

```

In[1]:= Clear["Global`*"]

In[2]:= SetDirectory[$UserDocumentsDirectory];

In[3]:= Manipulate[
  emails01 = Sort[Drop[Import["EmailData.xlsx"]][[1]], 1]];
  emails = emails01;
  emails02 = Union[Flatten[emails01]];
  ap = Union[Flatten[emails]];
  clearance01 = {2, 1, 4, 3, 4, 4, 1, 1, 4, 4, 3};
  clearance = clearance01[[#]] & /@ Flatten[Position[emails02, #] & /@ ap];
  pivot = Flatten[Position[ap, "Anna"]][[1]];
  listacz = emails[[#]][[1]] → emails[[#]][[2]] & /@ Table[a, {a, 1, Dimensions[emails][[1]], 1}];
  CirclePoints[n_] := Table[{Cos[x + degrees], Sin[x + degrees]}, {x, 0, 2 Pi - 2 Pi / n, 2 Pi / n}];
  prt = N[EuclideanDistance[{clearance[pivot]}, {clearance[#]}] & /@ Table[j, {j, 1, Dimensions[clearance][[1]], 1}]];
  pcp = N[prt[[#]] / Max[prt] & /@ Table[gt, {gt, 1, Dimensions[prt][[1]], 1}]];
  cp8 = N[Times[pcp, CirclePoints[Dimensions[pcp][[1]]]]];
  pop = Flatten[{ap[[#]] → ap[[#]]} & /@ Table[j, {j, 1, Dimensions[ap][[1]], 1}]];

  f[gh_] := Total[Count[listacz[[#]], ap[[gh]]] & /@ Table[j, {j, 1, Dimensions[listacz][[1]], 1}]];
  tb = f /@ Table[j, {j, 1, Dimensions[ap][[1]], 1}];
  thick = Count[listacz, listacz[[#]]] & /@ Table[j, {j, 1, Dimensions[listacz][[1]], 1}];
  coord = Partition[Partition[Flatten[emails /. {ap[[#]] → cp8[[#]]} & /@ Table[r, {r, 1, Dimensions[cp8][[1]], 1}]]], 2], 2];
  zei = Flatten[Append[ap, "All"]];
  {GraphPlot[listacz,
    VertexCoordinateRules → cp8,

    VertexRenderingFunction → ({Black, FontSize → 14, Text[#2, cp8[[Position[ap, #2]][[1]][[1]]]],
      Hue[If[clearance[[Position[ap, #2]][[1]][[1]]] == 4, 0.28, If[clearance[[Position[ap, #2]][[1]][[1]]] == 3, 0.158,
        If[clearance[[Position[ap, #2]][[1]][[1]]] == 2, 0.127, If[clearance[[Position[ap, #2]][[1]][[1]]] == 1, 0.01]]]],
      EdgeForm[Black], Opacity[0.37], Disk[cp8[[Position[ap, #2]][[1]][[1]]], 0.02 tb[[Position[pop, #2]][[1]][[1]]]],
      Thin, Dashed, Gray,
      Circle[{0, 0}, Sqrt[cp8[[#]][[1]]^2 + cp8[[#]][[2]]^2]] & /@ Table[k, {k, 1, Dimensions[cp8][[1]], 1}],
      If[person == "All", {}, {Thickness[0.0018 tb[[Position[pop, person]][[1]][[1]]]], Red,
        Circle[cp8[[Position[ap, person]][[1]][[1]]], 0.02 tb[[Position[pop, person]][[1]][[1]]]]} &),

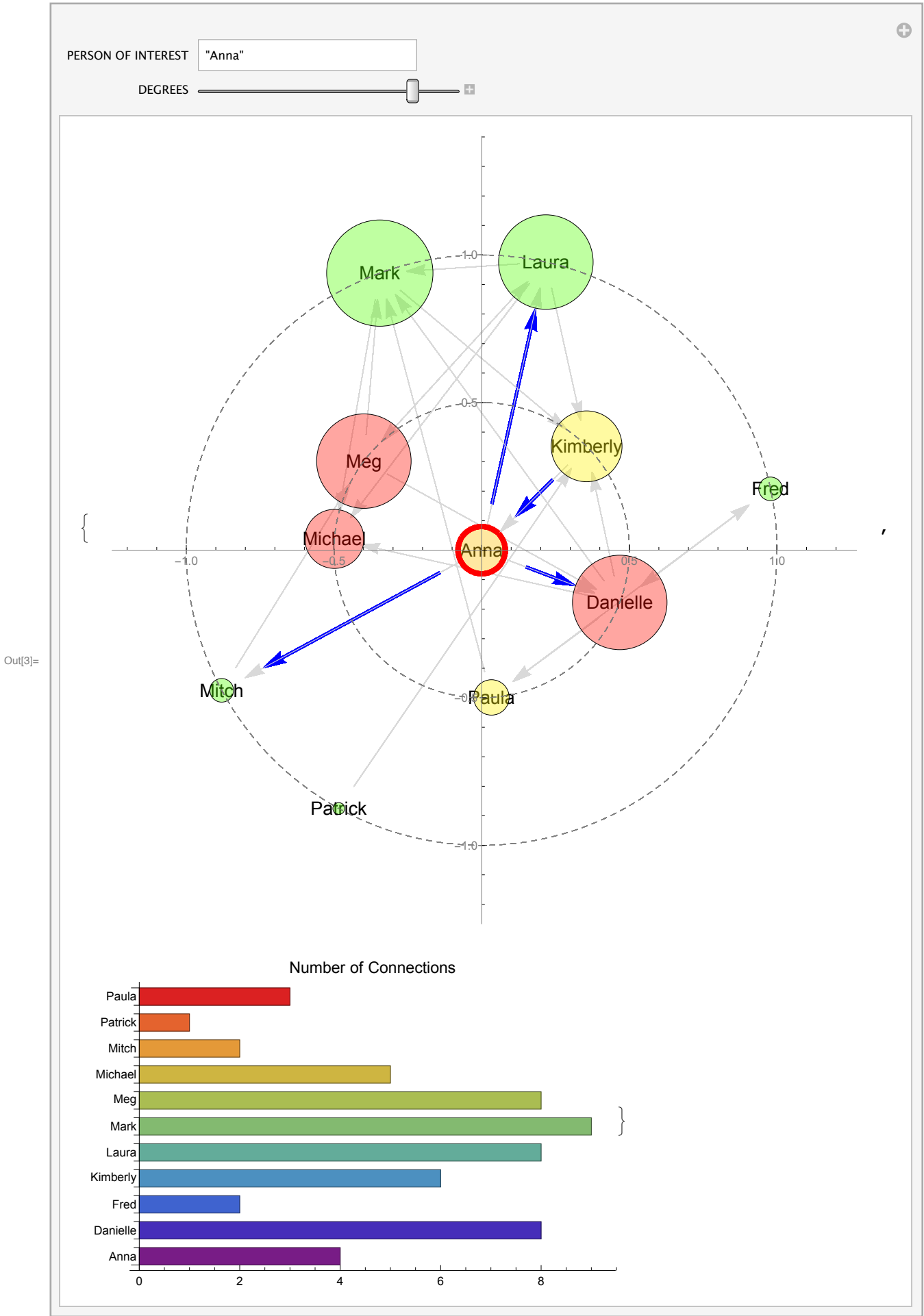
    EdgeRenderingFunction → ({If[person == "All", {Thickness[.0010], Gray,
      Arrowheads[0.025], Arrow[Partition[cp8[[#]] & /@ Flatten[Position[emails02, Flatten[emails][[#]]] & /@
        Table[j, {j, 1, Dimensions[Flatten[emails]][[1]], 1}], 2], 0.04}], {asg = Position[listacz, person];
      rt = asg[[#]][[1]] & /@ Table[g, {g, 1, Dimensions[asg][[1]], 1}];
      ahh = emails[[#]] & /@ rt;
      auau = Flatten[Position[ap, ahh[[#]][[1]]] & /@ Table[g, {g, 1, Dimensions[ahh][[1]], 1}]];
      auau2 = Flatten[Position[ap, ahh[[#]][[2]]] & /@ Table[g, {g, 1, Dimensions[ahh][[1]], 1}]];
      {Thickness[Count[Partition[cp8[[#]] & /@ Flatten[Position[emails02, Flatten[emails][[#]]] & /@ Table[j, {j, 1,
        Dimensions[Flatten[emails]][[1]], 1}], 2], x_ /; x == {cp8[[auau[[#]]], cp8[[auau2[[#]]]]} 0.004],
        Blue, Arrowheads[Count[Partition[cp8[[#]] & /@ Flatten[Position[emails02, Flatten[emails][[#]]] & /@ Table[j, {j,
          1, Dimensions[Flatten[emails]][[1]], 1}], 2], x_ /; x == {cp8[[auau[[#]]], cp8[[auau2[[#]]]]} 0.03],
        Arrow[{cp8[[auau[[#]]], cp8[[auau2[[#]]]]}, 0.16]} & /@ Table[g, {g, 1, Dimensions[auau][[1]], 1}]],

      {Thickness[.0010], LightGray, Arrowheads[0.025], Arrow[Partition[cp8[[#]] & /@
        Flatten[Position[emails02, Flatten[emails][[#]]] & /@ Table[j, {j, 1, Dimensions[Flatten[emails]][[1]], 1}], 2],
        0.09]]} &), ImageSize → {600, 600}, Axes → True, AxesStyle → {Gray, Gray}},

  BarChart[Count[Flatten[emails], #] & /@ emails02, BarOrigin → Left, ChartLabels → emails02,
    BarSpacing → Large, ChartStyle → "Rainbow", ImageSize → 400, PlotLabel → "Number of Connections"]],

  {{person, "Anna", "PERSON OF INTEREST"}, zei}, {{degrees, 5.35, "DEGREES"}, {-7.5, 7.5, 0.05}}

```



```
In[4]:= Grid[emails01]

      Anna    Danielle
      Anna    Laura
      Anna    Mitch
Danielle Kimberly
Danielle Kimberly
Danielle    Mark
Danielle Michael
Danielle Paula
      Fred    Danielle
Kimberly    Anna
      Laura  Kimberly
      Laura    Mark
      Laura    Meg
Out[4]=  Laura Michael
      Laura Michael
      Laura Michael
      Mark  Kimberly
      Mark  Michael
      Meg   Danielle
      Meg   Laura
      Meg   Mark
      Meg   Mark
      Meg   Mark
      Meg   Mark
      Mitch Meg
Patrick Kimberly
Paula    Fred
Paula    Mark
```

```
In[5]:= listacz
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```
Out[5]= {Anna → Danielle, Anna → Laura, Anna → Mitch, Danielle → Kimberly, Danielle → Kimberly, Danielle → Mark,
Danielle → Michael, Danielle → Paula, Fred → Danielle, Kimberly → Anna, Laura → Kimberly, Laura → Mark, Laura → Meg,
Laura → Michael, Laura → Michael, Laura → Michael, Mark → Kimberly, Mark → Michael, Meg → Danielle, Meg → Laura,
Meg → Mark, Meg → Mark, Meg → Mark, Meg → Mark, Mitch → Meg, Patrick → Kimberly, Paula → Fred, Paula → Mark}
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In[6]:= cp8
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Out[6]= {{0., 0.}, {0.467598, -0.177066}, {0.978195, 0.207689}, {0.355312, 0.351786}, {0.217436, 0.976075}, {-0.344787, 0.938681},
{-0.398771, 0.301631}, {-0.498542, 0.0381565}, {-0.880058, -0.474866}, {-0.48362, -0.875278}, {0.0331818, -0.498898}}
```