In[910]:=
```
A1 = {{10, 7, 8, 7}, {7, 5, 6, 5}, {8, 6, 10, 9}, {7, 5, 9, 10}};
A2 = {{1, 2}, {1.001, 2}};
A3 = {{7, 5}, {10, 7}};
A4 = Table[1 / (i + j - 1), {i, 1 , 8}, {j, 1, 8}];
A5 = Table[ If[i == j, 3,
If[i == j + 1 || i == j - 1, 1, 0]], {i, 1, 12}, {j, 1, 12}];

MatrixForm[A1]
MatrixForm[A2]
MatrixForm[A3]
MatrixForm[A4]
MatrixForm[A5]

r1 = N[Max[Eigenvalues[A1]]]
r2 =  N[Max[Eigenvalues[A2]]]
r3 = N[ Max[Eigenvalues[A3]]]
r4 = N[Max[Eigenvalues[A4]]]
r5 =  N[Max[Eigenvalues[A5]]]

cond1[A_, size_] := Max[Sum[Abs[Inverse[A][[All, i]]], {i, 1, size}]] *
    Max[Sum[Abs[A[[All, i]]], {i, 1, size}]];
cond1[A1, 4]
cond1[A2, 2]
cond1[A3, 2]
cond1[A4, 8]
cond1[A5, 12]

condInf[A_, size_] := Max[Sum[Abs[Inverse[A][[i, All]]], {i, 1, size}]] *
    Max[Sum[Abs[A[[All, i]]], {i, 1, size}]];
condInf[A1, 4]
condInf[A2, 2]
condInf[A3, 2]
condInf[A4, 8]
condInf[A5, 12]

cond1[A_] = N[Norm[A, 1] * Norm[Inverse[A], 1]];
condInf[A_] = N[Norm[A, Infinity] * Norm[Inverse[A], Infinity]];
cond2[A_] = N[Norm[A, 2] * Norm[Inverse[A], 2]];
condF[A_] = N[Norm[A, Frobenius] * Norm[Inverse[A], Frobenius]];
```

Out[915]//MatrixForm=

$$\begin{pmatrix} 10 & 7 & 8 & 7 \\ 7 & 5 & 6 & 5 \\ 8 & 6 & 10 & 9 \\ 7 & 5 & 9 & 10 \end{pmatrix}$$

Out[916]//MatrixForm=

$$\begin{pmatrix} 1 & 2 \\ 1.001 & 2 \end{pmatrix}$$

Out[917]//MatrixForm=

$$\begin{pmatrix} 7 & 5 \\ 10 & 7 \end{pmatrix}$$

Out[918]//MatrixForm=

$$\begin{pmatrix} 1 & \frac{1}{2} & \frac{1}{3} & \frac{1}{4} & \frac{1}{5} & \frac{1}{6} & \frac{1}{7} & \frac{1}{8} \\ \frac{1}{2} & \frac{1}{3} & \frac{1}{4} & \frac{1}{5} & \frac{1}{6} & \frac{1}{7} & \frac{1}{8} & \frac{1}{9} \\ \frac{1}{3} & \frac{1}{4} & \frac{1}{5} & \frac{1}{6} & \frac{1}{7} & \frac{1}{8} & \frac{1}{9} & \frac{1}{10} \\ \frac{1}{4} & \frac{1}{5} & \frac{1}{6} & \frac{1}{7} & \frac{1}{8} & \frac{1}{9} & \frac{1}{10} & \frac{1}{11} \\ \frac{1}{5} & \frac{1}{6} & \frac{1}{7} & \frac{1}{8} & \frac{1}{9} & \frac{1}{10} & \frac{1}{11} & \frac{1}{12} \\ \frac{1}{6} & \frac{1}{7} & \frac{1}{8} & \frac{1}{9} & \frac{1}{10} & \frac{1}{11} & \frac{1}{12} & \frac{1}{13} \\ \frac{1}{7} & \frac{1}{8} & \frac{1}{9} & \frac{1}{10} & \frac{1}{11} & \frac{1}{12} & \frac{1}{13} & \frac{1}{14} \\ \frac{1}{8} & \frac{1}{9} & \frac{1}{10} & \frac{1}{11} & \frac{1}{12} & \frac{1}{13} & \frac{1}{14} & \frac{1}{15} \end{pmatrix}$$

Out[919]//MatrixForm=

$$\begin{pmatrix} 3 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 1 & 3 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 1 & 3 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 1 & 3 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 & 3 & 1 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 1 & 3 & 1 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 1 & 3 & 1 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 1 & 3 & 1 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 3 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 3 & 1 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 3 & 1 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 3 \end{pmatrix}$$

Out[920]= 30.2887

Out[921]= 3.00067

Out[922]= 14.0711

Out[923]= 1.69594

Out[924]= 4.94188

Out[926]= 4488

Out[927]= 6002.

Out[928]= 289

Out[929]= 33 872 791 095

Out[930]= $\frac{1160}{233}$

Out[932]= 4488

Out[933]= 4503.

Out[934]= 289

Out[935]= 33 872 791 095

Out[936]= $\frac{1160}{233}$