

```
% read OK mesonet wind data files (for 5-minute intervals)

% download files from:
% http://home.chpc.utah.edu/~u0652833/windclassfiles_meso1/
% http://home.chpc.utah.edu/~u0652833/windclassfiles_meso2/

% each file contains data for one year for one variable at 3
stations

% see sgp05okmX1.a1.pdf for metadata

% array sizes:
% 3x105120 (or 3x105408 for a leap year)

% station IDs:
% group 1: 92 44 52
% group 2: 29 108 50

group1 = [92 44 52];

start = 1; % 1 = load data

if start

    load groupone_wspd97.mat
    % load grouptwo_wspd97.mat

    % whos

% Name                Size                Bytes  Class
Attributes
%   groupone_wspd97    3x105120            2522880  double

    load groupone_wdir97.mat

%   Name                Size                Bytes  Class
Attributes
%   groupone_wdir97    3x105120            2522880  double

end

disp('*** Wind Speed Statistics ***')

for i = 1:3 % loop over 3 stations
```

```

disp(' ')
disp(['Station ' num2str(group1(i))])

wspd = groupone_wspd97(i,:);
% wspd = grouptwo_wspd97(i,:);

% find and count missing data (NaN)

miss = isnan(wspd);
total_missing = sum(miss);
disp(['Total missing = ' num2str(total_missing)])

% annual average wind speed and standard deviation

avg = mean(wspd(~miss));
std_dev = std(wspd(~miss));

disp(['Average wind speed = ' num2str(avg)])
disp(['Std dev of wind speed = ' num2str(std_dev)])

% mean wind power density: use density = 1 kg/m^3 for now (Eq.
10-8)

% *** YOUR CODE GOES HERE ***

% wind speed frequency distribution

figure(i)

dx = 0.5; % speed bin (m/s)
x= [dx:dx:25] - 0.5 * dx;

hist(wspd(~miss),x)
grid on
xlabel('wind speed (m/s)')
ylabel('occurences per bin')
title(['Station ' num2str(group1(i))])

orient landscape
fn = ['wspd_freq_dist_' num2str(group1(i)) '.pdf'];
print('-dpdf',fn)

% Mean daily wind speed versus day of year (plot)
-----

% 1. Reshape array (into days).

```

```
% 2. To skip missing data, must find missing data for each day.
```

```
% 3. Use the above arrays to get mean wind speed for each day.
```

```
% *** YOUR CODE GOES HERE ***
```

```
% Mean hourly wind speed versus hour of day (plot)↵
```

```
-----↵  
% 1. Reshape array (into hours).
```

```
% 2. To skip missing data, must find missing data for each hour.
```

```
% 3. Use the above arrays to get mean wind speed for each hour.
```

```
% 4. Reshape hourly average array (into days).
```

```
% 5. Calculate annual average for each hour of the day (24↵  
values).
```

```
% *** YOUR CODE GOES HERE ***
```

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%↵
```

```
-----↵  
-----↵  
% mean turbulence intensity (3-sec samples over 5-min interval)↵  
versus wind
```

```
% speed (Eq. 10-7)
```

```
% Find appropriate dataset in metadata file:
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% http://www.inscc.utah.edu/~krueger/5270/sgp05okmX1.a1.html
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```
% wspd_sigma = "standard deviation of wind speed"
```

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% download files from:
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% http://home.chpc.utah.edu/~u0652833/windclassfiles\_mesol/
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```
% http://home.chpc.utah.edu/~u0652833/windclassfiles\_meso2/
```

```
% *** YOUR CODE GOES HERE ***
```

```
end
```