

List Corpus

# Data Interpretation – AirQuality\_interpreter()

System Category	PSI Index	PSI	PM25	PM10	SO <sub>2</sub>	CO	O <sub>3</sub>	NO <sub>2</sub>
Good	Good	0-50	0-12	0-50	0-80	0-5	0-118	0
Admissible	Moderate	51-100	13-55	51-15	81-365	5.1-10	119-157	0
Bad	Unhealthy	101-200	56-150	151-350	366-800	10.1-17.0	158-235	1130
	Very Unhealthy	201-300	151-250	351-420	801-1600	17.1-34.0	236-785	1131-2260
Hazardous	Hazardous	301-400	251-350	421-500	1601-2100	34.1-46.0	786-980	2261-3000
		401-500	351-500	501-600	2101-2620	46.1-57.5	981-1180	3001-3750

```
PSI_data <- c(PM25_PSI_value, PM10_PSI_value, SO2_PSI_value, CO_PSI_value)
PSI_value <- as.integer(max(PSI_data))
```

```
if((PSI_value>=0)&&(PSI_value<=50)){
  return("good")
}
else if((PSI_value>50)&&(PSI_value<=100)){
  return("admissible")
}
else if((PSI_value>100)&&(PSI_value<=250)){
  return("bad")
}
else{
  return("hazardous")
}
```

```
PM25<-as.double(dataset["PM25"])
if((PM25>=0)&&(PM25<=12)){
  b2<-12; b1<-0; a2<-50; a1<-0;
}
else if((PM25>12)&&(PM25<=55)){
  b2<-55; b1<-13; a2<-100; a1<-51
}
else if((PM25>55)&&(PM25<=150)){
  b2<-150; b1<-56; a2<-200; a1<-101
}
else if((PM25>150)&&(PM25<=250)){
  b2<-250; b1<-151; a2<-300; a1<-201
}
else if((PM25>250)&&(PM25<=350)){
  b2<-350; b1<-251; a2<-400; a1<-301
}
else if((PM25>350)&&(PM25<=500)){
  b2<-500; b1<-351; a2<-500; a1<-401
}
else{
  b2<-500; b1<-351; a2<-500; a1<-401
}
PM25_PSI_value <- ((a2-a1)/(b2-b1))*(PM25-b1)+a1
```

$$\begin{aligned}
 I_i &= \frac{I_{i,j+1} - I_{i,j}}{X_{i,j+1} - X_{i,j}} (X_i - X_{i,j}) + I_{i,j} \\
 &= \frac{100 - 50}{55 - 12} (40 - 12) + 50 \\
 &= 83
 \end{aligned}$$

# Data Interpretation – Wind speed

No	Speed (km/h)	Kelas
1	$x < 2$	Calm
2	$2 \leq x < 5$	Light Air
3	$6 \leq x < 11$	Light Breeze
4	$12 \leq x < 19$	Gentle Breeze
5	$20 \leq x < 29$	Moderate Breeze
6	$30 \leq x < 39$	Fresh Breeze
7	$40 \leq x < 50$	Strong Breeze
8	$51 \leq x < 61$	Near Gale
9	$62 \leq x < 74$	Gale
10	$74 \leq x < 87$	Strong Gale
11	$88 \leq x < 102$	Storm
12	$103 \leq x < 118$	Violent Storm
13	$119 \leq x < 130$	Hurricane

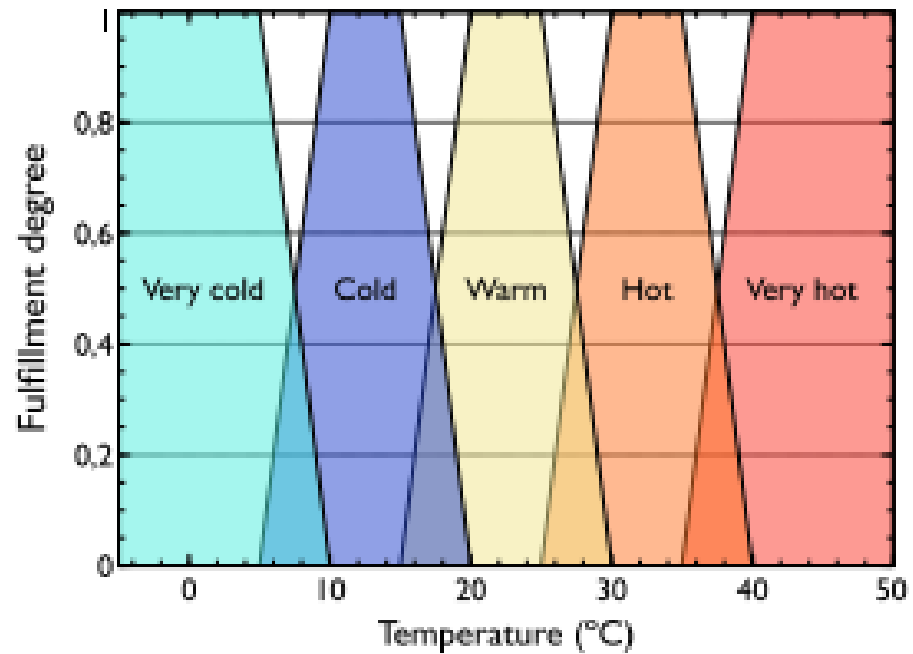
# Data Interpretation – Wind Direction

No	degree	class
1	348.75-11.25	North
2	11.25-33.75	North North East
3	33.75-56.25	North East
4	56.25-78.75	East North East
5	78.75-101.25	East
6	101.25-123..75	East South East
7	123.75-146.25	South East
8	146.25-168.75	South South East
9	168.75-191.25	South
10	191.25-213.75	South South West
11	213.75-236.25	South West
12	236.25-258.75	West South West
13	258.75-281.25	West
14	281.25-303.75	West North West
15	303.75-326.25	North West
16	326.25-348.75	North North West

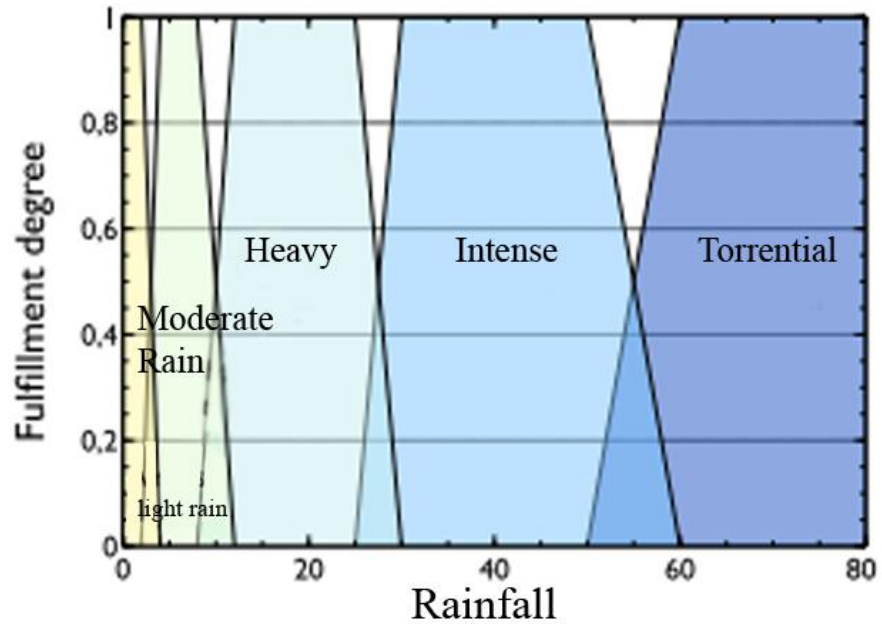
# Data Interpretation – Cloud Coverage

NO	Cakupan Awan (%)	kelas
1	0-10	Clear
2	10-20	Foggy
3	20-30	Mostly sunny
4	40-60	Partly cloudy
5	70-80	Mostly cloudy
6	80-90	Broken
7	90-100	overcast

# Data Interpretation – Temperature



# Data Interpretation – Rainfall



# Doc Planning

- Prediction Result

- [1] " Regarding to the prediction result, tomorrow sky state will be light rain although its covered by partly cloudy sky"
- [2] " Followed by temperature which increased to warm"
- [3] " According to the air quality state, it will still stable at good "

- Weather Summary

- [1] " According to the monthly summary result, this month was cooler and wetter than average"
- [2] " With average number of rain days, the total rain so far is well above the average "
- [3] " There was rain on everyday for 4 days from 27th to 30th and heavy rain were spilled in 28th and 29th"
- [4] " The wind for the month was light breeze in average"
- [5] " Average air quality was admissible"
- [6] " Average temperature was increased but 29 th was the coldest day of the month with 14,5 celcius degree temperature"



# Doc Planning – Weather Prediction

- Routine Message -> Rainfall, Cloud & Air Quality
- Significant Event Message -> Wind Speed & Wind Direction

Weather Prediction →

Sky State Message,  
Temperature Message,  
Air Quality Message,  
Wind State Message|

Sky State Message →

Rainfall Message,  
Cloud Coverage Message

Wind State Message →

Wind Speed State,  
Wind Direction State

BASED ON PREDICTION RESULT, PREDICTED THAT A STORM RAIN WILL COME COVERED WITH OVERCAST CLOUD. FOLLOWED BY VERY WARM TEMPERATURE. WITH RESPECT TO THE AIR QUALITY STATE, IT WILL CHANGE PROGRESSIVELY TO BAD. WIND WILL BLOW VERY STRONG FROM THE NORTH.

# Microplanning - Weather Prediction

[1] "Tomorrow sky state is predicted that the sky will be light rain although its covered by partly cloudy sky"  
[2] " Followed by temperature which increased to warm"  
[3] " According to the air quality state, it will keep stable at good "

- Sky Sentence
- Temperature Sentence
- AQ sentence
- Wind Sentence

```
Structure_Realization_predict <- function(InterpretationResult_rainfall, InterpretationResult_cloudCoverage, InterpretationResult_temperature, InterpretationResult_AQ, InterpretationResult_wind)
{
  Rain_State <- InterpretationResult_rainfall
  Cloud_State <- InterpretationResult_cloudCoverage
  Sky_State <- Sky_Agg(Rain_State, Cloud_State)
  Sky_Intro <- Prediction_Intro()
  Sky_Sentence <- paste(Sky_Intro, Sky_State)
  Temperature_Intro <- Temperature_Intro()
  Temperature_Sentence <- paste(Temperature_Intro, Temperature_State)
  AQ_Sentence <- AQ_Description
  Wind_Sentence <- Wind_Description
  Prediction_Result <- paste(Sky_Sentence, Temperature_Sentence, AQ_Sentence, Wind_Sentence)
  return(Prediction_Result)
}
Prediction_Result <- Structure_Realization_predict(InterpretationResult_rainfall, InterpretationResult_cloudCoverage, InterpretationResult_temperature, InterpretationResult_AQ, InterpretationResult_wind)
```

# Weather Prediction(1) – Sky Sentence

```
[1] "Tomorrow sky state is predicted that the sky will be light rain although its covered by partly cloudy sky"  
    red = sky_intro  
    blue = sky_state
```

```
Rain_State <- InterpretationResult_rainfall  
Cloud_State <- InterpretationResult_cloudCoverage  
sky_state <- Sky_Agg(Rain_State,Cloud_State)  
sky_intro <- Prediction_Intro()  
sky_sentence <- paste(sky_intro,sky_state)
```

- Sky\_Intro:

```
1 ["Based on prediction result, tomorrow sky status will be"  
2 "Regarding to the prediction result, tomorrow sky state will be"  
3 Galicia(s) sky state is predicted that the sky will be  
4 Tomorrow sky state is predicted that the sky will be  
5 "Regarding to the prediction result, tomorrow sky state will be"  
6
```

# Sky Sentence – Sky\_state (2)

- Sky\_State <- Sky\_Agg(Rain\_State,Cloud\_State)

```
sky_Agg <- function (rain,cloud){  
  #Assign Rule for Contrast Value for each partition of rain state  
  if(rain=="no rain"||rain=="light rain"){  
    Contrast1=0  
  }  
  else if(rain=="moderate rain"||rain=="heavy rain" ||  
    rain=="intense rain" || rain=="torential rain")  
  ){  
    Contrast1=1  
  }  
  #Assign Rule for Contrast value for each partition of cloud state  
  if(cloud=="clear"||cloud=="foggy"||cloud=="mostly sunny"){  
    Contrast2=0  
  }  
  else if(cloud=="partly cloudy"||cloud=="mostly cloudy"||cloud=="broken"  
    || cloud=="overcast")  
  ){  
    Contrast2=1  
  }  
  
  if(Contrast1==Contrast2){  
    Conjunction<-"covered with"  
  }else{  
    Conjunction<- "although its covered by"  
  }  
  
  phrase <- paste(rain,Conjunction,cloud,"sky.")  
  return(phrase)  
}
```

"light rain although its covered by partly cloudy sky."

light rain = message1 (contrast 0)  
partly cloudy = message2 (contrast 1)  
although its covered by = conjunction

# Weather Prediction(2) – Temperature Sentence

- [2] " Followed by temperature which increased to warm"
- **Temperature\_Sentence** <- paste(Temperature\_Intro, Temperature\_State)
- **Temperature\_Intro**

```
1 Favored by temperature which  
2 Followed by temperature which  
3
```

- **Temperature\_State**<-paste(TrendDesc\_Temperature, InterpretationResult\_temperature)
  - increased to (TrendDesc\_Temperature) warm (InterpretationResult\_temperature)
- TrendDesc\_Temperature <- TrendDesc\_2(as.double(TodaysWeather["Temperature"]), as.double(y[, "Average.Temperature"]))

# Temperature Sentence - TrendDesc\_Temperature

- Input: Value1, Value2
- Output:

```
TrendDesc_2 <- function(var1,var2){  
  print("woooY")  
  print(var1)  
  print(var2)  
  if(var2>var1){  
    return("increased to")  
  }  
  else if(var2<var1){  
    return("decreased to")  
  }  
  else{  
    x<-as.integer(runif(1,1,4))  
    if(x==1){  
      return("keep stable at")  
    }  
    if(x==2){  
      return("stay stable at")  
    }  
    if(x==3){  
      return("constant at")  
    }  
  }  
}
```

# Weather Prediction(3) - AQ sentence

[3] " According to the air quality state, it will keep stable at good "

- AQ\_Description <- paste(Intro\_AQ,TrendDesc\_AQ,AQ\_seq[3],".")

- Intro\_AQ

```
1 ["with Respect to the air quality state, it will"  
2 "According to the air quality state, it will"  
3 "Regarding to the air quality prediction result, discovered that air quality state will"  
4 "Based on the air quality forecast result, it will"  
5
```

- AQ\_seq[3] <- InterpretationResult\_airQuality \*Prediksi AQ, output dr data interpertation\*

# AQ sentence – TrendDesc\_AQ (1)

- TrendDesc\_AQ <- LD\_Compare(AQ\_seq,AQ\_val) (skripsi hal 81)

```
LD_Compare <- function (data, value){  
  #map data-set to Index-set  
  i=1; n=length(data); index_data<-matrix();  
  for(i in 1:n){  
    j=1; m=length(AQ_val)  
    for(j in 1:m){  
      x<-colnames(value[j])  
      #cat("x : ",x," data: ",data[i],"\\n")  
      if(data[i]==x){  
        index_data[i]<-value[j]  
      }  
    }  
  }  
  print(index_data)  
  #Compute Index Variation  
  i=1; n=length(data); IV<-c(0,0);  
  for(i in 1:n){  
    if(i<n){  
      IV[i]<-((index_data[[i+1]])-(index_data[[i]]))  
    }else{  
      IV[i]<-index_data[[i]]  
    }  
  }  
  print(IV)  
  #Apply Rules  
  i=1; IVL<-c(0,0)  
  for(i in 1:n){  
    if(IV[i]>0){  
      IVL[i]="+"  
    }else if(IV[i]<0){  
      IVL[i]="-"  
    }else{  
      IVL[i]="0"  
    }  
  }  
  x<-TrendDesc_template(IVL)  
  return(x)  
}
```



# AQ sentence – TrendDesc\_AQ (2)

- TrendDesc\_Template

```
change_word_bank_AQ <- function (fragmentCode){  
  phraseAQ <- read.table(file="wordbank/AQ_phrase_bank.csv", sep=";", header=TRUE)  
  n=length(phraseAQ); i=1;  
  for(i in 1:n){  
    m=colnames(phraseAQ[i])  
    if(fragmentCode==m){  
      j=runif(1,1,n+1)  
      return(phraseAQ[j,i])  
    }  
  }  
}
```

```
TrendDesc_template <- function (IVL,data){  
  if((IVL[1]=="0")&&(IVL[2]=="0")){  
    TrendDesc <- change_word_bank_AQ("stable")  
  }  
  if(((IVL[1]=="+"&&(IVL[2]=="-"))||((IVL[1]=="-")&&(IVL[2]=="+"))){  
    TrendDesc <- change_word_bank_AQ("mediumChange")  
  }  
  if(((IVL[1]=="+"&&(IVL[2]=="0"))||((IVL[1]=="-")&&(IVL[2]=="0"))){  
    TrendDesc <- change_word_bank_AQ("startChange")  
  }  
  if(((IVL[1]=="0")&&(IVL[2]=="+"))||((IVL[1]=="0")&&(IVL[2]=="-"))){  
    TrendDesc <- change_word_bank_AQ("endChange")  
  }  
  if(((IVL[1]=="+"&&(IVL[2]=="+"))||((IVL[1]=="-")&&(IVL[2]=="-"))){  
    TrendDesc <- change_word_bank_AQ("progressiveChange")  
  }  
  return(TrendDesc)  
}
```

```
1 |stable,mediumChange,startChange,endChange,progressiveChange  
2 |stay stable at,moderately change to,start to change to,start to change to,change progressively to  
3 |keep stable at,averagely turn to,begin to turn to,begin to turn to,turn progressively to  
4 |constant at,moderately turn to,move to,move to,move progressively to  
5 |steady at,averagely change to,shifted to,shifted to,shifted progressively to  
6 |still stable at,normal change to,normaly move to,normaly move to,change progressively to  
7 |
```

# Weather Prediction(4) - AQ sentence

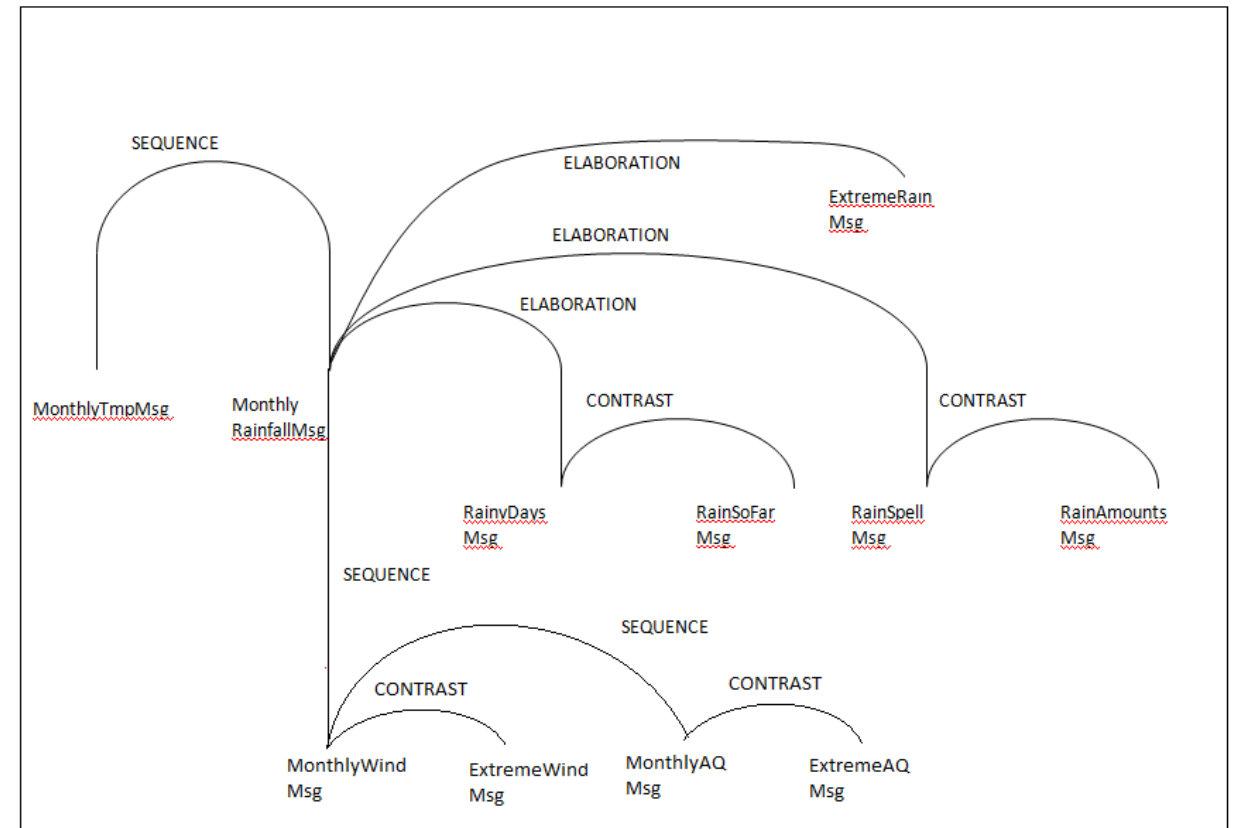
[1] "the wind will blow strong breeze from the west."

- strong breeze = wind speed
- from the west = wind direction

# Doc Planning – Weather Summary

- Target Corpus:

THE MONTH WAS COOLER AND DRIER THAN AVERAGE, WITH AVERAGE NUMBER OF RAIN DAYS, BUT THE TOTAL RAIN FOR THE YEAR SO FAR IS WELL BELOW AVERAGE. ALTHOUGH THERE WAS RAIN ON EVERY DAY FOR 8 DAYS FROM 11TH TO 18TH, RAINFALL AMOUNTS WERE MOSTLY SMALL. HEAVY RAIN WERE HAPPENED IN 12TH, 13TH, AND 14TH. THE MONTH WAS MOSTLY CALM, BUT STRONG WINDS BLEW ON 20TH, 24TH AND 26TH. AVERAGE AIR QUALITY WAS CALCULATED ADMISSIBLE, BUT HAZZARDOUS INDEX FOUND IN 12TH.



# Weather Summary – Ordinal number

- Input: Number
- Output: Ordinal number
  - Ex: Param = 1, return 1<sup>st</sup>
  - Ex: Param = 2, return 2<sup>nd</sup>
  - etc

```
ordinal_indicator <- function(num){  
  if(num==11){  
    oi<-"th"  
    return(oi)  
  }  
  x<-nchar(num)  
  y<-substrRight(num,1)  
  oi<-" "  
  if(y==1){  
    oi<-"st"  
  }  
  else if(y==2){  
    oi<-"nd"  
  }  
  else if(y==3){  
    oi<-"rd"  
  }  
  else{  
    oi<-"th"  
  }  
  return(oi)  
}
```

# Weather Summary - MonthlyTempMsg

- Input: Average temperature (Year), Average temperature (Last Month)
- Output : cooler/stable/warmer

```
MonthlyTempMessage_function <- function(YearMean_average, MonthMean_average){  
  yearmean <- as.double(YearMean_average["Average.Temperature"])  
  monthmean <- as.double(MonthMean_average["Average.Temperature"])  
  if(yearmean<monthmean){  
    message<- c("cooler",0)  
  }  
  else if(yearmean==monthmean){  
    message<- c("stable",1)  
  }  
  else if(yearmean>monthmean){  
    message<- c("warmer",2)  
  }  
  return(message)  
}
```

```
MonthlyTempMsg <- MonthlyTempMessage_function(YearMean_result, LMmean_result)
```

# Weather Summary - RainyDayMsg

- Input: Rainfall data (Last Month)
- Output : Rainfall message

```
RainyDaysMessage_function <- function(LM){  
  n<-nrow(LM); i<-1; number_rain<-0; x<-LM["Rainfall"]; msg<-""  
  for(i in 1:n){  
    if(x[i,1]>0){  
      number_rain <- number_rain + 1  
    }  
  }  
  if(number_rain<=5){  
    msg<-c("low number of rain",0)  
  }  
  else if(number_rain>=6 && number_rain <=15){  
    msg<-c("average number of rain",0)  
  }  
  else{  
    msg<-c("high number of rain",2)  
  }  
  return(msg)  
}  
RainyDaysMsg <- RainyDaysMessage_function(LM)
```

# Weather Summary - RainSoFarMessage

- Input: Rainfall data (Last Month), Rainfall average (Last Month)
- Output : RainSoFarMessage
- Ex: [1] "well above the average" "2"

```
RainSoFarMessage_function <- function(LM,MonthMean_average){  
  LM <- LM[(NROW(LM)-7):NROW(LM), ]  
  n<-nrow(LM); i<-1; number_rain<-0; x<-as.matrix(LM["Rainfall"]); msg<-"";  
  weeklymean<-mean(x)  
  monthlymean <- as.double(MonthMean_average["Rainfall"])  
  if(weeklymean>monthlymean){  
    msg<-c("well above the average",2)  
  }  
  else{  
    msg<-c("well below the average",0)  
  }  
  return(msg)  
}  
RainSoFarMessage <- RainSoFarMessage_function(LM,LMmean_result)
```

# Weather Summary - RainSpellMsg

- Input: Rainfall data (Last Month)
- Output : RainSpellMessage
- Ex: "6 days from 27th Jun to 2nd Jul "

[,1]	[,2]	[,3]
[1,]	"2"	"2017-06-08" "2017-06-09"
[2,]	"1"	"2017-06-13" "2017-06-13"
[3,]	"1"	"2017-06-22" "2017-06-22"
[4,]	"6"	"2017-06-27" "2017-07-02"

```
RainSpellMessage<-function(LM){
  x<-as.matrix(LM["Rainfall"])
  n<-length(x);i<-1;j<-0;k<-1;l<-0;status=0;
  seq<-matrix("0",nrow=n,ncol=3)
  for(i in 1:n){
    if(x[i]==0){
      status=0
      if(i!=1){
        if(x[i-1]>0){
          out_date <- as.character(LM[i-1,"Date"])
          seq[j,3] <- out_date
        }
      }
    }
    else if((x[i]>0)&&(status==0)){
      status=1
      j<-j+1
      seq[j,1] <- as.integer(seq[j,1]) + 1
      in_date <- as.character(LM[i,"Date"])
      seq[j,2] <- in_date
    }
    else if((x[i]>0)&&(status==1)){
      seq[j,1] <- as.integer(seq[j,1]) +1
    }
  }
}
```

```
if(max_index==1){
  return("")
}
if(in_mnth==out_mnth){
  max_spell<-paste(max(seq[,1])," days from ",in_spell,in_ordinal,
    " to ",out_spell,out_ordinal," ",sep="")
  print("First Condition")
}
else{
  in_mnth <- month.abb[as.double(in_mnth)]
  out_mnth <- month.abb[as.double(out_mnth)]
  max_spell<-paste(max(seq[,1])," days from ",in_spell,in_ordinal, " ", in_mnth,
    " to ",out_spell, out_ordinal, " ", out_mnth," ",sep="")
  print("Second Condition")
}
msg<-max_spell
return(msg)
}
```

```
RainSpellMsg <- RainSpellMessage(LM)
```



# Weather Summary - RainExtremeMsg

- Input: Rainfall data (Last Month)
- Output : RainSpellMessage
- Ex: "heavy rain were dropped in 28th and 29th"
  - Heavy rain = status
  - Were = auxiliary
  - Dropped = verb
  - 28, 29 = date
  - Th = ordinal number

```
for(i in 1:j){  
  if(j==1){  
    oi <- ordinal_indicator(time_happened[i])  
    th <- paste(time_happened[i],oi,sep="")  
    msg<- paste(" ",msg,th,".",sep="")  
  }  
  else{  
    if((i!=j)&&(i!=j-1)){  
      oi <- ordinal_indicator(time_happened[i])  
      th <- paste(time_happened[i],oi,sep="")  
      msg<- paste(" ",msg,th,".",sep="")  
    }  
    else if(i==j-1){  
      oi <- ordinal_indicator(time_happened[i])  
      th <- paste(time_happened[i],oi,sep="")  
      msg<- paste(msg," ",th,sep="")  
    }  
    else{  
      oi <- ordinal_indicator(time_happened[i])  
      th <- paste(time_happened[i],oi,sep="")  
      msg<-paste(msg," and ",th,".",sep="")  
    }  
  }  
}
```

```
if(j==1){  
  aux <- "was"  
  verb <- paste(verb,"in ")  
}else{  
  aux <- "were"  
  verb <- paste(verb,"in ")  
}
```

1	fall
2	found
3	happened
4	dropped
5	spilled
6	occurred
7	

# Weather Summary - MonthlyWindMsg

- Input: Windspeed Mean (Last Month)
- Output : MonthlyWindMsg (Almost same with Data interpretation)
- Ex: "[1] "calm" "light air" "light breeze" "gentle breeze" "moderate breeze"
- [6] "fresh breeze" "strong breeze" "near gale" "gale" "strong gale"
- [11] "storm" "violent storm" "Hurricane" "

```
MonthlywindMessage<-function(data){  
  x<-as.double(data["wind.speed"])  
  msg <- Data_Interpreter(windSpeed_interval,  
                           x, "",windSpeed_partition)  
  return(msg)  
}  
MonthlywindMsg<-MonthlywindMessage(LMmean_result)
```

# Weather Summary - WindExtremeMessage

- Input: Windspeed Mean (Last Month)
- Output : " Hurrrricane was occurred in 5th, and 6th."
  - Hurrrricane = Status/Message
  - Was = aux
  - Occurred = verb
  - 5, 6 = date
  - Th = ordinal

```
i=1;
if(j==1){
  aux <- "was"
  verb <- paste(verb,"in ")
}else{
  aux <- "were"
  verb <- paste(verb,"in ")
}
msg<-paste(status,aux,verb)
```

```
1 hapenned
2 found
3 blew
4 wiffed
5 conducted
6 occurred
7 came
8 ensued
9
```

```
for(i in i:j){
  if(j==1){
    oi <- ordinal_indicator(time_happened[i])
    th <- paste(time_happened[i],oi,sep="")
    msg<- paste(" ",msg,th,".",sep="")
  }
  else{
    if(i!=j){
      oi <- ordinal_indicator(time_happened[i])
      th <- paste(time_happened[i],oi,sep="")
      msg<- paste(" ",msg,th,".",sep="")
    }
    else if(i==j-1){
      oi <- ordinal_indicator(time_happened[i])
      th <- paste(time_happened[i],oi,sep="")
      msg<- paste(msg," ",th,sep="")
    }
    else{
      oi <- ordinal_indicator(time_happened[i])
      th <- paste(time_happened[i],oi,sep="")
      msg<-paste(msg," and ",th,".",sep="")
    }
  }
}
```

# Microplanning - Weather Summary

```
[1] " According to the monthly summary result, this month was cooler and wetter than average"
[2] " With average number of rain days, the total rain so far is well above the average "
[3] " There was rain on everyday for 4 days from 27th to 30th and heavy rain were spilled in 28th and 29th"
[4] " The wind for the month was light breeze in average"
[5] " Average air quality was admissible"
[6] " Average temperature was increased but 29 th was the coldest day of the month with 14,5 celcius degree temperature"
```

- Intro
- MonthlyMsg1 <- MonthlyMsg1\_aggregation(MonthlyTempMsg, MonthlyRainfallMsg)
- MonthlyMsg2 <- MonthlyMsg2\_aggregation(RainyDaysMsg, RainSoFarMessage)
- MonthlyMsg3 <- MonthlyMsg3\_aggregation(RainSpellMsg, RainExtremeMsg)
- MonthlyMsg4 <- MonthlyMsg4\_aggregation(MonthlyWindMsg, WindExtremeMsg)
- MonthlyMsg5 <- MonthlyMsg5\_aggregation(MonthlyAQMsg, "")
- MonthlyMsg6 <- Coldest\_day(LMmin\_result, LMmean\_result, MBLMmean\_result)

# Weather Summary – Contrast Lex

- Input: Data interpretation index (Ex: 0, 1, 2, etc)
- Output: Conjunction (And, But)

```
Contrast_lexicalisation1 <- function(msg1,msg2){  
  if(msg1[2]==msg2[2]){  
    return("and")  
  }else{  
    return("but")  
  }  
}
```

# Weather Summary– Intro

- Random:
- "Regarding to the monthly summary result, this month"
- "According to the monthly summary result, this month"
- "Summary result showed that this month"
- "Condition of this month"
- "This month summary showed that the month"

# Weather Summary - MonthlyMsg1

- Output: "was cooler and wetter than average."

```
MonthlyMsg1_aggregation<-function(msg1,msg2){  
  #aggreagation with simple conjunction  
  conj <- Contrast_lexicalisation1(msg1,msg2)  
  print("asdasd")  
  print(msg2[2])  
  print(msg1[2])  
  msg<-paste("was",msg1[1],conj,msg2[1],"than average.")  
  return(msg)  
}  
  
MonthlyMsg1 <- MonthlyMsg1_aggregation(MonthlyTempMsg,MonthlyRainfallMsg)
```

- cooler, 0 = Message1
- And = Conjunction
- wetter, 0 = Message 2

# Weather Summary – MonthlyMsg2

- **Output:** "With average number of rain days, "" the total rain so far is well above the average ."

```
MonthlyMsg2_aggregation<-function(msg1,msg2){  
  #aggreagation with simple conjunction  
  if(msg1[2]!=msg2[2]){  
    contrast<-""  
  }else{  
    contrast<-"accordingly"  
  }  
  msg<-paste("with",msg1[1],"days,",contrast,"the total rain so far is",msg2[1],".")  
  return(msg)  
}  
MonthlyMsg2 <- MonthlyMsg2_aggregation(RainyDaysMsg,RainSoFarMessage)
```

- average number of rain, 0 = message 1
- "" = contrast
- well above the average, 2 = message 2



# Weather Summary – MonthlyMsg3

- **Output:** "There was rain on everyday for 4 days from 27th to 30th and heavy rain were spilled in 28th and 29th."

```
MonthlyMsg3_aggregation<-function(msg1,msg2){  
  if(msg2=="x"){  
    msg<-paste(" There was rain on everyday for ",msg1,". ",sep="")  
  }  
  else if(msg1==""){  
    msg<-msg2  
  }  
  else{  
    msg<-paste("There was rain on everyday for",msg1,"and",msg2)  
  }  
  return(msg)  
}  
MonthlyMsg3 <- MonthlyMsg3_aggregation(RainSpellMsg,RainExtremeMsg)
```

- 4 days from 27th to 30th = message 1
- heavy rain were spilled in 28th and 29th = message 2

# Weather Summary – MonthlyMsg4

- Output: "The wind for the month was light breeze in average, but violent storm were ensued in 5th, and 6th."

```
MonthlyMsg4_aggregation<-function(msg1,msg2){  
  if(msg2=="false"){  
    msg<-paste("The wind for the month was",msg1,"in average.")  
  }  
  else{  
    msg<-paste("The wind for the month was",msg1,"in average, but",msg2)  
  }  
  return(msg)  
}  
MonthlyMsg4 <- MonthlyMsg4_aggregation(MonthlywindMsg,windExtremeMsg)
```

- light breeze = message 1
- violent storm were ensued in 5th, and 6th = message 2

# Weather Summary – MonthlyMsg5

- Output: "Average air quality was **admissible**."

```
MonthlyMsg5_aggregation<-function(msg1,msg2){  
  if(msg2!=""){  
    msg<-paste("Average air quality was",msg1,", although",msg2)  
  }  
  else{  
    msg<-paste("Average air quality was ",msg1,".",sep="")  
  }  
}  
MonthlyMsg5 <- MonthlyMsg5_aggregation(MonthlyAQMsg,"")
```

- **admissible** = message 1

# Weather Summary– Coldest Day

- Input: LM Min Value, LM Mean Value, 2 LM mean Value
- Output: "Average temperature was **increased** **but** **29** **th** was the coldest day of the month with **14.5** celcius degree temperature."

- **Increased** = trend
- **But** = Conj
- **29** = Date
- **Th** = Ordinal
- **14.5** = value

```
coldest_day <- function(LMmin_result,LMmean_result,MBLMmean_result){  
  x<-as.double(LMmean_result["Average.Temperature"])  
  y<-as.double(MBLMmean_result["Average.Temperature"])  
  if(x>y){  
    trend <- "increased"  
    conj <- "but"  
  }  
  else{  
    trend <- "decreased"  
    conj <- "and"  
  }  
  date <- as.character(LMmin_result[3,2])  
  value <- LMmin_result[3,3]  
  oi<-ordinal_indicator(date)  
  dt <- substrRight(date,2)  
  msg<-paste(  
    "Average temperature was",trend,conj,  
    dt,oi," was the coldest day of the month with ",value," celcius degree temperature.")  
}
```