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% Function to calculate the Hessian of lambda to the entries of projection
% matrix A.
%
% Input:
% A = the projection matrix (n by n matrix)
%
% Function outputs result of Equation (24) (n^2 by n^2 matrix).
%

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```
function H = Hlambda_A(A)
```

```
[lambda, w, v] = domeig(A);
```

```
n = length(v);
```

```
In = eye(n);
```

```
et = ones(n, 1)';
```

```
dw = inv(lambda*In - A + w*et*A) * kron(w', In-w*et); % Eq (19)
```

```
dv = inv(lambda*In - A' + lambda*v*w') * (kron(In-v*w', v') - lambda*kron(v,v')*dw); % Eq (20)
```

```
B = kron(In, v)*dw + kron(w, In)*dv; % Eq (23)
```

```
H = 1/2*(B+B'); % Eq (24)
```

```
end
```