**ML Assignment -3**

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Description automatically generated

**Q1.AB**

DEPTH = 1

ACCURACY | Train 84.00 | Test 58.57

DEPTH = 2

ACCURACY | Train 84.00 | Test 58.57

DEPTH = 3

ACCURACY | Train 84.00 | Test 58.57

DEPTH = 4

ACCURACY | Train 90.00 | Test 58.57

DEPTH = 5

ACCURACY | Train 98.00 | Test 60.00

The results indicateoverfitting for depth values of 4, 5.

Learned Decision Trees are:

Decision Tree of depth 1 is:

--- X 0 < 1.67

|--- value: class: M

--- X 0 >= 1.67

|--- value: class: W

Decision Tree of depth 2 is:

--- X 0 < 1.67

|--- X 1 < 84.12

| |--- value: class: M

|--- X 1 >= 84.12

| |--- value: class: M

--- X 0 >= 1.67

|--- X 0 < 1.57

| |--- value: class: W

|--- X 0 >= 1.57

| |--- value: class: W

Decision Tree of depth 3 is:

--- X 0 < 1.67

|--- X 1 < 84.12

| |--- value: class: M

|--- X 1 >= 84.12

| |--- X 1 < 76.29

| | |--- value: class: M

| |--- X 1 >= 76.29

| | |--- value: class: M

--- X 0 >= 1.67

|--- X 0 < 1.57

| |--- X 0 < 1.62

| | |--- value: class: W

| |--- X 0 >= 1.62

| | |--- value: class: W

|--- X 0 >= 1.57

| |--- value: class: W

Decision Tree of depth 4 is:

--- X 0 < 1.67

|--- X 1 < 84.12

| |--- value: class: M

|--- X 1 >= 84.12

| |--- X 1 < 76.29

| | |--- X 1 < 78.24

| | | |--- value: class: M

| | |--- X 1 >= 78.24

| | | |--- value: class: W

| |--- X 1 >= 76.29

| | |--- value: class: M

--- X 0 >= 1.67

|--- X 0 < 1.57

| |--- X 0 < 1.62

| | |--- value: class: W

| |--- X 0 >= 1.62

| | |--- X 0 < 1.60

| | | |--- value: class: M

| | |--- X 0 >= 1.60

| | | |--- value: class: W

|--- X 0 >= 1.57

| |--- value: class: W

Decision Tree of depth 5 is:

--- X 0 < 1.67

|--- X 1 < 84.12

| |--- value: class: M

|--- X 1 >= 84.12

| |--- X 1 < 76.29

| | |--- X 1 < 78.24

| | | |--- X 1 < 83.75

| | | | |--- value: class: W

| | | |--- X 1 >= 83.75

| | | | |--- value: class: M

| | |--- X 1 >= 78.24

| | | |--- X 1 < 77.58

| | | | |--- value: class: W

| | | |--- X 1 >= 77.58

| | | | |--- value: class: M

| |--- X 1 >= 76.29

| | |--- value: class: M

--- X 0 >= 1.67

|--- X 0 < 1.57

| |--- X 0 < 1.62

| | |--- value: class: W

| |--- X 0 >= 1.62

| | |--- X 0 < 1.60

| | | |--- value: class: M

| | |--- X 0 >= 1.60

| | | |--- X 0 < 1.58

| | | | |--- value: class: W

| | | |--- X 0 >= 1.58

| | | | |--- value: class: M

|--- X 0 >= 1.57

| |--- value: class: W