

Fisher's exact test

InStat example:



Corresponding MATLAB:

```
%% Fisher's exact test on proportions of two outcomes
Ns1 = 10; % condition, or status 1 (e.g. control)
Ns2 = 10; % condition, or status 2 (e.g. stimulation)

% Let's assign arbitrary outcome 2 ("1") as "success"
p_suc1 = 0.2; % probability success in status 1
p_suc2 = 0.9; % probability success in status 2

y1 = zeros(1,Ns1);
y2 = ones(1,Ns2);

x1 = [zeros(1,round((1-p_suc1)*Ns1)) ones(1,round(p_suc1*Ns1))]; %
status 1 outcome
x2 = [zeros(1,round((1-p_suc2)*Ns2)) ones(1,round(p_suc2*Ns2))]; %
status 2 outcome

p = fexact( [x1 x2]' , [y1 y2]' )

% approximating by Binomial distribution, 100 times
% http://www.stat.yale.edu/Courses/1997-98/101/binom.htm

count_success1 = binornd(Ns1,p_suc1,1,100); % this draws a count of success
count_success2 = binornd(Ns2,p_suc2,1,100);

y1 = zeros(1,Ns1);
y2 = ones(1,Ns2);

for i = 1:100,
    x1 = [zeros(1,Ns1-count_success1(i)) ones(1,count_success1(i))]; %
status 1 outcome
    x2 = [zeros(1,Ns1-count_success2(i)) ones(1,count_success2(i))]; %
status 1 outcome

    p(i) = fexact( [x1 x2]' , [y1 y2]' );
end

hist(p<0.05);
```

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