# Francisco Javier Lozano Gonzalez

# Problem Identification And Requirements Analysis

## Case Study:

|  |  |
| --- | --- |
| Customer | Barney Stinson |
| User | Barney Stinson Clients |
| Context of the problem | *[Detail in general terms the situation with the elements that interact to comply with the functionalities of the software, including the features and restrictions that are not explicit and necessary.]*  *Barney Stinson (client), looking for an application that offers a menu with various functionalities. First, the application must allow the storage of galaxies, with a maximum limit of 50 galaxies. Each recorded galaxy must include information, such as its name, the distance separating it from Earth and its shape, which can be elliptical, spiral, lenticular or irregular.*  *In addition, the application must have an option that allows users to view all registered galaxies. This function will display the name of each galaxy along with its distance from Earth measured in light years.*  *The application should also offer the possibility to consult detailed information about a specific galaxy. To do this, the user will simply enter the name of the galaxy in question, and the application will display all the attributes associated with that galaxy, including its name, distance from Earth and shape.*  *Finally, the application must include an option that allows you to eliminate previously registered galaxies making them or can be seen or consulted.* |
| Functional requirements | 1. Menu 2. Create Galaxy 3. Add Photo Galaxy 4. Info Galaxy 5. Delete Galaxy 6. Create Black Hole 7. Add Photo Black Hole // Add Photo Method-choose Which Object 8. Info Black Hole 9. Create Planet 10. Add Photo Planet 11. Info Planet 12. Modify Planet Information 13. Delete Planet 14. Galaxy With More Distance To Earth 15. Info Planet With The Highest Density 16. Info Telescope |
| Non-functional requirements | 1. No more than 50 galaxies can be stored. 2. No more than 20 planets can be stored. 3. Galaxies cannot have more than 30 photos. 4. Black holes cannot have more than 5 photos. 5. Planets cannot have more than 50 photos. 6. The menu is always shown. 7. The program must have test cases. |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Identifier and name | *[RF1-Menu]* | | | |
| Summary | *The system should display a menu with the options of:*   1. *Create* *galaxy* 2. *Info Galaxy* 3. *Delete* *galaxy* 4. *Info Black Hole* 5. *Info Planet* 6. *Modify Planet Information* 7. *Delete Planet* 8. *Galaxy farthest away to Earth* 9. *Most Dense Planet* 10. *Telescope that has taken the most photos* 11. *exit*   *In case of entering invalid value, the program will show an error message and request again the information, otherwise, according to the user inputs the program will get the user to its chosen option.* | | | |
| Inputs | **Input name** | **Data type** | | **Valid values condition** |
| election | Int | | *Values equal to 1 2 3 ...10* |
| Result or Postcondition |  | | | |
| Outputs | **Exit** **name** | | **Data type** | **Format** |
| Error message | | String | *"Invalid value, please type valid value (1,2,3,4)"* |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Identifier and name | *[RF2-Create Galaxy]* | | | |
| Summary | *The system must* *allow to add galaxies, for which it will be requested to enter its respective name, distance to the earth (in light years) and its shape, in the last mentioned the user will select between elliptical, spiral, lenticular and irregular. The galaxy will be saved with its respective information; This information will be attached to an array with a maximum of 50 galaxies.*  *If the number of galaxies is greater than 50 it will show the galaxy limit message reached*  *In case of adding invalid values, it will show an invalidity message and the user will be asked for the data again; otherwise Save confirmation.*  *In addition, in case of repeating the name of a galaxy, a repeat message will be displayed.* | | | |
| Inputs | **Input name** | **Data type** | | **Valid values condition** |
| Name | String | | *N/A* |
| distance | Double | | *Numeric value* |
| form | Int | | 1. *Elliptical* 2. *Spiral* 3. *Lenticular* 4. *Irregular* |
| Result or Postcondition | The galaxy is recorded along with its information in arrays. | | | |
| Outputs | **Exit** **name** | | **Data type** | **Format** |
| Invalid data message | | String | "Invalid data or galaxy repeated, please try again." |
| Confirmation message | | String | "Galaxy saved successfully. " |
| Limit message completed. | | String | "The limit of galaxies has been reached." |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Identifier and name | *[RF3-Add Photo Galaxy]* | | | |
| Summary | *The system adds and links a photo to a selected galaxy (maximum 50 photos), asking the user for the image URL, the telescope name and the date in which the photo was taken.* | | | |
| Inputs | **Input name** | **Data type** | | **Valid values condition** |
| **URL** | **String** | | **It is a photo url in the repository.** |
| **Telescope name** | **String** | | **NA** |
| **Date** | **Calendar** | | **Cannot be a future date.** |
| Result or Postcondition | The system proceeds to save the information and count a photo to the number of galaxy photos.  The user receives a message of the state of the process (Confirmation or Error) | | | |
| Outputs | **Exit** **name** | | **Data type** | **Format** |
| Message Cofirmation | | String | "Photo saved successfully." |
| Message Error | | String | “Error, some data is invalid.” |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Identifier and name | *[RF4-Info Galaxy]* | | | |
| Summary | *The system must allow querying for a specific galaxy; For this the user will be asked to enter the name of the galaxy, from that name will be searched in the galaxies registered so far.*  *In case of finding the galaxy, the name of the galaxy, its distance from planet earth and its shape will be displayed on the screen.*  *In case of not finding the galaxy, the program will show galaxy not found message.* | | | |
| Inputs | **Input name** | **Data type** | | **Valid values condition** |
| Galaxy\_Name | String | | *Must be previously* *registered* |
| Result or Postcondition | The galaxy found from the name is displayed on the screen, in case of not finding it shows warning message. | | | |
| Outputs | **Exit** **name** | | **Data type** | **Format** |
| Galaxy not found message | | String | *"The galaxy has not been found, it may be that you mistyped the name or it is not in the* *database"* |
| galaxy | | String | "Galaxy name  The galaxy is at a distance of ---- from Earth.  The galaxy has a ---" shape. |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Identifier and name | *[RF5-Delete Galaxy]* | | | |
| Summary | *The system must allow the user to remove a galaxy from the database for this, the user will be asked for the name of the galaxy to delete.*  *If the galaxy is found, show the confirmation message and the galaxy will be hidden so that it can no longer be seen or consulted (change his attributes to NULL). And confirmation message will be* *displayed*  *In case of not* *finding it show galaxy not found message* | | | |
| Inputs | **Input name** | **Data type** | | **Valid values condition** |
| Galaxy Name | String | | *Must be in the database.* |
| Result or Postcondition | The galaxy will be hidden (change his attributes to NULL) along with its respective information. | | | |
| Outputs | **Exit** **name** | | **Data type** | **Format** |
| Galaxy not found message. | | String | *"The galaxy has not been found, it may be that you mistyped the name or it is not in the database."* |
| Confirmation message | | String | "Galaxy eliminated successfully." |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Identifier and name | *[RF6-Create Black Hole]* | | | |
| Summary | *The system must allow to add black holes, for which it will be requested to enter their respective name, mass, distances to planet Earth, their charge and rotation. The black hole will be saved with its respective information; in addition, according to the charge and rotation entered (Schwarzschild, Reissner-Nordstrøm, Kerr or Kerr-Newman), the type will be saved; this information will be attached to an array.*  *In case of adding invalid values, it will show an invalidity message and you will be asked for the data again; otherwise Save confirmation.* | | | |
| Inputs | **Input name** | **Data type** | | **Valid values condition** |
| name | String | | *N/A* |
| mass | double | | *Must be a number.* |
| distance | double | | *Must be a number.* |
| charge | boolean | | 1. *Has charge.* 2. *Has no charge.* |
| rotation | boolean | | *1.Rotate*  *2.Not rotate* |
|  |  | |  |
| Result or Postcondition | the black hole will be saved with the attributes, name, mass, distance, charge, rotation, and type (according to charge and rotation; *Schwarzschild, Reissner-Nordstrøm, Kerr or Kerr-Newman*). | | | |
| Outputs | **Exit** **name** | | **Data type** | **Format** |
| Invalid data message | | String | "Invalid data, please enter them again." |
| Confirmation message | | String | "Black Hole saved successfully." |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Identifier and name | *[RF7-Add Photo Black Hole]* | | | |
| Summary | *The system adds and links a photo to a selected black hole and saves it (maximum 5 photos), asking the user for the image URL, the telescope name, and the date in which the photo was taken.* | | | |
| Inputs | **Input name** | **Data type** | | **Valid values condition** |
| **URL** | **String** | | **It is a photo URL in the repository.** |
| **Telescope name** | **String** | | **NA** |
| **Date** | **Calendar** | | **Cannot be a future date.** |
| Result or Postcondition | The system proceeds to save the information and count a photo to the number of black hole photos.  The user receives a message of the state of the process (Confirmation or Error) | | | |
| Outputs | **Exit** **name** | | **Data type** | **Format** |
| Message Cofirmation | | String | "Photo saved successfully." |
| Message Error | | String | “Error, some data is invalid.” |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Identifier and name | *[RF8-Info Black Hole]* | | | |
| Summary | *The system must allow the query of a specific Black Hole; to do so, the user will be asked to enter the type of Black Hole, the user will have 4 options (Schwarzschild, Reissner-Nordstrøm, Kerr or Kerr-Newman), from that type the Black Holes registered so far in the galaxies that match the type will be searched.*  *If a match is found with a black hole in a galaxy, the name of the galaxy, and the name of the Black Hole in it, will be displayed on the screen, that operation for all matches.*  *In case of not finding any match with this type of Black Hole, a message of Black Hole type not found will be displayed.* | | | |
| Inputs | **Input name** | **Data type** | | **Valid values condition** |
| *Black Hole* Type | Int | | 1. *Schwarzschild* 2. *Reissner-Nordstrøm* 3. *Kerr* 4. *Kerr-Newman* |
| Result or Postcondition | All the names of the galaxies with the selected type of black hole will be displayed on the screen, as well as the name of the black hole in each one. | | | |
| Outputs | **Exit** **name** | | **Data type** | **Format** |
| *Black Hole* not found message. | | String | *"No Black Hole has been found; it may be that there is no galaxy with this type of black hole in the database."* |
| *Black Hole* | | String | "´Galaxy name´ with Black Hole ´name Black Hole´ |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Identifier and name | *[RF9-Create Planet]* | | | |
| Summary | *The system must allow the user to add planets, for which it will be requested to enter its respective name, number of satellites,* *radium and mass. The planet will be saved with its respective information; This information will be attached to an array with a maximum of 20 planets.*  *If the number of planets is greater than 20 it will show the galaxy limit reached message.*  *In case of adding invalid values, it will show an invalidity message and you will be asked for the data again; otherwise Save confirmation.*  *In addition, in case of repeating the name of a planet in the same galaxy, a repeated message will be displayed.* | | | |
| Inputs | **Input name** | **Data type** | | **Valid values condition** |
| Name | String | | *N/A* |
| Satellites Number | Int | | *Must be an integer.* |
| radium | double | | *Must be a number.* |
| mass | double | | *Must be a number.* |
| Result or Postcondition | The planet is recorded along with its information in arrays. | | | |
| Outputs | **Exit** **name** | | **Data type** | **Format** |
| Invalid data message | | String | "Invalid data or planet repeat, please try again." |
| Confirmation message | | String | "Planet saved successfully." |
| Limit message completed. | | String | "The limit of planets has been reached." |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Identifier and name | *[RF10-Add Photo Planet]* | | | |
| Summary | *The system adds and links a photo to a selected planet and saves it (maximum 30 photos), asking the user for the image URL, the telescope* *name and the date in which the photo was taken.* | | | |
| Inputs | **Input name** | **Data type** | | **Valid values condition** |
| **URL** | **String** | | **It is a photo URL in the repository.** |
| **Planet name** | **String** | | **NA** |
| **Date** | **Calendar** | | **Cannot be a future date.** |
| Result or Postcondition | The system proceeds to save the information and count a photo to the number of planet photos.  The user receives a message of the state of the process (Confirmation or Error) | | | |
| Outputs | **Exit** **name** | | **Data type** | **Format** |
| Message Cofirmation | | String | "Photo saved successfully." |
| Message Error | | String | “Error, some data is invalid.” |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Identifier and name | *[RF11-Info Planet]* | | | |
| Summary | *The system must allow the query of a specific planet; to do so, the user will be asked to enter the name of the planet, from that name the planet registered so far in the galaxies will be printed on the screen with his attributes, volume, density, and its photos.*  *If a match is found with a planet in a galaxy, the planet information will be displayed.*    *In case no match to this planet is found, a planet not found message will be displayed.* | | | |
| Inputs | **Input name** | **Data type** | | **Valid values condition** |
| *Planet name* | String | | *N/A* |
| Result or Postcondition | The attributes of the planet (name, number of satellites, radius, mass, density, volume and photos) will be displayed on the screen. | | | |
| Outputs | **Exit** **name** | | **Data type** | **Format** |
| *Planet not found* message. | | String | *"No planet has been found, it may be that a planet with this name does not exist or there are no planets in the database."* |
| *planet* | | String | "Name, have ´satellites number´ of satellites, have radium ´radium´, have mass ´mass´, have volume ´and have volume ´volume´ his photos are... “ |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Identifier and name | *[RF12-Modify planet information]* | | | |
| Summary | *The system must* *allow to modify some planet previously registered, for which it will be requested to enter its respective name of the galaxy and name of the planet to search for it and later index the modified number of satellites,* *radium and mass. Users cannot change the name of the planet. The planet will be saved with its respective information.*  *In case of adding invalid values, it will show an invalidity message and you will be asked for the data again; otherwise Save confirmation.* | | | |
| Inputs | **Input name** | **Data type** | | **Valid values condition** |
| Name Galaxy | String | | *Must be in the database.* |
| Name planet | String | | *Must be in the database.* |
| New Satellites Number | Int | | *Must be an integer.* |
| New radium | double | | *Must be a number.* |
| New mass | double | | *Must be a number.* |
| Result or Postcondition | The planet is modified and stored in arrays in the same original position. | | | |
| Outputs | **Exit** **name** | | **Data type** | **Format** |
| Invalid data message | | String | "Invalid data, please enter them again." |
| Confirmation message | | String | "Planet updated successfully." |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Identifier and name | *[RF13-Delete Planet]* | | | |
| Summary | *The system must allow the user to remove a planet from the database for this, the user will be asked for the name of the planet to delete it.*  *If the planet is found, the program will show a confirmation message and the planet will be hidden so that it can no longer be seen or consulted (change his attributes to NULL).*  *In case of not finding it, the program will show planet not found message.* | | | |
| Inputs | **Input name** | **Data type** | | **Valid values condition** |
| Planet Name | String | | *Must be in the database.* |
| Result or Postcondition | The galaxy will be hidden (change his attributes to NULL) along with its respective information. | | | |
| Outputs | **Exit** **name** | | **Data type** | **Format** |
| Planet not found message. | | String | *"The Planet has not been found, it may be that you mistyped the name or it is not in the database."* |
| Confirmation message | | String | "Planet eliminated successfully." |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Identifier and name | *[RF14- Galaxy* with more distance To Earth] | | | |
| Summary | *The system should display the name of the planet with the highest distance to the Earth recorded so far.*  *If it has data, print a message with the name of the planet with more distance to Earth, otherwise it will show a message of no data recorded so far.* | | | |
| Inputs | **Input name** | **Data type** | | **Valid values condition** |
| Result or Postcondition | Message is displayed with the name of the planet with the most distance to Earth recorded so far. | | | |
| Outputs | **Exit** **name** | | **Data type** | **Format** |
| Hight Distance | | String | “The planet with the highest distance to Earth is...” |
| No data | | String | “No planets registered so far.” |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Identifier and name | *[RF15-* Info Planet With The Highest Density*]* | | | |
| Summary | *The system should display the name of the planet with the highest density recorded so far.*  *If data is found, a message will be printed with the name of the planet with the highest density, otherwise it will show a message of no data recorded so far.* | | | |
| Inputs | **Input name** | **Data type** | | **Valid values condition** |
| Result or Postcondition | Message is displayed with the name of the planet with the highest density recorded so far. | | | |
| Outputs | **Exit** **name** | | **Data type** | **Format** |
| Hight Density | | String | “The planet with the highest density is...” |
| No data | | String | “No planets registered so far.” |
|  | |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Identifier and name | *[RF16- Info Telescope]* | | | |
| Summary | *The system shows the name of the telescope with the highest number of photos taken.* | | | |
| Inputs | **Input name** | **Data type** | | **Valid values condition** |
| **Photos** | **Int** | | **Must be a positive number.** |
| **Telescope name** | **String** | | **NA** |
| Result or Postcondition | The system proceeds to show the name and number of photos of the telescope according to the conditions established. | | | |
| Outputs | **Exit** **name** | | **Data type** | **Format** |
| Message Cofirmation | | String | "Hubble, has 10000photos taken.” |
| Message Error | | String | “Error, there are no photos taken.” |

Tor