

**EXAMPLE 3: WIND PROFILE**

The following data observations of wind profile (speed & direction) for hourly data for one year .Write Function M-File

```
[DATE,TIME,SPEED,Dir,DirDegree,NObservation]=WINDPROFILE(Date,Time,speed,wind,direction,Day)
```

To separate day and night wind observations :

day(04:00 am - 18:00 pm) & night(18:00 pm - 04:00 am) in Summer,

day(06:00 am - 18:00 pm) & night(18:00 pm - 06:00 am) in Winter.

Write main program for output(O/P) in 3 sheet in Excel file :-

Sheet1: (I/P)input data (the origin data).

Sheet2:(O/P)output data for day observations.

Sheet3:(O/P)output data for night observations.

Sol.

%The main program SeparateWind.m to separate observations of wind profile for day & night To separate day and night wind observations :

```
%day(04:00 am - 18:00 pm) & night(18:00 pm - 04:00 am) in Summer,
```

```
%day(06:00 am - 18:00 pm) & night(18:00 pm - 06:00 am) in Winter.
```

```
clc ,clear all
```

```
[num txt]=xlsread('wind.xlsx','Sheet1');
```

```
filename='wind.xlsx';
```

```
time=num(:,1);
```

```
speed=num(:,2);
```

```
Date=txt(3:end,1);
```

```
wind_dir=txt(3:end,4);
```

```
direction_degree=num(:,4);
```

```
Day=0;Night=1;
```

```
[DATE,TIME,SPEED,WindDir,DirDegree,NObservation]=WINDPROFILE(Date,time,speed,...
```

```
    wind_dir,direction_degree,Day);
```

```
[DATE1,TIME1,SPEED1,WindDir1,DirDegree1,NObservation1]=WINDPROFILE(Date,time,speed,...
```

```
    wind_dir,direction_degree,Night);
```

```
%%%%%%%%%%%%%% O/P Day Observations
```

```
Sheet=2
```

```
xlswrite(filename,txt(1:2,1:5),Sheet,'a1')
```

```

xlswrite(filename,DATE,Sheet,'a3')
xlswrite(filename,TIME,Sheet,'b3')
xlswrite(filename,SPEED,Sheet,'c3')
xlswrite(filename,WindDir,Sheet,'d3')
xlswrite(filename,DirDegree,Sheet,'e3')
xlswrite(filename,{'Day'},Sheet,'f1')
xlswrite(filename,{'no. of observations'},Sheet,'f2')
xlswrite(filename,NObservation,Sheet,'f3')

```

%%%%%%%%%% O/P Night Observations

Sheet=3

```

xlswrite(filename,txt(1:2,1:5),Sheet,'a1')
xlswrite(filename,DATE1,Sheet,'a3')
xlswrite(filename,TIME1,Sheet,'b3')
xlswrite(filename,SPEED1,Sheet,'c3')
xlswrite(filename,WindDir1,Sheet,'d3')
xlswrite(filename,DirDegree1,Sheet,'e3')
xlswrite(filename,{'Night'},Sheet,'f1')
xlswrite(filename,{'no. of observations'},Sheet,'f2')
xlswrite(filename,NObservation1,Sheet,'f3')

```

%%%%%%%%%%

```
function [DATE,TIME,SPEED,WindDir,DirDegree,NObservation]=WINDPROFILE(Date,Time,...
    speed,wind_dir,direction_degree,Day)
%The following program Function M-File to separate observations of wind
%profile for day & night
formatIn = 'mm/dd/yyyy';
DATE=datenum(Date,formatIn)
y=year(DATE);mm=month(DATE);dd=day(DATE);
time_24am= datenum(0,0,0,[0:23],0,0);
t_4am=time_24am(5);
t_6am=time_24am(7);
t_6pm=time_24am(19);
g=0;h=0;
for i=1: numel(y);
    if mm(i)==1 | mm(i)==2 | mm(i)==3 | mm(i)==4 | mm(i)==11 | mm(i)==12
        if Time(i)>=t_6am & Time(i)<t_6pm
            h=h+1;
            ind_day(h)=i;
        else
            g=g+1;
            ind_night(g)=i;
        end
    else
        if Time(i)>=t_4am & Time(i)<t_6pm
            h=h+1;
            ind_day(h)=i;
        else
            g=g+1;
            ind_night(g)=i;
        end
    end
end
```

```
        end
    end
    if Day==0
        index=ind_day;
    else
        index=ind_night;
    end
    SPEED=speed(index);
    time_4=Time(index);
    t=datestr(time_4);
    TIME=cellstr(t);
    DirDegree=direction_degree(index);
    DATE=Date(index);
    WindDir=wind_dir(index);
    NObservation=numel(index);
    %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
```