**Lab Task-4 Artificial Intelligence**

For task 2, you are required to analytically build a decision tree from the data given below in the table. Note that the label (target variable) is the “Decision” column. The data is about whether to play tennis or not given the weather conditions. So when the tree is built, it should be able to give out a decision on whether to play tennis or not given the weather conditions.

The general process is as follows:

i. At the first split starting from the root, we choose the attribute that has the max gain.

ii. Then, we re-start the same process at each of the children nodes (if node not pure).

iii. If node is pure, i.e. the node contains only the examples from a single class, then we keep it as a terminal node

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Outlook | Temp | Humidity | Wind | Decision |
| Sunny | Hot | High | Weak | No |
| Sunny | Hot | High | Strong | No |
| Overcast | Hot | High | Weak | Yes |
| Rain | Mild | High | Weak | Yes |
| Rain | Cool | Normal | Weak | Yes |
| Rain | Cool | Normal | Strong | No |
| Overcast | Cool | Normal | Strong | Yes |
| Sunny | Mild | High | Weak | No |
| Sunny | Cool | Normal | Weak | Yes |
| Rain | Mild | Normal | Weak | Yes |
| Sunny | Mild | Normal | Strong | Yes |
| Overcast | Mild | High | Strong | Yes |
| Overcast | Hot | Normal | Weak | Yes |
| Rain | Mild | High | Strong | No |

The following are the images of the above question’s solution:









