Name: Md Toufique Hasan

Student Number: 151129267

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Data Mining Exercise: 4

Answer: 1

```
% Read Power Consumption Data
file1 = readmatrix(['D:\TUNI\Courses\Period-2\DATA.ML.340 [Data Mining]\Weekly exercises 2\' ..
    'Tetuan City power consumption.csv']);

% Omit the idea of time series
file1(:,1) = [];

% Read Power Consumption Data
file2 = readtable(['D:\TUNI\Courses\Period-2\DATA.ML.340 [Data Mining]\Weekly exercises 2\' ...
    'Tetuan City power consumption.csv']);
% Omit the idea of time series
file2(:,1) = [];

% Fifth case from the data and search for its nearest neighbor using Euclidean Distance
[row_num, col_num]=size(file1);

euclid_dis=[];
for n = 1 : row_num
    if (n ~= 5)
        a = norm(file2{5,2:8} - file2{n,2:8});
    end
    euclid_dis(n) = a;
end
min(euclid_dis);

% Fifth case from the data and search for its nearest neighbor using Manhattan Distance
man_dis = [];
for n = 1:row_num

    if (n ~= 5)
       b = sqrt((file2{5,2}-file2{n,2})^2 + (file2{5,3}-file2{n,3})^2+ (file2{5,4}-file2{n,4})^
           + (file2{5,5}-file2{n,5})^2+ (file2{5,6}-file2{n,6})^2 + (file2{5,6}-file2{n,6})^2 .
           + (file2{5,7}-file2{n,7})^2 + (file2{5,7}-file2{n,7})^2);

    end
    man_dis(n) = b;
```

```
end
min(man_dis);


%Fifth case from the data and search for its nearest neighbor using Cosine Distance

cos_dis = [];
for n = 1:row_num
    if (n ~= 5)
        c = 1-(dot(file2{5,2},file2{n,2})/(file2{5,2}*file2{n,2}));
    end
    cos_dis(n) = c;
end
min(cos_dis);
```

Answer 2

```
% Read Power Consumption Data
file3 = readmatrix(['D:\TUNI\Courses\Period-2\DATA.ML.340 [Data Mining]\Weekly exercises 2\' ..
    'Tetuan City power consumption.csv']);

% Omit the idea of time series
file3(:,1) = [];

% Normalize the variables
normal = normc(file3);

[row_num, col_num] = size(normal);

%Eucladian Distance
euclid_dis = [];
for n = 1 : row_num
    if (n ~= 5)
        a = norm(normal{5,2:8} - normal{n,2:8});
    end
    euclid_dis(n) = a;
end
min(euclid_dis);

% Manhattan Distance
man_dis = [];
for n = 1:row_num

    if (n~=5)
       b = sqrt((normal{5,2}-normal{n,2})^2 + (normal{5,3}-normal{n,3})^2+ (normal{5,4}-normal
           + (normal{5,5}-normal{n,5})^2+ (normal{5,6}-normal{n,6})^2 + (normal{5,6}-normal{n,6
           + (normal{5,7}-normal{n,7})^2 + (normal{5,7}-normal{n,7})^2);
```

```
    end
    man_dis(n)=b;
end
min(man_dis)

% Cosine Distance
cos_dis = [];
for n = 1:row_num
    if (n~=5)
        c = 1-(dot(normal{5,2},normal{n,2})/(normal{5,2}*normal{n,2}));
    end
    cos_dis(n) = c;
end
min(cos_dis);
```

Answer: 3

```
% Read Power Consumption Data
file3=readmatrix(['D:\TUNI\Courses\Period-2\DATA.ML.340 [Data Mining]\Weekly exercises 2\' ...
    'Tetuan City power consumption.csv']);
file3(:,1)=[];

% Scale the variables into the interval [0 1]
Scale=rescale(file3)

[row_num, col_num] = size(Scale);

% Eucladian Distance
euclid_dis=[];
for n = 1 : row_num
    if (n ~= 5)
        a=norm(Scale{5,2:8}-Scale{n,2:8});
    end
    euclid_dis(n)=a;
end
min(euclid_dis);

% Manhattan Distance
man_dis=[];
for n = 1:row_num
    if (n ~= 5)
       b = sqrt((Scale{5,2}-Scale{n,2})^2 + (Scale{5,3}-Scale{n,3})^2+ (Scale{5,4}-Scale{n,4})^
           (Scale{5,5}-Scale{n,5})^2+ (Scale{5,6}-Scale{n,6})^2 + (Scale{5,6}-Scale{n,6})^2 +
           (Scale{5,7}-Scale{n,7})^2 + (Scale{5,7}-Scale{n,7})^2);
    end
    man_dis(n) = b;
end
min(man_dis)
```

```
% Cosine Distance
cos_dis=[];
for n = 1:row_num
    if (n~=5)
        c = 1-(dot(Scale{5,2},Scale{n,2})/(Scale{5,2}*Scale{n,2}));
    end
    cos_dis(n) = c;
end
min(cos_dis);
```

Answer: 5

```
file4 = readmatrix(['D:\TUNI\Courses\Period-2\DATA.ML.340 [Data Mining]\' ...
    'Weekly exercises 4\Iris.txt']);
x = file4(5,2:5);
y = file4(:,2:5);
s = size(y);
rep = repmat (x,s (1),1);
delta = y-rep;
results = zeros(s(1),1);
for i = 1:150
 Ed = sqrt(delta(i,:)*delta(i,:)');
 results(i) = Ed;
end
results(5) = [];
[Value, Position] = min(results)
```

```
Value = 0.1414
Position = 1
```

Answer: 6

```
file5 = readmatrix(['D:\TUNI\Courses\Period-2\DATA.ML.340 [Data Mining]\' ...
    'Weekly exercises 4\Iris.txt']);
mdata = [file5(:,2) file5(:,4) file5(:,5)];
mdata = mean(mdata,2);
newdata = [file5(:,3) mdata];
x = newdata(5,:);
ind = knnsearch (newdata, x,'K',2);
nearest = ind(2)
```

```
nearest = 41
```