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% CS 370 Assignment 4, Task 5
% Use array "output" to store err, errbound (for each n)
output = zeros(6,2);

for n = 2:2:12
    b = zeros(n,1); x = b; xexact = b;
    H = hilb(n);
    for i = 1:n
        b(i) = i/(i^2+1);
    end
    x = H\b;
    xexact = invhilb(n)*b;
    err = norm(xexact-x,inf) / norm(x,inf);
    errbound = cond(H,inf)*eps;
    output(n/2,1)=err; output(n/2,2)=errbound;
end
format short e;
output

```

a4q5

```

Warning: Matrix is close to singular or badly scaled.
Results may be inaccurate. RCOND = 2.458252e-017.

```

a4q5out

← Error message from case $n=12$ when executing $H \setminus b$.
 The error message is repeated when executing $\text{cond}(H, \text{inf})$.

output =

<u>n</u>	<u>err_n</u>	<u>error bound</u>
2	2.4672e-016	5.9952e-015
4	1.0402e-014	6.3005e-012
6	3.7247e-011	6.4549e-009
8	1.6989e-007	7.5213e-006
10	3.6093e-005	7.8501e-003
12	1.3300e-002	8.4340e+000

diary off