Name: Sanjeev Penupala
NetID: SXP170022
Section: 501

1)

unionlist([a, b,[c], [d,e]], [a, [c] ,[d, e], f],Q)

Q = [a, b, [c], [d, e], f]

?-
```
unionlist([a, b,[c], [d,e] ], [ a, [c] ,[d, e], f ],Q)
```

Examples▴ History▴ Solutions▴   ☐ table results Run!

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2)

elements([b, [a, [d, c], e]], X)

X = 5

Next 10 100 1,000 Stop

?- elements([b, [a, [d, c], e]], X)

Examples▲ History▲ Solutions▲   ☐ table results Run!

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3)

delements([a,b,c,d,e,f], Q)

Q = [c, d]
false

?-
```
delements([a,b,c,d,e,f], Q)
```

Examples▲ History▲ Solutions▲   ☐ table results Run!

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4)

⚙ *mother*(X, georgeOfCambridge)

X = catherineOfCambridge
false

?- mother(**X**, georgeOfCambridge)

⚙ *father*(X, georgeOfCambridge)

X = williamOfCambridge

?- father(**X**, georgeOfCambridge)

⚙ *brother*(X, georgeOfCambridge)

X = louisOfCambridge
false

?- brother(**X**, georgeOfCambridge)

⚙ *sister*(X, georgeOfCambridge)

X = charlotteOfCambridge
false

?- sister(**X**, georgeOfCambridge)

⚙ *grandfather*(X, georgeOfCambridge)

X = charlesOfWales
false

?- grandfather(**X**, georgeOfCambridge)

⚙ *grandmother*(X, georgeOfCambridge)

X = camillaOfCornwall
X = dianaOfWales

?- grandmother(**X**, georgeOfCambridge)

⚙ *children*(X, queenElizabeth)

**X** = andrewOfYork
X = anneRoyal
X = charlesOfWales
X = edwardOfWessex

?- children(**X**, queenElizabeth)

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---

step_daughter(X, queenElizabeth)

false

?- step_daughter(**X**, queenElizabeth)

---

step_son(X, queenElizabeth)

false

?- step_son(**X**, queenElizabeth)

---

great_grandfather(X, georgeOfCambridge)

X = philipOfEdinburgh   Predicate defined in line 92
false

?- great_grandfather(**X**, georgeOfCambridge)

---

num_females(X)

X = 18
false

?- num_females(**X**)

---

only_one_child(X)

X = harryOfSussex
X = meghanOfSussex

?- only_one_child(**X**)

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two_children(X)

X = andrewOfYork
X = charlesOfWales
X = edwardOfWessex
X = anneRoyal
X = camillaOfCornwall
X = dianaOfWales

?- two_children(**X**)

at_least_two_children(X)

X = andrewOfYork
X = charlesOfWales
X = edwardOfWessex
X = philipOfEdinburgh
X = williamOfCambridge
X = anneRoyal
X = camillaOfCornwall
X = catherineOfCambridge
X = dianaOfWales
X = queenElizabeth

?- at_least_two_children(**X**)

5)

green	green	green	yellow	yellow	yellow	red	yellow	red	green	blue	blue	blue	14957
green	green	green	yellow	yellow	yellow	red	yellow	red	green	yellow	blue	blue	14958
green	green	blue	yellow	yellow	yellow	red	yellow	yellow	green	red	blue	blue	14959
green	green	blue	yellow	yellow	yellow	red	yellow	yellow	green	blue	blue	blue	14960
green	green	blue	yellow	yellow	yellow	red	yellow	yellow	green	yellow	blue	blue	14961
green	green	yellow	yellow	yellow	yellow	red	blue	yellow	yellow	red	blue	blue	14962
green	green	yellow	yellow	yellow	yellow	red	blue	yellow	yellow	blue	blue	blue	14963
green	green	yellow	yellow	yellow	yellow	red	blue	yellow	yellow	green	blue	blue	14964
green	green	yellow	yellow	yellow	yellow	red	blue	yellow	green	red	blue	blue	14965
green	green	yellow	yellow	yellow	yellow	red	blue	yellow	green	blue	blue	blue	14966
green	green	yellow	yellow	yellow	yellow	red	blue	yellow	green	yellow	blue	blue	14967
green	green	green	yellow	yellow	yellow	red	blue	yellow	yellow	red	blue	blue	14968
green	green	green	yellow	yellow	yellow	red	blue	yellow	yellow	blue	blue	blue	14969
green	green	green	yellow	yellow	yellow	red	blue	yellow	yellow	green	blue	blue	14970
green	green	green	yellow	yellow	yellow	red	blue	yellow	green	red	blue	blue	14971
green	green	green	yellow	yellow	yellow	red	blue	yellow	green	blue	blue	blue	14972
green	green	green	yellow	yellow	yellow	red	blue	yellow	green	yellow	blue	blue	14973
green	green	green	yellow	yellow	yellow	red	yellow	yellow	green	red	blue	blue	14974
green	green	green	yellow	yellow	yellow	red	yellow	yellow	green	blue	blue	blue	14975
green	green	green	yellow	yellow	yellow	red	yellow	yellow	green	yellow	blue	blue	14976

```
0.480 seconds cpu time
0.487 seconds cpu time
0.500 seconds cpu time
0.477 seconds cpu time
```

```
?- map(Austin, Brazoria, Chambers, Colorado, FortBend, Galveston, Harris, Liberty, Matagorda, Montgomery, Walker, Waller,
   Wharton)
```

Examples▲ History▲ Solutions▲   ☑ table results Run!

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6)

total_cases(X)

X = 1310

?- total_cases(**X**)

less_than_hundred_cases(X)

X = a
X = b

?- less_than_hundred_cases(**X**)

highest_deaths(X)

X = f
false

?- highest_deaths(**X**)

more_than_100_cases_less_than_five_deaths(X)

X = c
false

?- more_than_100_cases_less_than_five_deaths(**X**)

largest_cases_or_death(X)

X = f
X = e

?- largest_cases_or_death(**X**)

lowest(X)

X = a
false

?- lowest(**X**)

cases_A_B_C(X)

X = 369

?- cases_A_B_C(**X**)

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more_deaths_than_D(X)

X = e
X = f

?- *more_deaths_than_D*(X)

more_cases_and_deaths_than_D(X)

X = f   functor outofsync

?- *more_cases_and_deaths_than_D*(X)

more_cases_or_deaths_than_D(X)

X = e
**X** = f
X = a
X = b
X = f

?- more_cases_or_deaths_than_D(**X**)

average_deaths(X)

☞ Singleton variables: [Y]
X = 9.833333333333334

?- average_deaths(**X**)

more_than_20_less_than_60_hospitalized(X)

X = c
X = d

?- more_than_20_less_than_60_hospitalized(**X**)

less_than_20_hospitalized(X)

X = a
X = b

?- less_than_20_hospitalized(**X**)

no_deaths(X)

X = a

?- no_deaths(**X**)