Value function maximization function

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- Filename: vmax.m

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- Purpose: Function that returns the fishery tha maximizes the value function in the Bellman equation.

Description

The function `vamx` returns the the fishery that maximizes the value function from the Bellman equation. Let $a \in A = \{1, ..., J\}$ denote the discrete fishery choice variable, where $a = j$ indicates that fishery j is chosen. Then the optimal fishery a_t^* in period t satisfies:

$$a_t^* = argmax_{a \in A} \pi_{i,t}(a)$$

where $\pi_{i,t}(a)$ is defined and computed in the function <u>func</u>.

```
function [out1,out2] = vmax(t,i,w,m)
```

Input arguments:

- `t` = time period;

- `i` = vessel;

- `w` = expected quota lease prices.

- `m` = a structure of parameter values;

Output Arguments:

- `out1` = the maximum value of the value function.

- `out2` = the argument that maximizes the value function

Parameters

```
A = m.model.actions;                    % Set of all possible
 actions
```

```matlab
da = size(A,1);                         % Number of possible actions
```

Calculate value for each fishery

```matlab
f = zeros(1,da);                        % This period's reward
for j=1:da                              % Loop over all
 possible actions
    f(:,j) = func('f',j,t,i,[],w,m); % Evaluate the reward
end
```

Find fishery with maximum value

```matlab
[out2,out1] = max(f,[],2);

end
```

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