**Highlights\***

1. Include 3 to 5 bullet points that convey the main findings of the work.
2. Methods and results are not “findings,” so they should not appear as highlights.
3. Bullets are limited to a maximum of 85 characters, including spaces.
4. Bullets should be complete sentences, not sentence fragments.
5. Highlights should be able to stand alone, so avoid acronyms or specialized terms.

\* Please note: Highlights are not part of the manuscript document but should be submitted in a separate editable file in the online submission system.  Please use “Highlights” in the file name.

Also, in the submission’s cover letter, authors should clearly state what are the key contributions of their work and why their contributions are novel and worthy of journal consideration.

**DICAUVACCOP: a software tool to calculate and visualize differentiate payment according to grape quality**

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**Annex A**

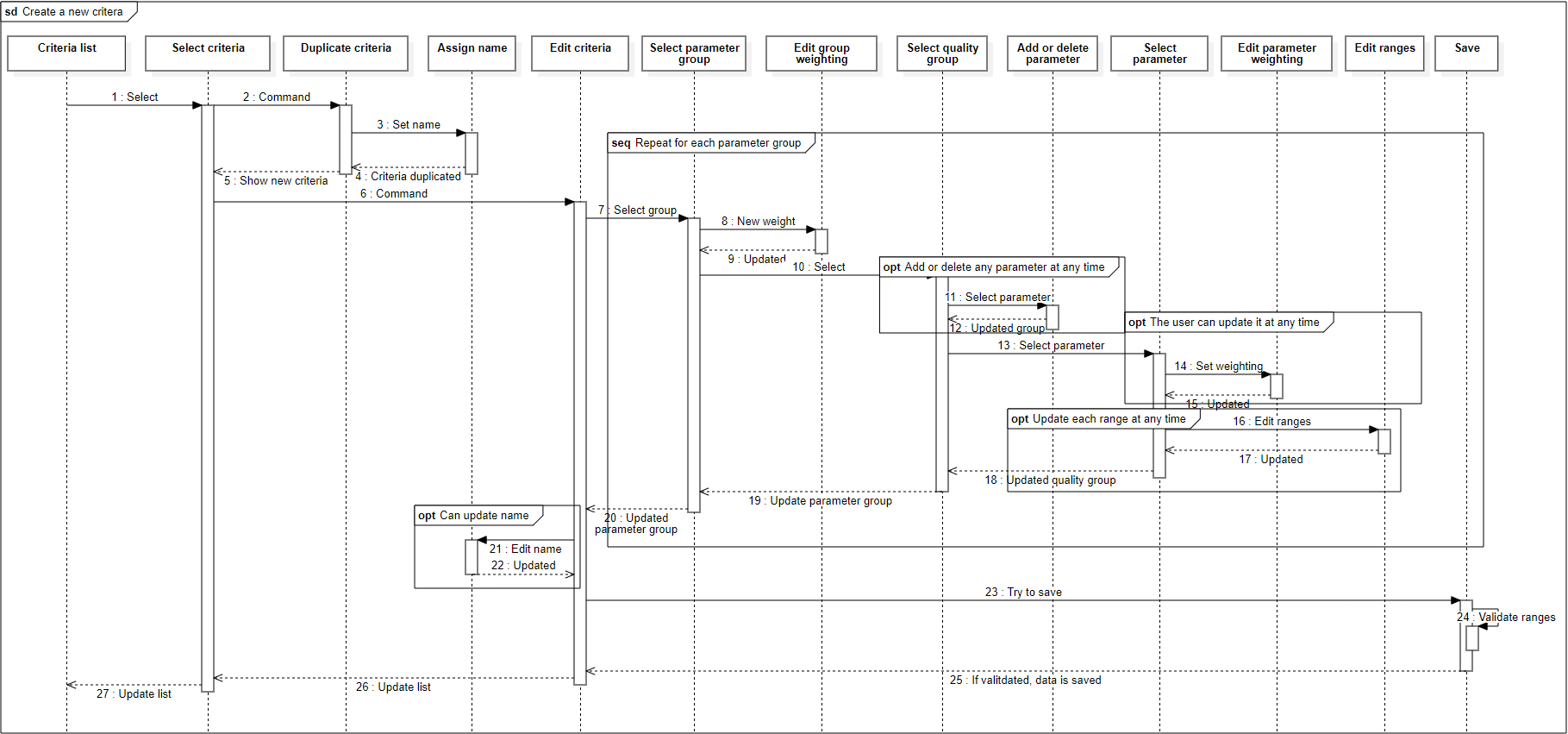


Fig A. 1 Sequence diagram for creating new criteria.

**Diagrama

Descripción generada automáticamente**

Fig A. 2: Sequence diagram for calculating the quality of a campaign.

**Interfaz de usuario gráfica, Aplicación

Descripción generada automáticamente**

Fig A. 3: Sequence diagram for calculating the differentiated payment for a campaign based on quality.

**Annex B**

B.1 Quality calculation example using Kilo-point Criteria on Red Quality Group.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Quality Group: **Red** | | | | | | | | | | |
|  | **70%**  **Alcoholic Content** | | | **15%**  **pH** | | | **15%**  **Total Acidity** | | |  |
| Range | Score | Weighted Score | Range | Score | Weighted Score | Range | Score | Weighted Score | **Maturity Score** |
| R1 | 15 - 15,99 | 6 | **4,2** | 3,6 - 3,69 | 8 | **1,2** | 4,8 - 4,89 | 9 | **1,35** | **6,75** |
| R2 | 13 - 13,99 | 10 | **7** | 2,9 - 2,99 | 8 | **1,2** | 4,9 - 4,99 | 9,5 | **1,425** | **9,625** |
| R3 | 12 - 12,99 | 9 | **6,3** | 3 - 3,59 | 10 | **1,5** | 4,3 - 4,39 | 6,5 | **0,975** | **8,775** |
| R4 | 10 - 10,99 | 2 | **1,4** | 2,8 - 2,89 | 6 | **0,9** | 3,8 - 3,89 | 4 | **0,6** | **2,9** |
| R5 | 17 - 100 | 0 | **0** | 3 - 3,99 | 2 | **0,3** | 3 - 3,49 | 2 | **0,3** | **0,6** |

Table B. 1: Maturity score for red quality group in test cases.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Quality Group: **Red** | | | | |
|  | **100 % Gluconic Acid** | | |  |
|  | Range | Score | Weighted Score | **Health Score** |
| R1 | 0,61 - 0,7 | 9 | **1** | **1** |
| R2 | 0 - 0,5 | 10 | **0** | **0** |
| R3 | 0,91 - 1 | 7,5 | **2,5** | **2,5** |
| R4 | 1,21 - 1,3 | 4,5 | **5,5** | **5,5** |
| R5 | 2,01 - 5 | 0 | **10** | **10** |

Table B. 2: Health score for red quality group in test cases.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Maturity | 100%** | | **Health | -20%** | |  |
| Ticket | Score | Weighted Score | Score | Weighted Score | **Final Score** |
| R1 | 6,75 | **6,75** | 1 | **-0,2** | **6,55** |
| R2 | 9,625 | **9,625** | 0 | **0** | **9,625** |
| R3 | 8,775 | **8,775** | 2,5 | **-0,5** | **8,275** |
| R4 | 2,9 | **2,9** | 5,5 | **-1,1** | **1,8** |
| R5 | 0,6 | **0,6** | 10 | **-2** | **0** |

Table B. 3: Final quality score for Red Quality group in test cases.

B.2 Quality calculation example using Kilo-point Criteria on White Quality Group.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Quality Group: **White** | | | | | | | | | | |
|  | **70%**  **Alcoholic Content** | | | **15%**  **pH** | | | **15%**  **Total Acidity** | | |  |
| Range | Score | Weighted Score | Range | Score | Weighted Score | Range | Score | Weighted Score | **Maturity Score** |
| w1 | 12,5 - 13,49 | 9 | **6,3** | 2,9 - 2,99 | 8 | **1,2** | 4,8 - 4,89 | 9 | **1,35** | **8,85** |
| w2 | 11,5 - 12,49 | 10 | **7** | 3 - 3,59 | 10 | **1,5** | 4,7 - 4,79 | 8,5 | **1,275** | **9,775** |
| w3 | 10,5 - 11,49 | 9 | **6,3** | 2,7 - 2,79 | 4 | **0,6** | 4,2 - 4,29 | 6 | **0,9** | **7,8** |
| w4 | 14,5 - 15,49 | 2 | **1,4** | 3,6 - 3,69 | 8 | **1,2** | 3,8 - 3,89 | 4 | **0,6** | **3,2** |
| w5 | 0 - 8,49 | 0 | **0** | 3 - 3,99 | 2 | **0,3** | 3,9 - 3,99 | 4,5 | **0,675** | **0,975** |

Table B. 4: Maturity score for White quality group in test cases.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Quality Group: **White** | | | | |
|  | **100 % Gluconic Acid** | | |  |
|  | Range | Score | Weighted Score | **Health Score** |
| W1 | 0,71 - 0,8 | 8,5 | **1,5** | **1,5** |
| W2 | 0 - 0,5 | 10 | **0** | **0** |
| W3 | 0,91 - 1 | 7,5 | **2,5** | **2,5** |
| W4 | 0,61 - 0,7 | 9 | **1** | **1** |
| W5 | 1,51 - 2 | 1,5 | **8,5** | **8,5** |

Table B. 5: Health score for White quality group in test cases.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Maturity | 100%** | | **Health | -20%** | |  |
| Ticket | Score | Weighted Score | Score | Weighted Score | **Final Score** |
| W1 | 8,85 | **8,85** | 1,5 | **-0,3** | **8,55** |
| W2 | 9,775 | **9,775** | 0 | **0** | **9,775** |
| W3 | 7,8 | **7,8** | 2,5 | **-0,5** | **7,3** |
| W4 | 3,2 | **3,2** | 1 | **-0,2** | **3** |
| W5 | 0,975 | **0,975** | 8,5 | **-1,7** | **0** |

Table B. 6: Final quality score for White Quality group in test cases.

B.3 Quality calculation example using traditional criteria on Red Quality Group.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Quality Group: **Red** | | | | |
|  | **100 % Alcoholic Content** | | |  |
|  | Range | Score | Weighted Score | **Maturity Score** |
| R1 | 15 - 15,99 | 6 | **6** | **6** |
| R2 | 13 - 13,99 | 10 | **10** | **10** |
| R3 | 12 - 12,99 | 9 | **9** | **9** |
| R4 | 10 - 10,99 | 2 | **2** | **2** |
| R5 | 17 - 100 | 0 | **0** | **0** |

Table B. 7: Maturity score for red quality group in test cases.

B.4 Quality calculation example using traditional criteria on White Quality Group.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Quality Group: **White** | | | | |
|  | **100 % Alcoholic Content** | | |  |
|  | Range | Score | Weighted Score | **Maturity Score** |
| W1 | 12,5 - 13,49 | 9 | **9** | **9** |
| W2 | 11,5 - 12,49 | 10 | **10** | **10** |
| W3 | 10,5 - 11,49 | 9 | **9** | **9** |
| W4 | 14,5 - 15,49 | 2 | **2** | **2** |
| W5 | 0 - 8,49 | 0 | **0** | **0** |

Table B. 8: Maturity score for White quality group in test cases.

B.5 Quality calculation example using traditional criteria and health on Red Quality Group.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Quality Group: **Red** | | | | |
|  | **100 % Gluconic Acid** | | |  |
|  | Range | Score | Weighted Score | **Health Score** |
| R1 | 0,61 - 0,7 | 9 | **1** | **1** |
| R2 | 0 - 0,5 | 10 | **0** | **0** |
| R3 | 0,91 - 1 | 7,5 | **2,5** | **2,5** |
| R4 | 1,21 - 1,3 | 4,5 | **5,5** | **5,5** |
| R5 | 2,01 - 5 | 0 | **10** | **10** |

Table B. 9: Health score for red quality group in test cases.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Maturity | 100%** | | **Health | -20%** | |  |
| Ticket | Score | Weighted Score | Score | Weighted Score | **Final Score** |
| R1 | 6 | **6** | 1 | **-0,2** | **5,8** |
| R2 | 10 | **10** | 0 | **0** | **10** |
| R3 | 9 | **9** | 2,5 | **-0,5** | **8,5** |
| R4 | 2 | **2** | 5,5 | **-1,1** | **0,9** |
| R5 | 0 | **0** | 10 | **-2** | **0** |

Table B. 10: Quality score for red quality group in test cases.

B.6 Quality calculation example using traditional criteria and health on White Quality Group.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Quality Group: **White** | | | | |
|  | **100 % Gluconic Acid** | | |  |
|  | Range | Score | Weighted Score | **Health Score** |
| W1 | 0,71 - 0,8 | 8,5 | **1,5** | **1,5** |
| W2 | 0 - 0,5 | 10 | **0** | **0** |
| W3 | 0,91 - 1 | 7,5 | **2,5** | **2,5** |
| W4 | 0,61 - 0,7 | 9 | **1** | **1** |
| W5 | 1,51 - 2 | 1,5 | **8,5** | **8,5** |

Table B. 11: Health score for White quality group in test cases.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Maturity | 100%** | | **Health | -20%** | |  |
| Ticket | Score | Weighted Score | Score | Weighted Score | **Final Score** |
| R1 | 9 | **9** | 1,5 | **-0,3** | **8,7** |
| R2 | 10 | **10** | 0 | **0** | **10** |
| R3 | 9 | **9** | 2,5 | **-0,5** | **8,5** |
| R4 | 2 | **2** | 1 | **-0,2** | **1,8** |
| R5 | 0 | **0** | 8,5 | **-1,7** | **0** |

Table B. 12: Quality score for White quality group in test cases.

B.7 Quality ranges for Alcoholic Content.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Alcoholic Content** | | | | | |
| **White** | | | **Red** | | |
| **Min** | **Max** | **Score** | **Min** | **Max** | **Score** |
| 15,5 | 100 | 0 | 17 | 100 | 0 |
| 14,5 | 15,49 | 2 | 16 | 16,99 | 2 |
| 13,5 | 14,49 | 6 | 15 | 15,99 | 6 |
| 12,5 | 13,49 | 9 | 14 | 14,99 | 9 |
| 11,5 | 12,49 | 10 | 13 | 13,99 | 10 |
| 10,5 | 11,49 | 9 | 12 | 12,99 | 9 |
| 9,5 | 10,49 | 6 | 11 | 11,99 | 6 |
| 8,5 | 9,49 | 2 | 10 | 10,99 | 2 |
| 0 | 8,49 | 0 | 0 | 9,99 | 0 |

Table B. 13: Alcoholic content ranges used in standard criteria for Red and White quality groups.

B.8 Quality ranges for pH.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **pH** | | | | | |
| **White** | | | **Red** | | |
| **Min** | **Max** | **Score** | **Min** | **Max** | **Score** |
| 4 | 100 | 0 | 4 | 100 | 0 |
| 3,9 | 3,99 | 2 | 3,9 | 3,99 | 2 |
| 3,8 | 3,89 | 4 | 3,8 | 3,89 | 4 |
| 3,7 | 3,79 | 6 | 3,7 | 3,79 | 6 |
| 3,6 | 3,69 | 8 | 3,6 | 3,69 | 8 |
| 3 | 3,59 | 10 | 3 | 3,59 | 10 |
| 2,9 | 2,99 | 8 | 2,9 | 2,99 | 8 |
| 2,8 | 2,89 | 6 | 2,8 | 2,89 | 6 |
| 2,7 | 2,79 | 4 | 2,7 | 2,79 | 4 |
| 0 | 2,69 | 0 | 0 | 2,69 | 0 |

Table B. 14: pH ranges used in standard criteria for Red and White quality groups.

B.9 Quality ranges for Total Acidity

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Total Acidity** | | | | | |
| **White** | | | **Red** | | |
| **Min** | **Max** | **Score** | **Min** | **Max** | **Score** |
| 5 | 100 | 10 | 5 | 100 | 10 |
| 4,9 | 4,99 | 9,5 | 4,9 | 4,99 | 9,5 |
| 4,8 | 4,89 | 9 | 4,8 | 4,89 | 9 |
| 4,7 | 4,79 | 8,5 | 4,7 | 4,79 | 8,5 |
| 4,6 | 4,69 | 8 | 4,6 | 4,69 | 8 |
| 4,5 | 4,59 | 7,5 | 4,5 | 4,59 | 7,5 |
| 4,4 | 4,49 | 7 | 4,4 | 4,49 | 7 |
| 4,3 | 4,39 | 6,5 | 4,3 | 4,39 | 6,5 |
| 4,2 | 4,29 | 6 | 4,2 | 4,29 | 6 |
| 4,1 | 4,19 | 5,5 | 4,1 | 4,19 | 5,5 |
| 4 | 4,09 | 5 | 4 | 4,09 | 5 |
| 3,9 | 3,99 | 4,5 | 3,9 | 3,99 | 4,5 |
| 3,8 | 3,89 | 4 | 3,8 | 3,89 | 4 |
| 3,7 | 3,79 | 3,5 | 3,7 | 3,79 | 3,5 |
| 3,6 | 3,69 | 3 | 3,6 | 3,69 | 3 |
| 3,5 | 3,59 | 2,5 | 3,5 | 3,59 | 2,5 |
| 3 | 3,49 | 2 | 3 | 3,49 | 2 |
| 0 | 2,99 | 0 | 0 | 2,99 | 0 |

Table B. 15: Total acidity ranges used in standard criteria for Red and White quality groups.

B.10 Quality ranges for Gluconic acid

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Gluconic acid** | | | | | |
| **White** | | | **Red** | | |
| **Min** | **Max** | **Score** | **Min** | **Max** | **Score** |
| 0 | 0,5 | 10 | 0 | 0,5 | 10 |
| 0,51 | 0,6 | 9,5 | 0,51 | 0,6 | 9,5 |
| 0,61 | 0,7 | 9 | 0,61 | 0,7 | 9 |
| 0,71 | 0,8 | 8,5 | 0,71 | 0,8 | 8,5 |
| 0,81 | 0,9 | 8 | 0,81 | 0,9 | 8 |
| 0,91 | 1 | 7,5 | 0,91 | 1 | 7,5 |
| 1,01 | 1,1 | 6,5 | 1,01 | 1,1 | 6,5 |
| 1,11 | 1,2 | 5,5 | 1,11 | 1,2 | 5,5 |
| 1,21 | 1,3 | 4,5 | 1,21 | 1,3 | 4,5 |
| 1,31 | 1,4 | 3,5 | 1,31 | 1,4 | 3,5 |
| 1,41 | 1,5 | 2,5 | 1,41 | 1,5 | 2,5 |
| 1,51 | 2 | 1,5 | 1,51 | 2 | 1,5 |
| 2,01 | 5 | 0 | 2,01 | 5 | 0 |

Table B. 16: Gluconic acid ranges used in standard criteria for Red and White quality group