

Air Quality Management System
Textual Diagram Description
v1.0
TheMarpions

1. Use case: *Aggregate Data*

- Context of usage: base operation used to retrieve and elaborate data from .csv files
- System considered: Application
- Main actor: client
- Other actors: database (.csv files)
- Precondition: none
- Success guaranties: data read, filtered, grouped by sensor and collected in a data structure
- Trigger: as soon as the client executes the application
- Nominal scenario:
 1. Client executes the app
 2. The application read the data from the database
 3. The data is elaborated and organized in a data structure
 4. Data is now ready to be used by the other functionalities
- Extensions:
 - Reading error: the files are corrupted, exception is raised and execution is stopped

2. Use case: *Identify Sensors similarity*

- Context of usage: find group of sensors with similar registered data in a certain period of time
- System considered: Application
- Main actor: client
- Other actors: none
- Precondition: client has executed the application so that data have been loaded
- Success guaranties: the application displays the group of similar sensors and their pollutants indexes in the considered period of time
- Trigger: the user clicks on the relative button of the GUI and fill the form, inserting a first date and optionally a second one
- Nominal scenario:
 1. Client clicks on the button 'Identify Sensors Similarity'
 2. Client inserts an initial date and optionally a final one
 3. Client clicks on 'Submit' button
 4. The application displays the group of similar sensors and their indexes next to an explanation table
 5. The user can click 'Home' to return to menu or 'Exit' to close the application

- Extensions:
 - The user can fill the form badly (fields missing or incorrect dates): an error message is displayed and the user can click 'Home' to return to menu and refill the form
 - The user while compiling the form does something wrong: by clicking 'Delete' button the form is erased and the client can restart to fill it
 - The user while compiling the form wants to go back: by clicking 'Home' button user is going back to the general menu

3. **Use case:** *Air Quality Index*

- Context of usage: to find the AQI of a given location during a given time
- System considered: Application
- Main actor: client
- Other actors: none
- Precondition: client has executed the application so that data have been loaded
- Success guaranties: the application displays the AQI
- Trigger: the user clicks on the relative button of the GUI and fill the form, inserting a first date and optionally a second one and a location
- Nominal scenario:
 1. Client clicks on the button 'Find Mean Air Quality'
 2. Client inserts an initial date, optionally a final one, and a location
 3. Client clicks on 'Submit' button
 4. The application displays the AQI next to an explanation table
 5. The user can click 'Home' to return to menu or 'Exit' to close the application
- Extensions:
 - The user can fill the form badly (fields missing or incorrect dates): an error message is displayed and the user can click 'Home' to return to menu and refill the form
 - The user while compiling the form does something wrong: by clicking 'Delete' button the form is erased and the client can restart to fill it
 - The user while compiling the form wants to go back: by clicking 'Home' button user is going back to the general menu

4. **Use case:** *Identify characterizing values*

- Context of usage: to find more details about pollutants on a given location during a given period
- System considered: Application
- Main actor: client
- Other actors: none
- Precondition: client has executed the application so that data have been loaded
- Success guaranties: the application displays the pollutants mean values and their description
- Trigger: the user clicks on the relative button of the GUI and fill the form, inserting a first date and optionally a second one and a location

- Nominal scenario:
 1. Client clicks on the button 'Identify Characterizing Values'
 2. Client inserts an initial date, optionally a final one, and a location
 3. Client clicks on 'Submit' button
 4. The application displays pollutants mean values and their description next to an explanation table
 5. The user can click 'Home' to return to menu or 'Exit' to close the application
- Extensions:
 - The user can fill the form badly (fields missing or incorrect dates): an error message is displayed and the user can click 'Home' to return to menu and refill the form
 - The user while compiling the form does something wrong: by clicking 'Delete' button the form is erased and the client can restart to fill it
 - The user while compiling the form wants to go back: by clicking 'Home' button user is going back to the general menu

5. Use case: *Location Comparison*

- Context of usage: compare two given localities on a given time in terms of air quality
- System considered: Application
- Main actor: client
- Other actors: none
- Precondition: client has executed the application so that data have been loaded
- Success guaranties: the application displays the pollutants indexes of the two selected sensors for making a comparison
- Trigger: the user clicks on the relative button of the GUI and fill the form, inserting a first date and optionally a second one and a location
- Nominal scenario:
 1. Client clicks on the button 'Location Comparison'
 2. Client inserts an initial date, optionally a final one, and two locations
 3. Client clicks on 'Submit' button
 4. The application displays pollutants indexes of the two localities next to an explanation table
 5. The user can click 'Home' to return to menu or 'Exit' to close the application
- Extensions:
 - The user can fill the form badly (fields missing or incorrect dates): an error message is displayed and the user can click 'Home' to return to menu and refill the form
 - The user while compiling the form does something wrong: by clicking 'Delete' button the form is erased and the client can restart to fill it
 - The user while compiling the form wants to go back: by clicking 'Home' button user is going back to the general menu