**Model Development Phase Template**

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| --- | --- |
| Date | 11 July 2024 |
| Team ID | SWTID1720092248 |
| Project Title | Revolutionizing Liver Care: Predicting Liver Cirrhosis Using Advanced Machine Learning Techniques |
| Maximum Marks | 5 Marks |

**Feature Selection Report Template**

In the forthcoming update, each feature will be accompanied by a brief description. Users will indicate whether it's selected or not, providing reasoning for their decision. This process will streamline decision-making and enhance transparency in feature selection.

|  |  |  |  |
| --- | --- | --- | --- |
| **Feature** | **Description** | **Selected (Yes/No)** | **Reasoning** |
| Age | |  | | --- | | Age of the patient |  |  | | --- | |  | | |  | | --- | | Yes |  |  | | --- | |  | | |  | | --- | | Age is a critical factor in determining health conditions, including liver cirrhosis. |  |  | | --- | |  | |
| Gender | |  | | --- | | Gender of the patient |  |  | | --- | |  | | |  | | --- | | Yes |  |  | | --- | |  | | |  | | --- | | Gender can influence the likelihood of certain diseases, including liver conditions. |  |  | | --- | |  | |
| |  | | --- | | Place |  |  | | --- | |  | | |  | | --- | | Location where the patient lives (rural/urban) |  |  | | --- | |  | | No | |  | | --- | | Place was not directly correlated with the target variable in initial exploratory analysis. |  |  | | --- | |  | |
| Duration | |  | | --- | | Duration of alcohol consumption (years) |  |  | | --- | |  | | |  | | --- | | Yes |  |  | | --- | |  | | |  | | --- | | Long-term alcohol consumption is a significant risk factor for liver cirrhosis. |  |  | | --- | |  | |
| Quantity | |  | | --- | | Quantity of alcohol consumption (quarters/day) |  |  | | --- | |  | | |  | | --- | | Yes |  |  | | --- | |  | | |  | | --- | | The amount of alcohol consumed is directly related to liver damage and cirrhosis risk. |  |  | | --- | |  | |
| Type | |  | | --- | | Type of alcohol consumed |  |  | | --- | |  | | |  | | --- | | Yes |  |  | | --- | |  | | |  | | --- | | Different types of alcohol can have varying effects on the liver. |  |  | | --- | |  | |
| |  | | --- | | Hepatitis B |  |  | | --- | |  | | |  | | --- | | Hepatitis B infection status |  |  | | --- | |  | | |  | | --- | | Yes |  |  | | --- | |  | | |  | | --- | | Hepatitis B is a known risk factor for liver cirrhosis. |  |  | | --- | |  | |
| |  | | --- | | Hepatitis C |  |  | | --- | |  | | |  | | --- | | Hepatitis C infection status |  |  | | --- | |  | | |  | | --- | | Yes |  |  | | --- | |  | | |  | | --- | | Hepatitis C is also a known risk factor for liver cirrhosis. |  |  | | --- | |  | |
| Diabetes | |  | | --- | | Diabetes status |  |  | | --- | |  | | |  | | --- | | Yes |  |  | | --- | |  | | |  | | --- | | Diabetes is associated with metabolic conditions that can affect liver health. |  |  | | --- | |  | |
| |  | | --- | | Blood Pressure |  |  | | --- | |  | | Blood pressure (mmHg) | No | |  | | --- | | Initial analysis showed no significant correlation with liver cirrhosis. |  |  | | --- | |  | |
| Obesity | |  | | --- | | Obesity status |  |  | | --- | |  | | |  | | --- | | Yes |  |  | | --- | |  | | |  | | --- | | Obesity is a significant risk factor for liver disease, including cirrhosis. |  |  | | --- | |  | |
| |  | | --- | | Family History |  |  | | --- | |  | | |  | | --- | | Family history of cirrhosis/hereditary factors |  |  | | --- | |  | | |  | | --- | | Yes |  |  | | --- | |  | | |  | | --- | | Genetic predisposition plays a role in the likelihood of developing liver cirrhosis. |  |  | | --- | |  | |
| TCH | |  | | --- | | Total Cholesterol |  |  | | --- | |  | | |  | | --- | | Yes |  |  | | --- | |  | | |  | | --- | | Cholesterol levels can be indicative of overall metabolic health. |  |  | | --- | |  | |
| TG | |  | | --- | | Triglycerides |  |  | | --- | |  | | |  | | --- | | Yes |  |  | | --- | |  | | |  | | --- | | Elevated triglycerides can indicate metabolic issues affecting liver health. |  |  | | --- | |  | |
| LDL | |  | | --- | | Low-density lipoprotein |  |  | | --- | |  | | No | |  | | --- | | Initial analysis showed no significant correlation with liver cirrhosis. |  |  | | --- | |  | |
| HDL | |  | | --- | | High-density lipoprotein |  |  | | --- | |  | | |  | | --- | | Yes |  |  | | --- | |  | | |  | | --- | | HDL levels are important indicators of cardiovascular and overall health. |  |  | | --- | |  | |
| |  | | --- | | Hemoglobin |  |  | | --- | |  | | |  | | --- | | Hemoglobin levels (g/dl) |  |  | | --- | |  | | |  | | --- | | Yes |  |  | | --- | |  | | |  | | --- | | Hemoglobin levels can reflect the oxygen-carrying capacity of the blood. |  |  | | --- | |  | |
| PCV | |  | | --- | | Packed cell volume (%) |  |  | | --- | |  | | |  | | --- | | Yes |  |  | | --- | |  | | |  | | --- | | PCV is an indicator of the proportion of blood volume occupied by red blood cells. |  |  | | --- | |  | |
| RBC | |  | | --- | | Red blood cell count (million cells/microliter) |  |  | | --- | |  | | |  | | --- | | Yes |  |  | | --- | |  | | |  | | --- | | RBC count is crucial for assessing the blood's capacity to carry oxygen. |  |  | | --- | |  | |
| MCV | |  | | --- | | Mean corpuscular hemoglobin (picograms/cell) |  |  | | --- | |  | | No | |  | | --- | | Initial analysis showed no significant correlation with liver cirrhosis. |  |  | | --- | |  | |
| |  | | --- | | MCH |  |  | | --- | |  | | |  | | --- | | Mean corpuscular hemoglobin (picograms/cell) |  |  | | --- | |  | | No | |  | | --- | | Initial analysis showed no significant correlation with liver cirrhosis. |  |  | | --- | |  | |
| MCHC | |  | | --- | | Mean corpuscular hemoglobin concentration (g/dl) |  |  | | --- | |  |  |  | | --- | |  | | No | |  |  |  | | --- | --- | --- | | |  | | --- | | Initial analysis showed no significant correlation with liver cirrhosis. |  |  | | --- | |  | |  |  | | --- | |  | |
| |  | | --- | | Total Count |  |  | | --- | |  | | |  |  |  | | --- | --- | --- | | |  | | --- | | Total white blood cell count |  |  | | --- | |  | |  |  | | --- | |  | | Yes | |  |  |  | | --- | --- | --- | | |  | | --- | | White blood cell count can indicate immune system activity and inflammation. |  |  | | --- | |  | |  |  | | --- | |  | |
| |  | | --- | | Polymorphs |  |  | | --- | |  | | |  |  |  | | --- | --- | --- | | |  | | --- | | Polymorph percentage (%) |  |  | | --- | |  | |  |  | | --- | |  | | |  | | --- | | No |  |  | | --- | |  | | |  |  |  | | --- | --- | --- | | |  | | --- | | Initial analysis showed no significant correlation with liver cirrhosis. |  |  | | --- | |  | |  |  | | --- | |  | |
| Lymphocytes | |  |  |  | | --- | --- | --- | | |  | | --- | | Lymphocyte percentage (%) |  |  | | --- | |  | |  |  | | --- | |  | | |  | | --- | | Yes |  |  | | --- | |  | | |  |  |  | | --- | --- | --- | | |  | | --- | | Lymphocyte levels can indicate immune system health and response. |  |  | | --- | |  | |  |  | | --- | |  | |
| Monocytes | |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | |  |  |  |  |  | | --- | --- | --- | --- | --- | | |  |  |  | | --- | --- | --- | | |  | | --- | | Monocyte percentage (%) |  |  | | --- | |  | |  |  | | --- | |  | |  |  | | --- | |  | |  |  | | --- | |  | | No | |  |  |  | | --- | --- | --- | | |  | | --- | | Initial analysis showed no significant correlation with liver cirrhosis. |  |  | | --- | |  | |  |  | | --- | |  | |
| Eosinophils | |  |  |  |  |  | | --- | --- | --- | --- | --- | | |  |  |  | | --- | --- | --- | | |  | | --- | | Eosinophil percentage (%) |  |  | | --- | |  | |  |  | | --- | |  | |  |  | | --- | |  | | No | |  | | --- | | Initial analysis showed no significant correlation with liver cirrhosis. |  |  | | --- | |  | |
| Basophils | |  |  |  | | --- | --- | --- | | |  | | --- | | Basophil percentage (%) |  |  | | --- | |  | |  |  | | --- | |  | | No | |  |  |  |  |  | | --- | --- | --- | --- | --- | | |  |  |  | | --- | --- | --- | | |  | | --- | | Initial analysis showed no significant correlation with liver cirrhosis. |  |  | | --- | |  | |  |  | | --- | |  | |  |  | | --- | |  | |
| |  | | --- | | Platelet Count |  |  | | --- | |  | | |  | | --- | | Platelet count (lakhs/mm) |  |  | | --- | |  | | |  | | --- | | Yes |  |  | | --- | |  | | |  |  |  | | --- | --- | --- | | |  | | --- | | Platelet levels can reflect blood clotting ability and liver function. |  |  | | --- | |  | |  |  | | --- | |  | |
| |  | | --- | | Total Bilirubin |  |  | | --- | |  | | |  |  |  | | --- | --- | --- | | |  | | --- | | Total bilirubin levels (mg/dl) |  |  | | --- | |  | |  |  | | --- | |  | | |  | | --- | | Yes |  |  | | --- | |  | | |  |  |  | | --- | --- | --- | | |  | | --- | | Bilirubin levels are directly related to liver function. |  |  | | --- | |  | |  |  | | --- | |  | |
| Direct | |  |  |  | | --- | --- | --- | | |  | | --- | | Direct bilirubin levels (mg/dl) |  |  | | --- | |  | |  |  | | --- | |  | | |  | | --- | | Yes |  |  | | --- | |  | | |  |  |  | | --- | --- | --- | | |  | | --- | | Direct bilirubin levels indicate liver's ability to conjugate and excrete bilirubin. |  |  | | --- | |  | |  |  | | --- | |  | |
| |  | | --- | | Indirect |  |  | | --- | |  | | |  |  |  | | --- | --- | --- | | |  | | --- | | Indirect bilirubin levels (mg/dl) |  |  | | --- | |  | |  |  | | --- | |  | | |  | | --- | | Yes |  |  | | --- | |  | | |  |  |  | | --- | --- | --- | | |  | | --- | | Indirect bilirubin levels indicate the amount of unconjugated bilirubin in the blood. |  |  | | --- | |  | |  |  | | --- | |  | |
| |  | | --- | | Total Protein |  |  | | --- | |  | | |  | | --- | | Total protein levels (g/dl) |  |  | | --- | |  | | |  | | --- | | Yes |  |  | | --- | |  | | |  |  |  |  |  | | --- | --- | --- | --- | --- | | |  |  |  | | --- | --- | --- | | |  | | --- | | Total protein levels can reflect overall liver function and nutritional status. |  |  | | --- | |  | |  |  | | --- | |  | |  |  | | --- | |  | |
| Albumin | |  | | --- | | Albumin levels (g/dl) |  |  | | --- | |  | | |  | | --- | | Yes |  |  | | --- | |  | | |  |  |  | | --- | --- | --- | | |  | | --- | | Albumin levels are indicative of liver's ability to synthesize proteins. |  |  | | --- | |  | |  |  | | --- | |  | |
| Globulin | |  | | --- | | Globulin levels (g/dl) |  |  | | --- | |  | | |  | | --- | | Yes |  |  | | --- | |  | | |  |  |  | | --- | --- | --- | | |  | | --- | | Globulin levels can reflect immune function and protein synthesis. |  |  | | --- | |  | |  |  | | --- | |  | |
| |  | | --- | | A/G Ratio |  |  | | --- | |  | | |  | | --- | | Albumin/Globulin ratio |  |  | | --- | |  | | |  | | --- | | Yes |  |  | | --- | |  | | |  |  | | --- | --- | | A/G ratio can provide insights into liver function and protein balance. | Globulin levels can reflect immune function and protein synthesis. |  |  | | --- | |  | |
| |  | | --- | | AL. Phosphatase |  |  | | --- | |  | | |  | | --- | | Alkaline phosphatase levels (U/L) |  |  | | --- | |  | | |  | | --- | | Yes |  |  | | --- | |  | | |  | | --- | |  | | |  | | --- | | Elevated levels can indicate liver damage or disease. |  |  | | --- | |  | | |  |  | | --- | |  | |
| |  | | --- | | SGOT |  |  | | --- | |  | | |  | | --- | | Serum glutamic oxaloacetic transaminase (AST) levels (U/L) |  |  | | --- | |  | | |  | | --- | | Yes |  |  | | --- | |  | | |  | | --- | | Elevated levels can indicate liver damage or disease. |  |  | | --- | |  | |
| SGPT | |  | | --- | | Serum glutamic pyruvic transaminase (ALT) levels (U/L) |  |  | | --- | |  | | |  | | --- | | Yes |  |  | | --- | |  | | |  | | --- | | Elevated levels can indicate liver damage or disease. |  |  | | --- | |  | |
| |  | | --- | | USG Abdomen |  |  | | --- | |  | | |  | | --- | | Ultrasound results for liver condition (diffuse or not) |  |  | | --- | |  | | |  | | --- | | Yes |  |  | | --- | |  | | Ultrasound results can provide visual confirmation of liver condition. |