework Answers

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### Contents

1	Are there any duplicate <code>tree_id</code> rows?	2
2	How many trees of each species are there?	2
3	How old is the oldest tree in the data set, in years?	14
4	How many trees are planted by year?	14
5	How many are planted by decade?	15
6	Or...	16

## Answers to Questions:

First, load your libraries!

```
library(tidyverse)
library(lubridate)
library(tidyuesdayR)
```

Use tree\_dat for the following questions:

```
trees <- tidyuesdayR::tt_load('2020-01-28')
```

```
##
## Downloading file 1 of 2: 'sf_trees.csv'
## Downloading file 2 of 2: 'Street_Tree_Map.csv'

## Warning: 952155 parsing failures.
##   row      col      expected      actual      file
## 2670 XCoord  1/0/T/F/TRUE/FALSE 6005345.6576 <raw vector>
## 2670 YCoord  1/0/T/F/TRUE/FALSE 2111619.4154 <raw vector>
## 2670 Latitude 1/0/T/F/TRUE/FALSE 37.7784066780298 <raw vector>
## 2670 Longitude 1/0/T/F/TRUE/FALSE -122.425067563729 <raw vector>
## 2670 Location 1/0/T/F/TRUE/FALSE (37.7784066780298, -122.425067563729) <raw vector>
## ....
## See problems(...) for more details.
```

```
trees
tree_dat <- trees$sf_trees
```

## 1 Are there any duplicate tree\_id rows?

```
length(unique(tree_dat$tree_id))
```

```
## [1] 192987
```

```
# # 192987 matches number of rows in data set- no duplicates
```

## 2 How many trees of each species are there?

```
tree_dat %>%
  group_by(species) %>%
  summarise(num_trees = n())
```

species	num_trees
::	1839
Abutilon hybridum :: Flowering maple	5
Acacia baileyana 'Purpurea' :: Purple-leaf Acacia	26
Acacia baileyana :: Bailey's Acacia	834
Acacia cognata :: River Wattle	28
Acacia cyclops :: Cyclops wattle	16
Acacia dealbata :: Silver Wattle	4
Acacia decurrens :: Acacia: Silver Wattle	42
Acacia iteaphylla :: Willow wattle	2
Acacia longifolia :: Golden Wattle	180
Acacia melanoxylon :: Blackwood Acacia	3956
Acacia spp :: Acacia Spp	107
Acacia stenophylla :: Shoestring Acacia	326
Acacia vestita :: Hairy wattle	3
Acca sellowiana :: Pineapple Guava Tree	5
Acer buergeranum :: Trident Maple	395
Acer campestre :: Hedge Maple	1
Acer circinatum :: Vine Maple	5
Acer ginnela :: Amur Maple	1
Acer japonicum :: Japanese Maple	30
Acer macrophyllum :: Big Leaf Maple	34
Acer negundo :: Box Elder	4
Acer palmatum 'Bloodgood' :: Bloodgood Japanese Maple	31
Acer palmatum 'Sango Kaku' :: Coral Bark Maple	2
Acer palmatum :: Japanese Maple	412
Acer paxii :: Evergreen Maple	1
Acer platanoides 'Crimson King' :: Norway maple	1
Acer platanoides :: Norway Maple	1
Acer pseudoplatanus :: Sycamore Maple	5
Acer rubrum 'Armstrong' :: Armstrong Red Maple	81
Acer rubrum 'Autumn Glory' :: Red Maple Tree 'Autumn Glory'	2
Acer rubrum 'October Glory' :: Red October Glory Maple	38
Acer rubrum 'Red Sunset' :: Red Swamp Maple	106
Acer rubrum :: Red Maple	890
Acer saccharinum :: Silver Maple	80
Acer saccharum :: Sugar Maple	1
Acer spp :: Maple	29
Acer tegmentosum :: Manchurian snakebark maple	1
Acer x 'Autumn Blaze' :: Hybrid Maple	1
Acer x freemanii 'Autumn Blaze' :: Autumn Blaze Freeman Maple	4
Acer x freemanii :: Freeman Maple	160
Aesculus californica :: California Buckeye	74
Aesculus hippocastanum :: White Horsechestnut	13
Aesculus spp :: Horsechestnut	1
Aesculus x carnea 'Briotii' :: Ruby Horse Chestnut	19
Aesculus x carnea 'O'Neill' :: O'Neill Red Horse Chestnut	3
Aesculus x carnea :: Red Horse Chestnut	116
Afrocarpus gracilior :: Fern Pine	665
Agonis flexuosa 'After Dark' :: Peppermint willow 'After Dark'	155
Agonis flexuosa :: Peppermint Willow	913
Ailanthus altissima :: Tree Of Heaven	10
Albizia distachya :: Plume Albizia Tree	13

species	num_trees
Albizia julibrissin :: Mimosa Silk Tree	64
Alnus cordata :: Italian Alder	23
Alnus rhombifolia :: White Alder	53
Alnus rubra :: Red Alder	1
Aloe barberae :: Tree aloe	10
Angohpora spp. :: Angophora species	2
Araucaria araucana :: Monkey puzzle	16
Araucaria bidwillii :: Bunya Bunya	1
Araucaria columnaris :: Coral reef araucaria	39
Araucaria heterophylla :: Norfolk Island Pine	60
Arbutus 'Marina' :: Hybrid Strawberry Tree	5702
Arbutus menziesii :: Pacific Madrone	2
Arbutus unedo 'Compacta' :: Dwarf strawberry tree	3
Arbutus unedo :: Strawberry Tree	632
Archontophoenix cunninghamiana :: King Palm	23
Archontophoenix myolensis :: Myola palm	6
Arctostaphylos manzanita 'Dr Hurd' :: Dr. Hurd Manzanita	5
Arecastrum romanzoffianum :: Queen Palm	130
Auranticarpa rhombifolia :: Queensland Pittosporum	6
Azara microphylla :: Little-Leaf Azara	52
Bambusa spp :: Bamboo Species	23
Banksia integrifolia :: Coast Banksia	15
Beaucarnea recurvata :: Ponytail palm	3
Betula nigra :: River Birch	19
Betula pendula :: European White Birch	161
Betula spp :: Birch	78
Brachychiton acerifolius :: Australian Flame Tree	9
Brachychiton discolor ::	2
Brachychiton populneus :: Bottle Tree	14
Brachychiton rupestris :: Narrow-leaf bottle tree	2
Brahea aramata :: Mexican Blue Palm	8
Brahea armata :: Blue hesper palm	2
Brahea brandegeei :: San Jose hesper palm	1
Brahea edulis :: Guadalupe Palm	108
Brugmansia spp :: Angel trumpet	87
Butia capitata :: Pindo Palm	5
Callistemon 'Jeffers' :: Purple bottlebrush	4
Callistemon citrinus :: Lemon Bottlebrush	3266
Callistemon salignus :: White flowering bottlebrush	1
Callistemon viminalis :: Weeping Bottlebrush	950
Calocedrus decurrens :: Incense Cedar	57
Carpinus betulus 'Fastigiata' :: Upright European Hornbeam	13
Carpinus betulus :: European Hornbeam	74
Carya illinoensis :: Pecan	1
Caryota maxima 'Himalaya' :: Himalayan Fishtail Palm	4
Cassia leptophylla :: Gold Medallion Tree	40
Castanea dentata :: American Chestnut	1
Casuarina cunninghamiana :: Horsetail pine	57
Casuarina stricta :: Beefwood: Drooping She-Oak	33
Catalpa speciosa :: Northern Catalpa	1
Ceanothus 'Ray Hartman' :: California Lilac 'Ray Hartman'	314
Ceanothus Sps :: California lilac	141

species	num_trees
Ceanothus thyrsiflorus :: Blueblossom Ceanothus	2
Cedrela fissilis :: Argentine cedar	1
Cedrus atlantica :: Atlas Cedar	57
Cedrus atlantica Glauca :: Blue Atlas Cedar	12
Cedrus deodara :: Deodar Cedar	154
Cedrus libani :: Lebanon cedar	1
Ceiba speciosa :: Silk floss	91
Celtis australis :: European Hackberry	23
Celtis occidentalis :: Common Hackberry	30
Celtis sinensis :: Chinese Hackberry	222
Ceratonia siliqua :: Carob	855
Cercidiphyllum japonicum :: Katsura tree	1
Cercis canadensis ‘Forest Pansy’ :: Forest Pansy Redbud	24
Cercis canadensis :: Eastern Redbud	47
Cercis occidentalis :: Western Redbud	82
Cercocarpus betuloides :: Mountain mahogany	1
Chamaecyparis lawsoniana :: Port Orford Cedar	4
Chamaecyparis obtusa :: Hinoki cypress	4
Chamaecyparis species ::	6
Chamaerops humilis :: Mediterranean Fan Palm	210
Chionanthus retusa :: Chinese Fringe Tree	5
Chiranthodendron pentadactylon :: Monkey Hand Tree	6
Chitalpa tashkentensis ::	17
Chorisia speciosa :: Silk Floss Tree	3
Cinnamomum camphora :: Camphor Tree	139
Citrus × limon ‘Lisbon’ :: Lisbon Lemon Tree	2
Citrus × meyeri ‘Improved’ :: Improved Meyer Lemon	14
Citrus aurantifolia ‘Bearss’ :: Seedless Lime	10
Citrus spp :: Lemon: Orange: Lime	143
Citrus x hystrix :: Kaffir lime	1
Cordyline australis :: Dracena Palm	1640
Cornus florida :: Eastern Dogwood	13
Cornus nuttallii x florida ‘Eddie’s White Wonder’ :: Eddie’s White Wonder Dogwood	6
Cornus SPP :: Dogwood	9
Corylus colurna :: Hazel: Turkish	2
Corymbia calophylla ::	11
Corymbia citriodora :: Lemon Scented Gum	31
Corymbia ficifolia :: Red Flowering Gum	3575
Corymbia maculata :: Spotted Gum	97
Corynocarpus laevigata :: New Zealand Laurel	3
Cotinus coggygria ‘Royal Purple’ :: Smoke tree	16
Cotoneaster SPP :: Cotoneaster	160
Crataegus laevigata ‘Paul’s Scarlet’ :: Paul’s Scarlet Hawthorn	4
Crataegus laevigata :: English Hawthorn	492
Crataegus phaenopyrum :: Washington Hawthorn	708
Crataegus spp :: Hawthorn	84
Crinodendron patagua :: Lily-of-the-Valley Tree	1
Cryptomeria japonica :: Japanese Cryptomeria	12
Cupaniopsis anacardioides :: Carrotwood	251
Cupressocyparis leylandii :: Leyland Cypress	151
Cupressus arizonica :: Arizona Cypress	12
Cupressus macrocarpa :: Monterey Cypress	1922

species	num_trees
Cupressus sempervirens :: Italian Cypress	176
Cupressus spp :: Cypress species	1
Cussonia spicata :: Cabbage tree	19
Cycas revoluta :: Sago palm	2
Dicksonia antarctica :: Soft Tree Fern	20
Diospyros kaki :: Persimmon	5
Dodonaea viscosa ‘Purpurea’ :: Purple Hopseed Bush	368
Dodonaea viscosa :: Hop Bush	400
Dracaena draco :: Dragon Tree	43
Dypsis cabadae :: Cabada palm	12
Dypsis decaryi :: Triangle palm	1
Elaeocarpus decipiens :: Japanese Blueberry Tree	75
Eriobotrya deflexa ‘Coppertone’ :: Coppertone Loquat	54
Eriobotrya deflexa :: Bronze Loquat	2402
Eriobotrya japonica :: Edible Loquat	183
Erythrina caffra :: Coral tree	2
Escallonia bifida :: White escallonia	4
Eucalyptus camaldulensis :: River Red Gum	85
Eucalyptus cinerea :: Ash-colored Eucalyptus	12
Eucalyptus citriodora :: Lemon scented eucalyptus	2
Eucalyptus globulus :: Blue Gum	497
Eucalyptus gunnii :: Cider Gum	2
Eucalyptus lehmanni :: Bushy Yate	92
Eucalyptus leucoxylon mac ‘Rosea’ :: Yellow Gum	45
Eucalyptus longifolia :: Woollybutt	3
Eucalyptus macarthurii :: Camden Wollybutt	4
Eucalyptus melliodora :: Yellow Box	13
Eucalyptus microtheca :: Flooded Box: Coolibah	15
Eucalyptus nicholii :: Nichol’s Willow-Leafed Peppermint	200
Eucalyptus odorata :: Peppermint Box	2
Eucalyptus polyanthemos :: Silver Dollar Eucalyptus	1005
Eucalyptus pulverulenta :: Silver Mountain Gum Tree	23
Eucalyptus robusta :: Swamp mahogany	22
Eucalyptus rudis :: Swamp Gum: Flooded Gum	12
Eucalyptus saligna :: Sidney Blue Gum	5
Eucalyptus sideroxylon :: Red Ironbark	718
Eucalyptus simmondsii :: Simmond’s Peppermint	2
Eucalyptus Spp :: Eucalyptus	551
Eucalyptus torquata :: Coral Gum	2
Eucalyptus viminalis :: Manna Gum	26
Euphorbia ingens :: Candelabra tree	1
Fagus sylvatica ‘Red Obelisk’ :: Red Obelisk Beech	1
Fagus sylvatica :: European Beech	21
Ficus carica ‘Black Mission’ :: Black Mission Fig	2
Ficus carica ‘Brown Turkey’ :: Brown Turkey Fig	1
Ficus carica :: Edible Fig	53
Ficus laurel ::	19
Ficus macrophylla :: Morton Bay Fig	27
Ficus microcarpa ‘Retusa’ :: Pot Belly Fig	7
Ficus microcarpa :: Chinese Banyan	966
Ficus microcarpa nitida ‘Green Gem’ :: Indian Laurel Fig Tree ‘Green Gem’	5624
Ficus nitida :: Laurel Fig	1632

species	num_trees
<i>Ficus retusa nitida</i> :: Banyan Fig	1387
<i>Ficus rubiginosa</i> :: Port Jackson Fig	37
<i>Ficus</i> Spp. ::	76
<i>Fortunella margarita</i> :: Kumquat	4
<i>Fraxinus americana</i> ‘Autumn Purple’ :: American Autumn Purple Ash	40
<i>Fraxinus americana</i> :: American Ash	91
<i>Fraxinus angustifolia</i> :: Narrow-leaved Ash	6
<i>Fraxinus holotricha</i> :: Holotricha Ash	5
<i>Fraxinus ornus</i> :: Flowering Ash	10
<i>Fraxinus oxycarpa</i> ‘Raywood’ :: Raywood Ash	276
<i>Fraxinus oxycarpa</i> :: Ash	100
<i>Fraxinus</i> spp :: Ash Spp	332
<i>Fraxinus uhdei</i> ‘Tomlinson’ :: Tomlinson Ash	2
<i>Fraxinus uhdei</i> :: Shamel Ash: Evergreen Ash	557
<i>Fraxinus velutina</i> ‘Glabra’ :: Arizona Ash	12
<i>Fraxinus velutina</i> ‘Modesto’ :: Modesto Ash Tree ‘Modesto’	1
<i>Fraxinus velutina</i> :: Modesto Ash	3
<i>Fraxinus</i> x <i>Moraine</i> :: Moraine Ash	20
<i>Fremontodendron</i> spp :: Flannel Bush Tree	22
<i>Garrya elliptica</i> ‘Evie’ :: Evie Coast Silktassel Tree	4
<i>Garrya elliptica</i> ‘James Roof’ :: James Roof Coast Silktassel Tree	3
<i>Geijera parviflora</i> :: Australian Willow	487
<i>Geijera</i> spp :: Geijera	1
<i>Ginkgo biloba</i> ‘Autumn Gold’ :: Ginkgo: Autumn Gold	159
<i>Ginkgo biloba</i> ‘Autumn Sentinel’ :: Autumn Sentinel Ginkgo	8
<i>Ginkgo biloba</i> ‘Fairmont’ :: Fairmont Ginkgo	42
<i>Ginkgo biloba</i> ‘Princeton Sentry’ :: Princeton Sentry Maidenhair	38
<i>Ginkgo biloba</i> ‘Saratoga’ :: Ginkgo: Saratoga	14
<i>Ginkgo biloba</i> :: Maidenhair Tree	3212
<i>Gleditsia triacanthos</i> ‘Aurea’ :: Honey Locust ‘Aurea’	2
<i>Gleditsia triacanthos</i> ‘Shademaster’ :: Honey Locust ‘Shademaster’	10
<i>Gleditsia triacanthos</i> ‘Sunburst’ :: Sunburst Honey Locust	7
<i>Gleditsia triacanthos</i> :: Honey Locust	99
<i>Grevillea</i> ‘Red Hooks’ :: Silk Oak Tree ‘Red Hooks’	10
<i>Grevillea robusta</i> :: Silk Oak Tree	97
<i>Grevillea</i> spp :: Silkoak species	9
<i>Griselinia lucida</i> :: Griselinia	9
<i>Hakea laurina</i> :: Sea Urchin Tree	9
<i>Hakea suaveolens</i> :: Sweet Hakea Tree	86
<i>Heteromeles arbutifolia</i> :: Toyon	67
<i>Howea forsteriana</i> :: Kentia Palm	13
<i>Hymenosporum flavum</i> :: Sweet Shade	140
<i>Hymenosporum flavum</i> :: Sweetshade	14
<i>Ilex altaclarensis</i> ‘Wilsonii’ :: Wilson Holly Tree	58
<i>Ilex aquifolium</i> :: European Holly	61
<i>Ilex opaca</i> :: American Holly	3
<i>Ilex</i> spp :: Holly Species	60
<i>Jacaranda mimosifolia</i> :: Jacaranda	1170
<i>Jubaea chilensis</i> :: Chilean Wine Palm	6
<i>Juglans</i> ‘Paradox’ :: Paradox Walnut Tree ‘Paradox’	2
<i>Juglans californica</i> :: Walnut: Black (s.calif)	6
<i>Juglans hindsii</i> :: Walnut: Black (n.calif)	4

species	num_trees
Juglans nigra :: Eastern black walnut	9
Juglans regia :: Walnut: English	12
Juniperus californica :: California juniper	8
Juniperus chinensis :: Juniper	1404
Juniperus scopulorum 'Pat' :: Juniper Tree 'Pathfinder'	1
Juniperus silicicola :: Southern red cedar	4
Koelreuteria bipinnata :: Chinese Flame Tree	45
Koelreuteria paniculata :: Golden Rain Tree	260
Lagerstroemia indica 'Natchez' :: Natchez Crape Myrtle	2
Lagerstroemia indica 'Tuscarora' :: Tuscarora Crape Myrtle	1
Lagerstroemia indica :: Crape Myrtle	99
Lagerstroemia spp :: Crape myrtle species	1
Lagerstroemia x 'Tuscarora' :: Tuscarora Crape Myrtle	1
Lagunaria patersonii :: Primrose Tree	1077
Laurus nobilis :: Sweet Bay: Grecian Laurel	855
Laurus x 'Saratoga' :: Hybrid Laurel	47
Leptospermum laevigatum :: Australian Tea Tree	406
Leptospermum petersonii :: Lemon Scented Tea Tree	7
Leptospermum quinquenervia :: Tea Tree	3
Leptospermum scoparium 'Ruby Glow' :: New Zealand Ruby Glow Tea Tree	131
Leptospermum scoparium 'Snow White' :: New Zealand White Tea Tree	7
Leptospermum scoparium 'Helene Strybing' :: Helene Strybing New Zealand Tea Tree	51
Leptospermum scoparium :: New Zealand Tea Tree	504
Leucadendron 'Gold Strike' :: Yellow conebrush	4
Leucodendron argenteum :: Silver Tree	5
Ligustrum japonicum :: Japanese Privet	168
Ligustrum lucidum :: Glossy Privet	2185
Ligustrum ovalifolium :: California privet	16
Liquidambar formosana :: Chinese Sweet Gum	2
Liquidambar orientalis :: Oriental Sweet Gum	90
Liquidambar styraciflua 'Burgundy' :: Burgundy Sweet Gum	2
Liquidambar styraciflua 'Festival' :: Festival Sweet Gum	3
Liquidambar styraciflua 'Palo Alto' :: Palo Alto Sweet Gum	13
Liquidambar styraciflua 'Rotundiloba' :: Roundleaf sweetgum	72
Liquidambar styraciflua 'Slender Silhouette' :: Upright Liquidambar	1
Liquidambar styraciflua :: American Sweet Gum	1520
Liriodendron tulipifera :: Tulip Tree	320
Lithocarpus densiflorus :: Tan Oak	2
Livistona chinensis :: Chinese fan palm	1
Lophostemon confertus :: Brisbane Box	8581
Lyonothamnus floribundus subsp. asplenifolius :: Santa Cruz Ironwood	548
Macadamia tetraphylla :: Macadamia	1
Magnolia champaca :: Champa	89
Magnolia doltsopa 'Silvercloud' :: Silvercloud Magnolia	2
Magnolia doltsopa :: Himalayan Magnolia	242
Magnolia grandiflora 'D.D. Blanchard' :: D.D. Blanchard Southern Magnolia	24
Magnolia grandiflora 'Little Gem' :: Little Gem Magnolia	935
Magnolia grandiflora 'Majestic Beauty' :: Majestic Beauty Magnolia	49
Magnolia grandiflora 'Russet' :: Russet Magnolia	147
Magnolia grandiflora 'Saint Mary' :: Saint Mary Magnolia	296
Magnolia grandiflora 'Samuel Sommer' :: Samuel Sommer Magnolia	380
Magnolia grandiflora 'Timeless Beauty' :: Timeless Beauty Southern Magnolia	1



species	num_trees
Magnolia grandiflora :: Southern Magnolia	6285
Magnolia sargentiana ‘Robusta’ :: Robusta Magnolia	3
Magnolia spp :: Magnolia	92
Magnolia x alba :: White Champaca	7
Magnolia x foggii ‘Jack Fogg’ :: Jack Fogg Michelia	3
Magnolia x soulangiana ‘Rustica Rubra’ :: Chinese Magnolia	2
Magnolia x soulangiana :: Saucer Magnolia	76
Malus ‘Fuji’ :: Fuji Apple Tree ‘Fuji’	1
Malus ‘Gala’ :: Apple Tree ‘Gala’	4
Malus :: Crab Apple	121
Malus floribunda ‘Prairie Fire’ :: Prairie Fire Crabapple Tree	4
Malus floribunda :: Showy Crab Apple: Japanese Crabapple	142
Malus sylvestris :: Apple	4
Malus x ‘Callaway’ :: White-Flowered Crabapple	9
Mangifera indica :: Mango	1
Maytenus boaria :: Mayten	3899
Melaleuca ericifolia :: Heath Melaleuca	258
Melaleuca leucadendron :: Weeping Tea Tree	1
Melaleuca linariifolia :: Flaxleaf Paperbark	357
Melaleuca nesophila :: Pink Melaleuca	144
Melaleuca quinquenervia :: Cajeput	1736
Melaleuca spp :: Melaleuca spp	57
Melaleuca styphelioides :: Paperbark Tree	97
Melia azerdarach :: Chinaberry	4
Meryta sinclairii :: Puka or puke tree	2
Metasequoia glyptostroboides :: Dawn Redwood	15
Metrosideros excelsa ‘Aurea’ ::	4
Metrosideros excelsa :: New Zealand Xmas Tree	8744
Metrosideros robusta :: Northern Rata Tree	1
Metrosideros spp ::	2
Moringa oleifera :: Drumstick tree	1
Morus alba :: White Mulberry	94
Morus rubra :: Red mulberry	2
Musa spp :: Banana	13
Myoporum laetum :: Myoporum	1590
Myrica californica :: Pacific Wax Myrtle Tree	1
Nerium oleander :: Oleander	40
New Zealand Tea Tree :: New Zealand Tea Tree	7
Nyssa sylvatica :: Tupelo: Sour Gum	23
Olea europaea ‘Fruitless’ :: Fruitless Olive	249
Olea europaea ‘Majestic Beauty’ :: Majestic Beauty Fruitless Olive	57
Olea europaea ‘Swan Hill’ :: Olive	13
Olea europaea ‘Wilsonii’ :: Wilson Olive Semi-fruitless	126
Olea europaea :: Olive Tree	3694
Olea Majestic Beauty ::	81
Palm (unknown Genus) :: Palm Spp	46
Paulownia fortunei :: Dragon tree	3
Paulownia tomentosa :: Empress Tree	2
Persea americana ‘Stewart’ :: Stewart Avocado	1
Persea americana :: Avocado	81
Persea borbonia :: False Avocado	8
Persea indica :: Indian Bay	17

species	num_trees
Phoenix canariensis :: Canary Island Date Palm	893
Phoenix dactylifera :: Date Palm	58
Phoenix reclinata :: Senegal date palm	3
Phoenix roebelenii :: Pigmy Date Palm	8
Phoenix rupicola :: Cliff date palm	1
Phoenix spp :: Date palm (species unknown)	6
Photinia fraseri :: Photinia Tree	136
Photinia fraseri :: Photinia: Chinese photinia	332
Picea Spp :: Spruce Spp	31
Pinus canariensis :: Canary Island Pine	393
Pinus contorta :: Shore Pine	2
Pinus coulteri :: Coulter pine	4
Pinus halepensis :: Aleppo Pine	27
Pinus muricata :: Bishop Pine	21
Pinus pinaster :: Maritime Pine	1
Pinus pinea :: Italian Stone Pine	428
Pinus radiata :: Monterey Pine	2278
Pinus Spp :: Pine Spp	257
Pinus strobus :: Eastern white pine	1
Pinus sylvestris :: Scots Pine	1
Pinus thunbergii ‘Thunderhead’ :: Thunderhead Pine	6
Pinus thunbergii :: Japanese Black Pine	105
Pinus torreyana :: Torrey Pine	1
Pistacia chinensis :: Chinese Pistache	428
Pittosporum crassifolium :: Karo Tree	1795
Pittosporum eugenioides :: Tarata	147
Pittosporum spp :: Pittosporum spp	59
Pittosporum tenuifolium :: Tawhiwhi Pittosporum	306
Pittosporum tobira :: Japanese Mockorange	103
Pittosporum undulatum :: Victorian Box	7122
Platanus occidentalis :: American sycamore	3
Platanus orientalis :: Eastern Plane Tree	2
Platanus racemosa :: California Sycamore	74
Platanus x hispanica ‘Bloodgood’ :: Bloodgood London Plane	18
Platanus x hispanica ‘Columbia’ :: Columbia Hybrid Plane Tree	103
Platanus x hispanica ‘Yarwood’ :: Yarwood Sycamore	438
Platanus x hispanica :: Sycamore: London Plane	11557
Podocarpus gracilor :: Fern Pine	226
Podocarpus henkelii :: Long-Leafed Yellow-Wood	19
Podocarpus macrophyllus :: Yew Pine	226
Populus alba :: White Poplar	9
Populus canadensis :: Canadian Poplar	4
Populus deltoides :: Eastern cottonwood	1
Populus nigra ‘Italica’ :: Lombardy Poplar	329
Populus spp :: Poplar Spp	33
Populus tremuloides :: Quaking aspen	15
Populus trichocarpa :: Black Cottonwood Poplar	5
Potential Site :: Potential Site	66
Private shrub :: Private Shrub	17
Privet ::	16
Prunus amygdalus :: Almond	14
Prunus armeniaca :: Apricot	26

species	num_trees
Prunus blireiana :: Flowering Plum	302
Prunus campanulata :: Taiwan Flowering Cherry	2
Prunus caroliniana :: Carolina Cherry Laurel	32
Prunus cerasifera 'Atropurpurea' :: Purple-Leaf Plum	134
Prunus cerasifera 'Krauter vesuvius' :: Purple Leaf Plum Krauter Vesuvius	267
Prunus cerasifera 'Thundercloud' :: Purple-Leaf Plum 'Thundercloud'	9
Prunus cerasifera :: Cherry Plum	6716
Prunus domestica 'Green Gage' :: Green Gage Plum	1
Prunus domestica 'Mariposa' :: Mariposa Plum	194
Prunus domestica 'Santa Rosa' :: Santa Rosa Plum	7
Prunus ilicifolia :: Holly-leaved Cherry	23
Prunus laurocerasus :: English laurel	37
Prunus lusitanica :: Portugese Cherry Laurel	4
Prunus lyonii :: Catalina Cherry	38
Prunus persica :: Peach	54
Prunus persica nectarina :: Flowering Nectarine Tree	1
Prunus sargentii 'Columnaris' :: Sargent Cherry Tree 'Columnaris'	1
Prunus sargentii :: Sargent Cherry	1
Prunus serrula :: Birchbark Cherry	3
Prunus serrulata 'Akebono' :: 'Akebono' Cherry	16
Prunus serrulata 'Amanagawa' :: Flowering Cherry Tree 'Amanagawa'	9
Prunus serrulata 'Double Pink Weeping' :: Weeping Double Pink Flowering Cherry	2
Prunus serrulata 'Kwanzan' :: Kwanzan Flowering Cherry	4025
Prunus serrulata 'Mt. Fuji' :: Mt. Fuji Cherry Tree	9
Prunus serrulata 'Royal Burgundy' :: Royal Burgundy Flowering Cherry Tree	9
Prunus serrulata :: Ornamental Cherry	2696
Prunus spp 'Purpurea' :: Cherry Plum	8
Prunus spp :: Cherry	154
Prunus spp :: Flowering Plum	36
Prunus subhirtella 'Pendula' :: Weeping Cherry	34
Prunus x 'Amanogawa' :: Flowering Cherry	8
Prunus x yedoensis 'Akebono' :: Daybreak Yoshino Cherry	24
Prunus x yedoensis :: Yoshino Cherry	268
Pseudopanax lessonii :: Five finger	1
Pseudotsuga menziesii :: Douglas Fir	29
Psidium guajava :: Guava tree	11
Punica granatum 'Wonderfu' :: Pomegranate Tree 'Wonderful'	6
Pyracantha 'Santa Cruz' :: Firethorn Tree 'Santa Cruz'	34
Pyrus calleryana 'Aristocrat' :: Aristocrat Callery Pear	574
Pyrus calleryana 'Bradford' :: Ornamental Pear: Bradford	171
Pyrus calleryana 'Capital' :: Ornamental Pear Tree 'Capital'	7
Pyrus calleryana 'Chanticleer' :: Ornamental Pear Tree 'Chanticleer'	201
Pyrus calleryana 'Cleveland' :: Ornamental Pear Tree 'Cleveland'	7
Pyrus calleryana 'New Bradford' :: New Bradford Pear	81
Pyrus calleryana 'Redspire' :: Ornamental Pear Tree 'Redspire'	18
Pyrus calleryana :: Ornamental Pear	2969
Pyrus kawakamii :: Evergreen Pear	1974
Pyrus pyrifolia '20th Century' :: Asian Pear '20th Century'	2
Pyrus pyrifolia 'Sainseiki' :: Asian Pear 'Sainseiki'	1
Pyrus spp :: Pear Tree	91
Quercus agrifolia :: Coast Live Oak	598
Quercus alba :: White oak	4

species	num_trees
Quercus coccinea :: Scarlet Oak	19
Quercus douglasii :: Blue Oak	4
Quercus engelmannii :: Engelmann oak	4
Quercus frainetto ‘Trump’ :: Hungarian Oak	8
Quercus ilex :: Holly Oak	143
Quercus kelloggii :: California Black Oak	3
Quercus lobata :: Valley Oak	19
Quercus palustris :: Pin Oak	9
Quercus robur :: English Oak	10
Quercus rubra :: Red Oak	25
Quercus spp :: Oak	22
Quercus suber :: Cork Oak	247
Quercus tomentella :: Island oak	14
Quercus virginiana :: Southern Live Oak	61
Quercus wislizenii :: Interior Live Oak	5
Quillaja saponaria :: Chilean Soapbark	23
Radermachera sinica :: China Doll Tree	4
Rhamnus alaternus ‘John Edwards’ :: John Edwards Buckthorn	3
Rhamnus alaternus :: Italian Buckthorn	618
Rhamnus californica :: Coffeeberry Tree	5
Rhaphiolepis indica :: India Hawthorn	98
Rhaphiolepis Majestic Beauty :: Indian Hawthorn ‘Majestic Beau’	808
Rhopalostylis baueri :: Palm	5
Rhopalostylis sapida :: Nikau palm	1
Rhus lancea :: African Sumac	17
Rhus typhina :: Staghorn sumac	1
Robinia pseudoacacia ‘Umbraculifera’ :: Globe Locust	3
Robinia pseudoacacia :: Black Locust	29
Robinia x ambigua ‘Idahoensis’ :: Idaho Pink Locust	2
Robinia x ambigua ‘Purple Robe’ :: Purple Robe Locust	218
Robinia x ambigua :: Locust	118
Salix babylonica :: Weeping Willow	18
Salix discolor :: Pussy Willow	6
Salix lasiolepis :: Arroyo willow	15
Salix matsudana ‘Tortuosa’ :: Corkscrew Willow	17
Salix spp :: Willow	29
Sambucus mexicana :: Blue Elderberry	4
Sambucus species :: Elderberry	2
Sapium sebiferum :: Chinese Tallow	5
Schefflera species :: Umbrella tree	6
Schinus molle :: California Pepper	350
Schinus polygamus :: Chilean pepper tree	2
Schinus terebinthifolius :: Brazilian Pepper	1059
Sequoia sempervirens :: Coast Redwood	341
Sequoiadendron giganteum :: Sierra Redwood	13
Shrub :: Shrub	116
Solanum rantonnetti ::	11
Sophora japonica ‘Regent’ :: Regent Scholar Tree	8
Sophora japonica :: Japanese Pagoda	6
Sorbus aucuparia :: European Mountain Ash Tr	1
Stenocarpus sinuatus :: Firewheel tree	1
Styphnolobium japonicum :: Chinese scholar tree	17

species	num_trees
Styrax japonicus :: Japanese Snowdrop Tree	2
Syagrus romanzoffianum :: Queen Palm	859
Syringa :: Lilac Tree	7
Syzygium australe :: Eugenia	100
Syzygium paniculatum :: Brush Cherry	489
Taxodium distichum :: Bald Cypress	1
Taxodium mucronatum :: Montezuma Cypress	7
Taxus baccata :: Irish Yew	379
Tecoma stans :: Trumpet bush	4
Thuja occidentalis 'Emerald' :: Emerald Arborvitae	146
Thuja plicata :: Western Red Cedar	12
Tibochina urvilleana :: Princess Flower	55
Tilia americana 'Redmond' :: Redmond Linden	5
Tilia americana :: Basswood Linden	12
Tilia cordata :: Littleleaf Linden	153
Tilia spp :: Linden	3
Tilia tomentosa :: Silver Linden	3
Torreya californica :: California nutmeg	1
Trachycarpus fortunei :: Windmill Palm	421
Tree(s) ::	11629
Tristania conferta ::	1373
Tristaniopsis laurina 'Elegant' :: Small-leaf Tristania 'Elegant'	1797
Tristaniopsis laurina :: Swamp Myrtle	7197
Ulmus 'Frontier' :: Frontier Elm	6
Ulmus 'Prospector' :: Prospector Elm	42
Ulmus americana :: American Elm	286
Ulmus carpinifolia 'Frontier' :: Frontier Elm 'Frontier'	22
Ulmus glabra :: Scotch Elm	1
Ulmus parvifolia 'Athena' :: Chinese Elm 'Athena'	3
Ulmus parvifolia 'Drake' :: Drake's Chinese Elm	154
Ulmus parvifolia 'Sempervirens' :: Weeping Chinese Elm	14
Ulmus parvifolia 'True Green' :: True Green Chinese Elm	1
Ulmus parvifolia :: Chinese Elm	2366
Ulmus procera :: English Elm	2
Ulmus pumila :: Siberian Elm	429
Ulmus spp :: Elm Spp	194
Umbellularia californica :: California Bay	19
Viburnum odoratissimum var. awabuki :: Sweet viburnum	6
Vitex lucens :: Puriri tree	11
Washingtonia filifera :: California Fan Palm	50
Washingtonia robusta :: Mexican Fan Palm	994
Wodyetia bifurcata :: Foxtail palm	1
x Chiranthofremontia lenzii :: Hybrid Monkey Hand Tree	1
Xylosma congestum :: Brush holly	2
Yucca aloifolia :: Spanish bayonet	1
Yucca elephantipes :: Giant Yucca	41
Yucca gloriosa :: Spanish Dagger	390
Yucca spp :: Yucca	11
Zelkova serrata 'Village Green' :: Village Green Zelkova	2
Zelkova serrata :: Sawleaf Zelkova	80
Ziziphus jujuba :: Jujube	3

### 3 How old is the oldest tree in the data set, in years?

```
tree_dat %>%  
  summarise(first_tree = time_length(today() - first(date), "years"))
```

first_tree
65.37988

### 4 How many trees are planted by year?

```
tree_dat %>%  
  mutate(year = year(date)) %>%  
  group_by(year) %>%  
  summarise(num_planted = n())
```

year	num_planted
1955	10
1956	169
1969	334
1970	72
1971	1
1972	1462
1973	732
1974	394
1975	68
1976	362
1977	279
1978	246
1979	379
1980	533
1981	405
1982	568
1983	636
1984	494
1985	635
1986	736
1987	919
1988	601
1989	768
1990	1188
1991	754
1992	1546
1993	1481
1994	1261
1995	2638
1996	1984
1997	1672

year	num_planted
1998	4437
1999	1801
2000	3261
2001	2304
2002	2932
2003	2110
2004	1099
2005	1719
2006	2251
2007	2294
2008	4388
2009	1907
2010	1233
2011	1598
2012	1099
2013	914
2014	1406
2015	2160
2016	1922
2017	1736
2018	1421
2019	942
2020	116
NA	124610

## 5 How many are planted by decade?

The below function might be helpful to you for determining the decade. In this case you'll use it in the `dplyr::mutate()` function.

```
tree_dat %>%
  mutate(year = year(date)) %>%
  mutate(decade = floor(year/10) *10) %>%
  group_by(decade) %>%
  summarise(num_planted = n())
```

decade	num_planted
1950	179
1960	334
1970	3995
1980	6295
1990	18762
2000	24265
2010	14431
2020	116
NA	124610

## 6 Or...

```
floor_decade <- function(value){ return(value - value %% 10) } # I found this on stackoverflow

tree_dat %>%
  mutate(decade = floor_decade(year(date))) %>%
  group_by(decade) %>%
  summarise(num_planted = n())
```

decade	num_planted
1950	179
1960	334
1970	3995
1980	6295
1990	18762
2000	24265
2010	14431
2020	116
NA	124610