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COMP 116 sec 1.
Collaborators: none
Instructor: Stan Ahalt
Assignment #2

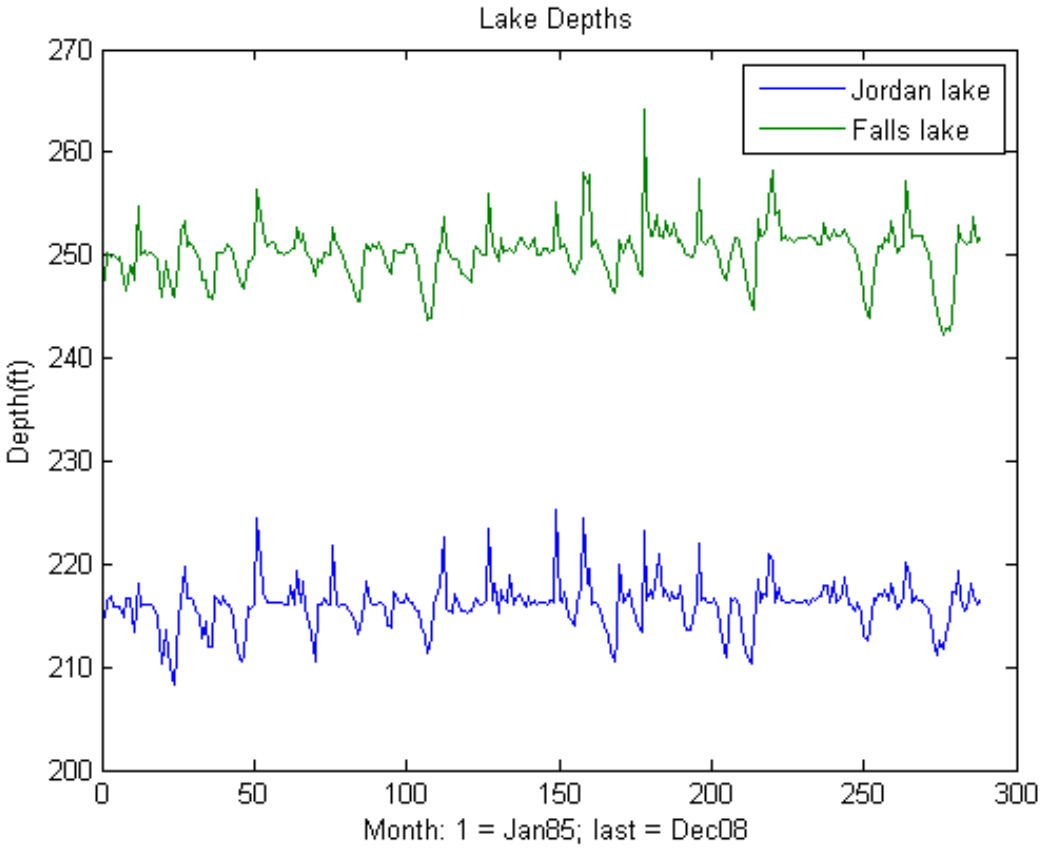
Contents


```
clear
clc
load water08
whos
```

```
  Name           Size            Bytes  Class     Attributes

  depth        288x2              4608  double
  hawgage      365x4             11680  double
  hawrain      365x2              5840  double
  rain         288x2              4608  double
```

Task 1. Lake Depths

```
plot(depth);
title('Lake Depths');
legend('Jordan lake','Falls lake');
xlabel('Month: 1 = Jan85; last = Dec08');
ylabel('Depth(ft)');
```



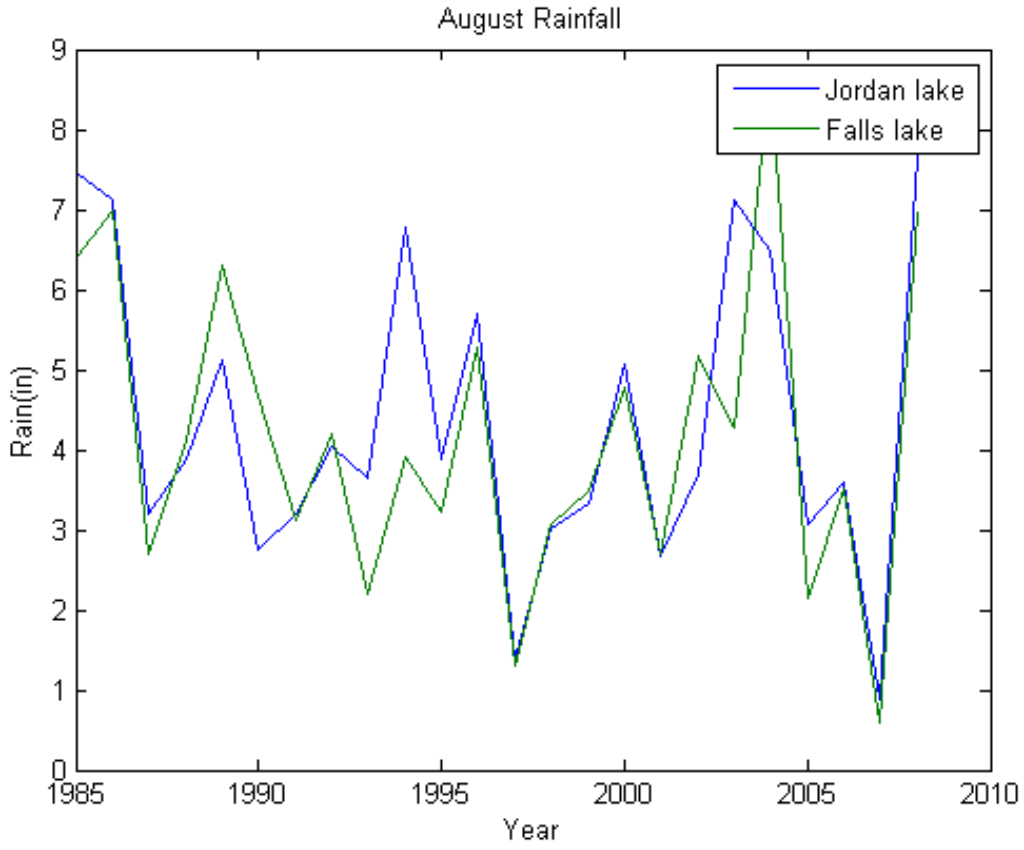
Task 2. Days above target

```
jordan_target = 216;
falls_target = 251.5;
jordan_daysAbove = sum(depth(:,1) > jordan_target);
falls_daysAbove = sum(depth(:,2) > falls_target);
jordan_daysAbove
falls_daysAbove
```

```
jordan_daysAbove =

   186


falls_daysAbove =

    75
```

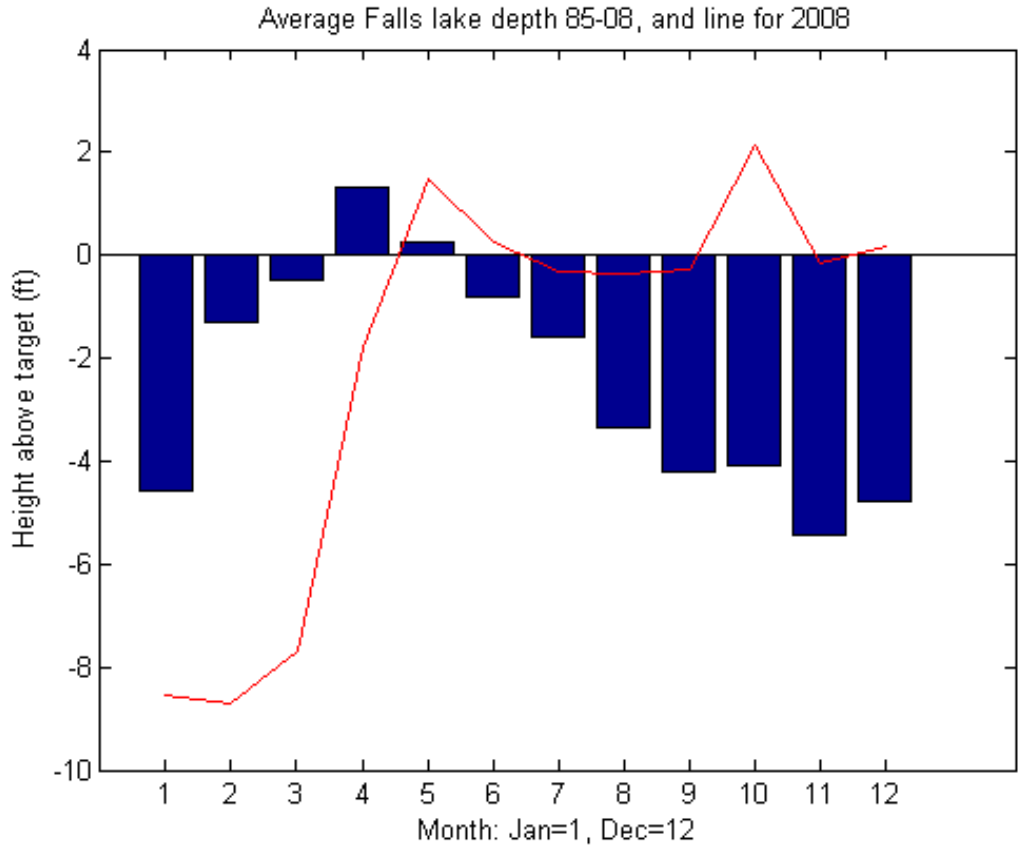
Task 3. Rain in August

```
plot(1985:2008,rain(8:12:end,:));
title('August Rainfall');
legend('Jordan lake','Falls lake');
xlabel('Year');
ylabel('Rain(in)');
```



Task 4. Average depth

```
falls_average_depth = zeros(1,12);
falls08_average_depth = zeros(1,12);
for m = 1:12
    deviation = 0;
    for i = m:12:length(depth)
        deviation = deviation + (depth(i,2) - falls_target);
    end
    falls_average_depth(m) = deviation / 12;
end
bar(falls_average_depth);
title('Average Falls lake depth 85-08, and line for 2008');
xlabel('Month: Jan=1, Dec=12');
ylabel('Height above target (ft)');
hold on
for m = 1:12
    falls08_average_depth(m) = (depth(m+276,2) - falls_target);
end
plot(falls08_average_depth,'r');
hold off
```



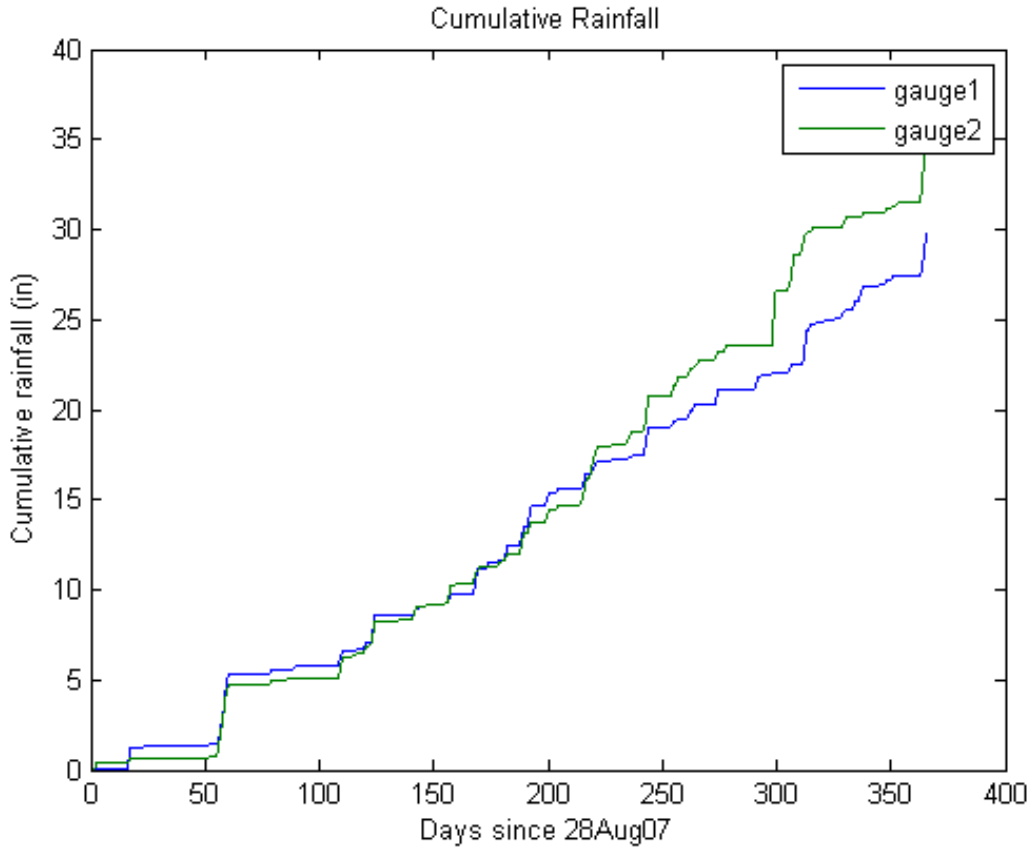
Task 5. Daily Rainfall

```
rainAbove1in = 0;
rainBelow1_4in = 0;
rainAbove1in = sum(hawrain > 1);
rainBelow1_4in = sum(hawrain < .25);
rainAbove1in
rainBelow1_4in
```

```
rainAbove1in =

     7     7


rainBelow1_4in =

   330   324
```

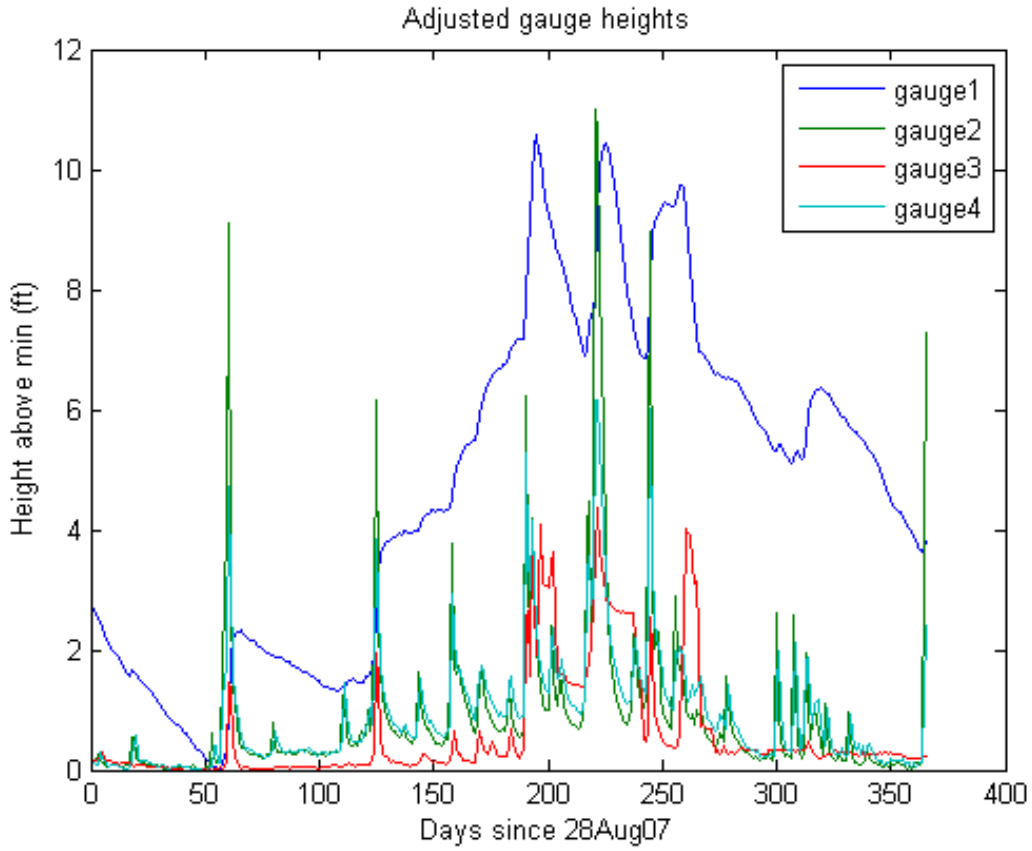
Task 6. Cumulative Rainfall

```
plot(cumsum(hawrain))
title('Cumulative Rainfall');
legend('gauge1','gauge2');
xlabel('Days since 28Aug07');
ylabel('Cumulative rainfall (in)');
% gauge2 received more rain
```



Task 7. Adjusted Gauge Heights

```
adjusted_hawgage = zeros(365,4);
for i = 1:4
    adjusted_hawgage(:,i) = hawgage(:,i) - min(hawgage(:,i));
end
plot(adjusted_hawgage);
title('Adjusted gauge heights');
legend('gauge1','gauge2','gauge3','gauge4');
xlabel('Days since 28Aug07');
ylabel('Height above min (ft)');
```



Task 8. Max daily increase/decrease

```
maxincrease = zeros(1,4);
maxdecrease = zeros(1,4);
for i = 2:length(hawgage)
    for j = 1:4
        daily_change = hawgage(i,j) - hawgage(i-1,j);
        if maxincrease(j) < daily_change
            maxincrease(j) = daily_change;
        elseif daily_change < 0
            if maxdecrease(j) < abs(daily_change)
               maxdecrease(j) = abs(daily_change);
            end
        end
    end
end
maxincrease
maxdecrease
```

```
maxincrease =

    1.1600    7.1500    2.5700    4.3700


maxdecrease =

    0.4700    6.2200    1.5600    2.5300
```

Task 9. Gauge Order

```
% Upstream to Downstream
% Gauge 2, Gauge 3, Gauge 3, Gauge 1 because as you go downstream the max
% daily increase and the max daily decrease both decrease.
% Changes in water height are more dramatic upstream.
```

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