Significant difference between donations to senators from telecom industry?

Contents

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Data from https://www.followthemoney.org/show-me?f-fc=1&c-exi=1&c-r-ot=U#%5B%7B1%7Cgro=c-t-id,d-cci

```
% load data
data = readtable('senatordonations.csv');

% extract donation amounts classified by party
amt = table2array(data(:,4));
party = cell2mat(table2array(data(:,3)));
repindex = party ==  'R';
demindex = party ==  'D';
repamt = amt(repindex);
demamt = amt(demindex);
```

```
Warning: Variable names were modified to make them valid MATLAB identifiers. The
original names are saved in the VariableDescriptions property.
```

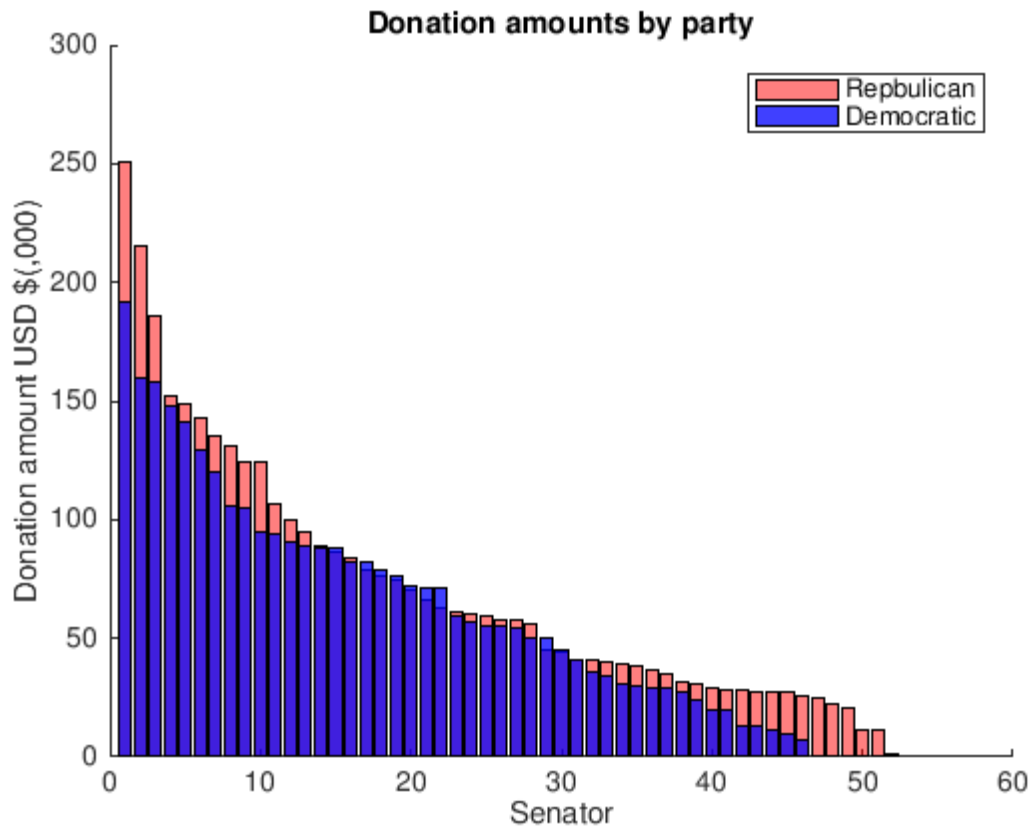
Normality test: One-sample Kolmogorov-Smirnov

```
hrep = kstest(repamt);
hdem = kstest(demamt);

if hrep == 1
    % null hypothesis that data is normally distributed rejected
    fprintf('republican donation amounts are not normally distributed\n');
else
    fprintf('republican donation amounts are normally distributed\n');
end

if hdem == 1
    % null hypothesis that data is normally distributed rejected
    fprintf('democratic donation amounts are not normally distributed\n');
else
    fprintf('democratic donation amounts are normally distributed\n');
end
```

```
republican donation amounts are not normally distributed
democratic donation amounts are not normally distributed
```

Visualize distribution as histogram

```
hold on
barrep = bar(1:length(repamt),repamt, 'r');
bardem = bar(1:length(demamt), demamt, 'b');
barrep.FaceAlpha = 0.5;
bardem.FaceAlpha = 0.75;
title('Donation amounts by party');
ylabel('Donation amount USD $(,000)');
xlabel('Senator')
legend('Repbulican', 'Democratic');
hold off
```



Two sample t-test, Significance between parties by donation amount?

```
h = ttest2(repamt, demamt);

% T-test assumptions:
% Data are independent random samples from normal distributions
% with equal means and equal but unknown variances
% n = 100, central limit theorem applied

fprintf('Two sample t-test at 5%% significance level\n')

if h == 1
    % null hypothesis rejected, not significant
```

```
    fprintf('Party donation amount differences are not significant\n')
else
    % alternative hypothesis
    fprintf('Party donation amount differences are significant\n')
end
```

```
Two sample t-test at 5% significance level
Party donation amount differences are significant
```

Wilcoxson Rank Sum test

equivalent to Mann Whitney U test Recommended non-parametric test for non-normally distributed data

```
p = ranksum(repamt, demamt)

if p > 0.05
    % null hypothesis
    fprintf('samples from continuous distributions with equal medians\n');
else
    % alternative hypothesis
    fprintf('samples NOT from continuous distributions with equal medians\n');
end
```

```
p =

    0.9178

samples from continuous distributions with equal medians
```

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