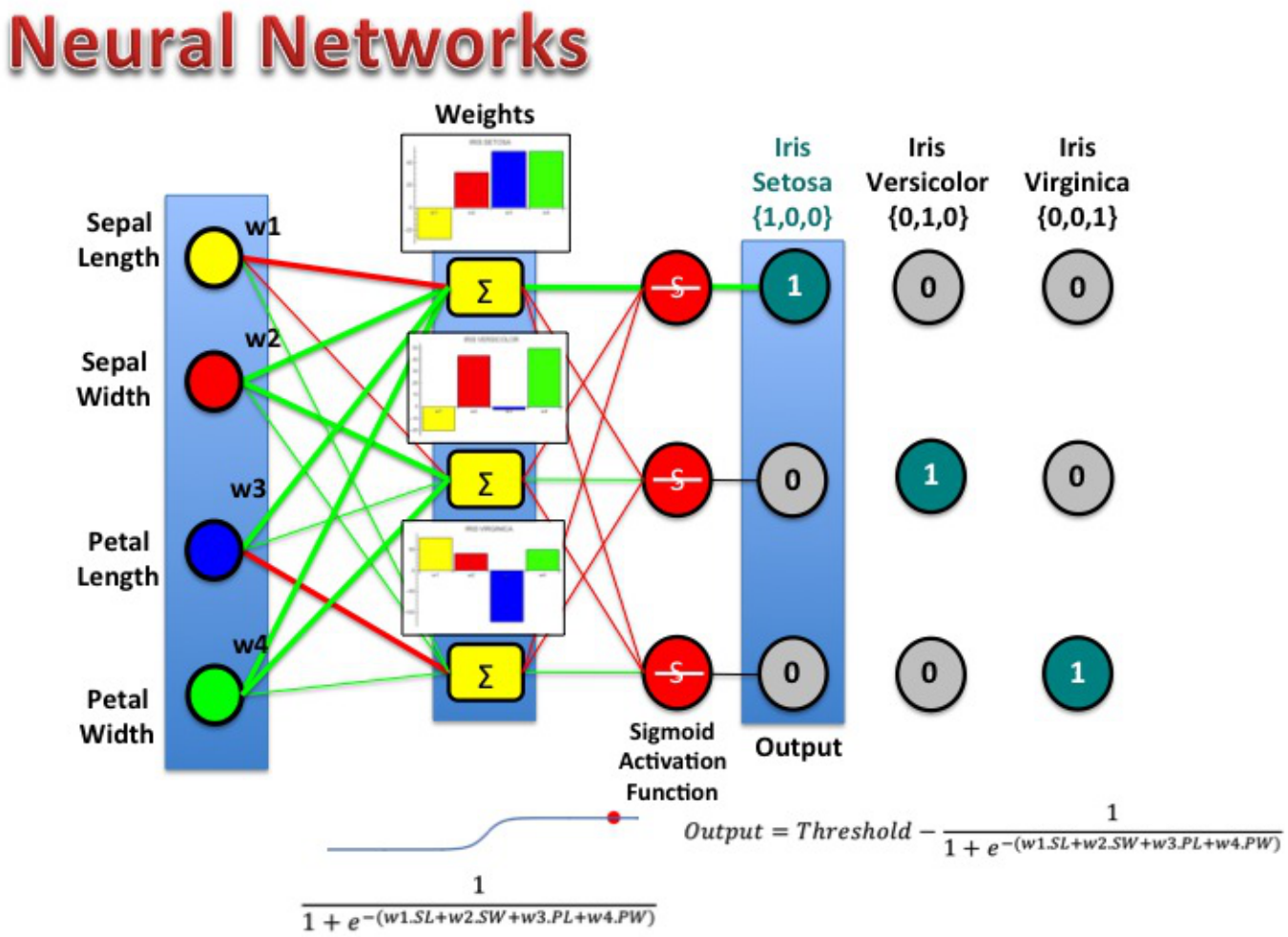
In[1]:=
```
Clear["Global`*"]
```



In[2]:=
```
a = {5.1, 3.5, 1.4, 0.2, "Iris-setosa",
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4.7, 3.2, 1.3, 0.2, "Iris-setosa",
4.6, 3.1, 1.5, 0.2, "Iris-setosa",
5.0, 3.6, 1.4, 0.2, "Iris-setosa",
5.4, 3.9, 1.7, 0.4, "Iris-setosa",
4.6, 3.4, 1.4, 0.3, "Iris-setosa",
5.0, 3.4, 1.5, 0.2, "Iris-setosa",
4.4, 2.9, 1.4, 0.2, "Iris-setosa",
4.9, 3.1, 1.5, 0.1, "Iris-setosa",
5.4, 3.7, 1.5, 0.2, "Iris-setosa",
4.8, 3.4, 1.6, 0.2, "Iris-setosa",
4.8, 3.0, 1.4, 0.1, "Iris-setosa",
4.3, 3.0, 1.1, 0.1, "Iris-setosa",
5.8, 4.0, 1.2, 0.2, "Iris-setosa",
5.7, 4.4, 1.5, 0.4, "Iris-setosa",
5.4, 3.9, 1.3, 0.4, "Iris-setosa",
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5.7, 3.8, 1.7, 0.3, "Iris-setosa",
5.1, 3.8, 1.5, 0.3, "Iris-setosa",
5.4, 3.4, 1.7, 0.2, "Iris-setosa",
5.1, 3.7, 1.5, 0.4, "Iris-setosa",
4.6, 3.6, 1.0, 0.2, "Iris-setosa",
5.1, 3.3, 1.7, 0.5, "Iris-setosa",
4.8, 3.4, 1.9, 0.2, "Iris-setosa",
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5.0, 3.4, 1.6, 0.4, "Iris-setosa",
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5.2, 3.4, 1.4, 0.2, "Iris-setosa",
4.7, 3.2, 1.6, 0.2, "Iris-setosa",
4.8, 3.1, 1.6, 0.2, "Iris-setosa",
5.4, 3.4, 1.5, 0.4, "Iris-setosa",
5.2, 4.1, 1.5, 0.1, "Iris-setosa",
5.5, 4.2, 1.4, 0.2, "Iris-setosa",
4.9, 3.1, 1.5, 0.1, "Iris-setosa",
5.0, 3.2, 1.2, 0.2, "Iris-setosa",
5.5, 3.5, 1.3, 0.2, "Iris-setosa",
4.9, 3.1, 1.5, 0.1, "Iris-setosa",
4.4, 3.0, 1.3, 0.2, "Iris-setosa",
5.1, 3.4, 1.5, 0.2, "Iris-setosa",
5.0, 3.5, 1.3, 0.3, "Iris-setosa",
4.5, 2.3, 1.3, 0.3, "Iris-setosa",
4.4, 3.2, 1.3, 0.2, "Iris-setosa",
5.0, 3.5, 1.6, 0.6, "Iris-setosa",
5.1, 3.8, 1.9, 0.4, "Iris-setosa",
4.8, 3.0, 1.4, 0.3, "Iris-setosa",
5.1, 3.8, 1.6, 0.2, "Iris-setosa",
4.6, 3.2, 1.4, 0.2, "Iris-setosa",
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5.0, 3.3, 1.4, 0.2, "Iris-setosa",
7.0, 3.2, 4.7, 1.4, "Iris-versicolor",
6.4, 3.2, 4.5, 1.5, "Iris-versicolor",
6.9, 3.1, 4.9, 1.5, "Iris-versicolor",
```

```
5.5, 2.3, 4.0, 1.3, "Iris-versicolor",
6.5, 2.8, 4.6, 1.5, "Iris-versicolor",
5.7, 2.8, 4.5, 1.3, "Iris-versicolor",
6.3, 3.3, 4.7, 1.6, "Iris-versicolor",
4.9, 2.4, 3.3, 1.0, "Iris-versicolor",
6.6, 2.9, 4.6, 1.3, "Iris-versicolor",
5.2, 2.7, 3.9, 1.4, "Iris-versicolor",
5.0, 2.0, 3.5, 1.0, "Iris-versicolor",
5.9, 3.0, 4.2, 1.5, "Iris-versicolor",
6.0, 2.2, 4.0, 1.0, "Iris-versicolor",
6.1, 2.9, 4.7, 1.4, "Iris-versicolor",
5.6, 2.9, 3.6, 1.3, "Iris-versicolor",
6.7, 3.1, 4.4, 1.4, "Iris-versicolor",
5.6, 3.0, 4.5, 1.5, "Iris-versicolor",
5.8, 2.7, 4.1, 1.0, "Iris-versicolor",
6.2, 2.2, 4.5, 1.5, "Iris-versicolor",
5.6, 2.5, 3.9, 1.1, "Iris-versicolor",
5.9, 3.2, 4.8, 1.8, "Iris-versicolor",
6.1, 2.8, 4.0, 1.3, "Iris-versicolor",
6.3, 2.5, 4.9, 1.5, "Iris-versicolor",
6.1, 2.8, 4.7, 1.2, "Iris-versicolor",
6.4, 2.9, 4.3, 1.3, "Iris-versicolor",
6.6, 3.0, 4.4, 1.4, "Iris-versicolor",
6.8, 2.8, 4.8, 1.4, "Iris-versicolor",
6.7, 3.0, 5.0, 1.7, "Iris-versicolor",
6.0, 2.9, 4.5, 1.5, "Iris-versicolor",
5.7, 2.6, 3.5, 1.0, "Iris-versicolor",
5.5, 2.4, 3.8, 1.1, "Iris-versicolor",
5.5, 2.4, 3.7, 1.0, "Iris-versicolor",
5.8, 2.7, 3.9, 1.2, "Iris-versicolor",
6.0, 2.7, 5.1, 1.6, "Iris-versicolor",
5.4, 3.0, 4.5, 1.5, "Iris-versicolor",
6.0, 3.4, 4.5, 1.6, "Iris-versicolor",
6.7, 3.1, 4.7, 1.5, "Iris-versicolor",
6.3, 2.3, 4.4, 1.3, "Iris-versicolor",
5.6, 3.0, 4.1, 1.3, "Iris-versicolor",
5.5, 2.5, 4.0, 1.3, "Iris-versicolor",
5.5, 2.6, 4.4, 1.2, "Iris-versicolor",
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5.8, 2.6, 4.0, 1.2, "Iris-versicolor",
5.0, 2.3, 3.3, 1.0, "Iris-versicolor",
5.6, 2.7, 4.2, 1.3, "Iris-versicolor",
5.7, 3.0, 4.2, 1.2, "Iris-versicolor",
5.7, 2.9, 4.2, 1.3, "Iris-versicolor",
6.2, 2.9, 4.3, 1.3, "Iris-versicolor",
5.1, 2.5, 3.0, 1.1, "Iris-versicolor",
5.7, 2.8, 4.1, 1.3, "Iris-versicolor",
6.3, 3.3, 6.0, 2.5, "Iris-virginica",
5.8, 2.7, 5.1, 1.9, "Iris-virginica",
7.1, 3.0, 5.9, 2.1, "Iris-virginica",
6.3, 2.9, 5.6, 1.8, "Iris-virginica",
6.5, 3.0, 5.8, 2.2, "Iris-virginica",
7.6, 3.0, 6.6, 2.1, "Iris-virginica",
4.9, 2.5, 4.5, 1.7, "Iris-virginica",
7.3, 2.9, 6.3, 1.8, "Iris-virginica",
6.7, 2.5, 5.8, 1.8, "Iris-virginica",
7.2, 3.6, 6.1, 2.5, "Iris-virginica",
6.5, 3.2, 5.1, 2.0, "Iris-virginica",
6.4, 2.7, 5.3, 1.9, "Iris-virginica",
6.8, 3.0, 5.5, 2.1, "Iris-virginica",
5.7, 2.5, 5.0, 2.0, "Iris-virginica",
5.8, 2.8, 5.1, 2.4, "Iris-virginica",
6.4, 3.2, 5.3, 2.3, "Iris-virginica",
6.5, 3.0, 5.5, 1.8, "Iris-virginica",
7.7, 3.8, 6.7, 2.2, "Iris-virginica",
7.7, 2.6, 6.9, 2.3, "Iris-virginica",
6.0, 2.2, 5.0, 1.5, "Iris-virginica",
6.9, 3.2, 5.7, 2.3, "Iris-virginica",
5.6, 2.8, 4.9, 2.0, "Iris-virginica",
7.7, 2.8, 6.7, 2.0, "Iris-virginica",
6.3, 2.7, 4.9, 1.8, "Iris-virginica",
6.7, 3.3, 5.7, 2.1, "Iris-virginica",
7.2, 3.2, 6.0, 1.8, "Iris-virginica",
6.2, 2.8, 4.8, 1.8, "Iris-virginica",
6.1, 3.0, 4.9, 1.8, "Iris-virginica",
6.4, 2.8, 5.6, 2.1, "Iris-virginica",
7.2, 3.0, 5.8, 1.6, "Iris-virginica",
7.4, 2.8, 6.1, 1.9, "Iris-virginica",
7.9, 3.8, 6.4, 2.0, "Iris-virginica",
6.4, 2.8, 5.6, 2.2, "Iris-virginica",
6.3, 2.8, 5.1, 1.5, "Iris-virginica",
6.1, 2.6, 5.6, 1.4, "Iris-virginica",
7.7, 3.0, 6.1, 2.3, "Iris-virginica",
6.3, 3.4, 5.6, 2.4, "Iris-virginica",
6.4, 3.1, 5.5, 1.8, "Iris-virginica",
6.0, 3.0, 4.8, 1.8, "Iris-virginica",
6.9, 3.1, 5.4, 2.1, "Iris-virginica",
6.7, 3.1, 5.6, 2.4, "Iris-virginica",
6.9, 3.1, 5.1, 2.3, "Iris-virginica",
```

```
5.8, 2.7, 5.1, 1.9, "Iris-virginica",
6.8, 3.2, 5.9, 2.3, "Iris-virginica",
6.7, 3.3, 5.7, 2.5, "Iris-virginica",
6.7, 3.0, 5.2, 2.3, "Iris-virginica",
6.3, 2.5, 5.0, 1.9, "Iris-virginica",
6.5, 3.0, 5.2, 2.0, "Iris-virginica",
6.2, 3.4, 5.4, 2.3, "Iris-virginica",
5.9, 3.0, 5.1, 1.8, "Iris-virginica"};
```

In[3]:=
```
a02 = Partition[a, 5]; Dimensions[a02]
```

Out[3]=
```
{150, 5}
```

In[4]:=
PREPARING DATA;

In[5]:=
```
a2 = Partition[Drop[a02[[#]], -1] & /@ Table[k, {k, 1, Dimensions[a02][[1]], 1}], 50]
```

Out[5]=
```
{{{5.1, 3.5, 1.4, 0.2}, {4.9, 3., 1.4, 0.2}, {4.7, 3.2, 1.3, 0.2}, {4.6, 3.1, 1.5, 0.2}, {5., 3.6, 1.4, 0.2}, {5.4, 3.9, 1.7, 0.4},
   {4.6, 3.4, 1.4, 0.3}, {5., 3.4, 1.5, 0.2}, {4.4, 2.9, 1.4, 0.2}, {4.9, 3.1, 1.5, 0.1}, {5.4, 3.7, 1.5, 0.2},
   {4.8, 3.4, 1.6, 0.2}, {4.8, 3., 1.4, 0.1}, {4.3, 3., 1.1, 0.1}, {5.8, 4., 1.2, 0.2}, {5.7, 4.4, 1.5, 0.4}, {5.4, 3.9, 1.3, 0.4},
   {5.1, 3.5, 1.4, 0.3}, {5.7, 3.8, 1.7, 0.3}, {5.1, 3.8, 1.5, 0.3}, {5.4, 3.4, 1.7, 0.2}, {5.1, 3.7, 1.5, 0.4},
   {4.6, 3.6, 1., 0.2}, {5.1, 3.3, 1.7, 0.5}, {4.8, 3.4, 1.9, 0.2}, {5., 3., 1.6, 0.2}, {5., 3.4, 1.6, 0.4}, {5.2, 3.5, 1.5, 0.2},
   {5.2, 3.4, 1.4, 0.2}, {4.7, 3.2, 1.6, 0.2}, {4.8, 3.1, 1.6, 0.2}, {5.4, 3.4, 1.5, 0.4}, {5.2, 4.1, 1.5, 0.1},
   {5.5, 4.2, 1.4, 0.2}, {4.9, 3.1, 1.5, 0.1}, {5., 3.2, 1.2, 0.2}, {5.5, 3.5, 1.3, 0.2}, {4.9, 3.1, 1.5, 0.1}, {4.4, 3., 1.3, 0.2},
   {5.1, 3.4, 1.5, 0.2}, {5., 3.5, 1.3, 0.3}, {4.5, 2.3, 1.3, 0.3}, {4.4, 3.2, 1.3, 0.2}, {5., 3.5, 1.6, 0.6}, {5.1, 3.8, 1.9, 0.4},
   {4.8, 3., 1.4, 0.3}, {5.1, 3.8, 1.6, 0.2}, {4.6, 3.2, 1.4, 0.2}, {5.3, 3.7, 1.5, 0.2}, {5., 3.3, 1.4, 0.2}},
  {{7., 3.2, 4.7, 1.4}, {6.4, 3.2, 4.5, 1.5}, {6.9, 3.1, 4.9, 1.5}, {5.5, 2.3, 4., 1.3}, {6.5, 2.8, 4.6, 1.5},
   {5.7, 2.8, 4.5, 1.3}, {6.3, 3.3, 4.7, 1.6}, {4.9, 2.4, 3.3, 1.}, {6.6, 2.9, 4.6, 1.3}, {5.2, 2.7, 3.9, 1.4},
   {5., 2., 3.5, 1.}, {5.9, 3., 4.2, 1.5}, {6., 2.2, 4., 1.}, {6.1, 2.9, 4.7, 1.4}, {5.6, 2.9, 3.6, 1.3}, {6.7, 3.1, 4.4, 1.4},
   {5.6, 3., 4.5, 1.5}, {5.8, 2.7, 4.1, 1.}, {6.2, 2.2, 4.5, 1.5}, {5.6, 2.5, 3.9, 1.1}, {5.9, 3.2, 4.8, 1.8}, {6.1, 2.8, 4., 1.3},
   {6.3, 2.5, 4.9, 1.5}, {6.1, 2.8, 4.7, 1.2}, {6.4, 2.9, 4.3, 1.3}, {6.6, 3., 4.4, 1.4}, {6.8, 2.8, 4.8, 1.4},
   {6.7, 3., 5., 1.7}, {6., 2.9, 4.5, 1.5}, {5.7, 2.6, 3.5, 1.}, {5.5, 2.4, 3.8, 1.1}, {5.5, 2.4, 3.7, 1.}, {5.8, 2.7, 3.9, 1.2},
   {6., 2.7, 5.1, 1.6}, {5.4, 3., 4.5, 1.5}, {6., 3.4, 4.5, 1.6}, {6.7, 3.1, 4.7, 1.5}, {6.3, 2.3, 4.4, 1.3}, {5.6, 3., 4.1, 1.3},
   {5.5, 2.5, 4., 1.3}, {5.5, 2.6, 4.4, 1.2}, {6.1, 3., 4.6, 1.4}, {5.8, 2.6, 4., 1.2}, {5., 2.3, 3.3, 1.}, {5.6, 2.7, 4.2, 1.3},
   {5.7, 3., 4.2, 1.2}, {5.7, 2.9, 4.2, 1.3}, {6.2, 2.9, 4.3, 1.3}, {5.1, 2.5, 3., 1.1}, {5.7, 2.8, 4.1, 1.3}},
  {{6.3, 3.3, 6., 2.5}, {5.8, 2.7, 5.1, 1.9}, {7.1, 3., 5.9, 2.1}, {6.3, 2.9, 5.6, 1.8}, {6.5, 3., 5.8, 2.2},
   {7.6, 3., 6.6, 2.1}, {4.9, 2.5, 4.5, 1.7}, {7.3, 2.9, 6.3, 1.8}, {6.7, 2.5, 5.8, 1.8}, {7.2, 3.6, 6.1, 2.5},
   {6.5, 3.2, 5.1, 2.}, {6.4, 2.7, 5.3, 1.9}, {6.8, 3., 5.5, 2.1}, {5.7, 2.5, 5., 2.}, {5.8, 2.8, 5.1, 2.4}, {6.4, 3.2, 5.3, 2.3},
   {6.5, 3., 5.5, 1.8}, {7.7, 3.8, 6.7, 2.2}, {7.7, 2.6, 6.9, 2.3}, {6., 2.2, 5., 1.5}, {6.9, 3.2, 5.7, 2.3}, {5.6, 2.8, 4.9, 2.},
   {7.7, 2.8, 6.7, 2.}, {6.3, 2.7, 4.9, 1.8}, {6.7, 3.3, 5.7, 2.1}, {7.2, 3.2, 6., 1.8}, {6.2, 2.8, 4.8, 1.8}, {6.1, 3., 4.9, 1.8},
   {6.4, 2.8, 5.6, 2.1}, {7.2, 3., 5.8, 1.6}, {7.4, 2.8, 6.1, 1.9}, {7.9, 3.8, 6.4, 2.}, {6.4, 2.8, 5.6, 2.2},
   {6.3, 2.8, 5.1, 1.5}, {6.1, 2.6, 5.6, 1.4}, {7.7, 3., 6.1, 2.3}, {6.3, 3.4, 5.6, 2.4}, {6.4, 3.1, 5.5, 1.8}, {6., 3., 4.8, 1.8},
   {6.9, 3.1, 5.4, 2.1}, {6.7, 3.1, 5.6, 2.4}, {6.9, 3.1, 5.1, 2.3}, {5.8, 2.7, 5.1, 1.9}, {6.8, 3.2, 5.9, 2.3},
   {6.7, 3.3, 5.7, 2.5}, {6.7, 3., 5.2, 2.3}, {6.3, 2.5, 5., 1.9}, {6.5, 3., 5.2, 2.}, {6.2, 3.4, 5.4, 2.3}, {5.9, 3., 5.1, 1.8}}}
```

In[15]:=
```
t = 1;
```

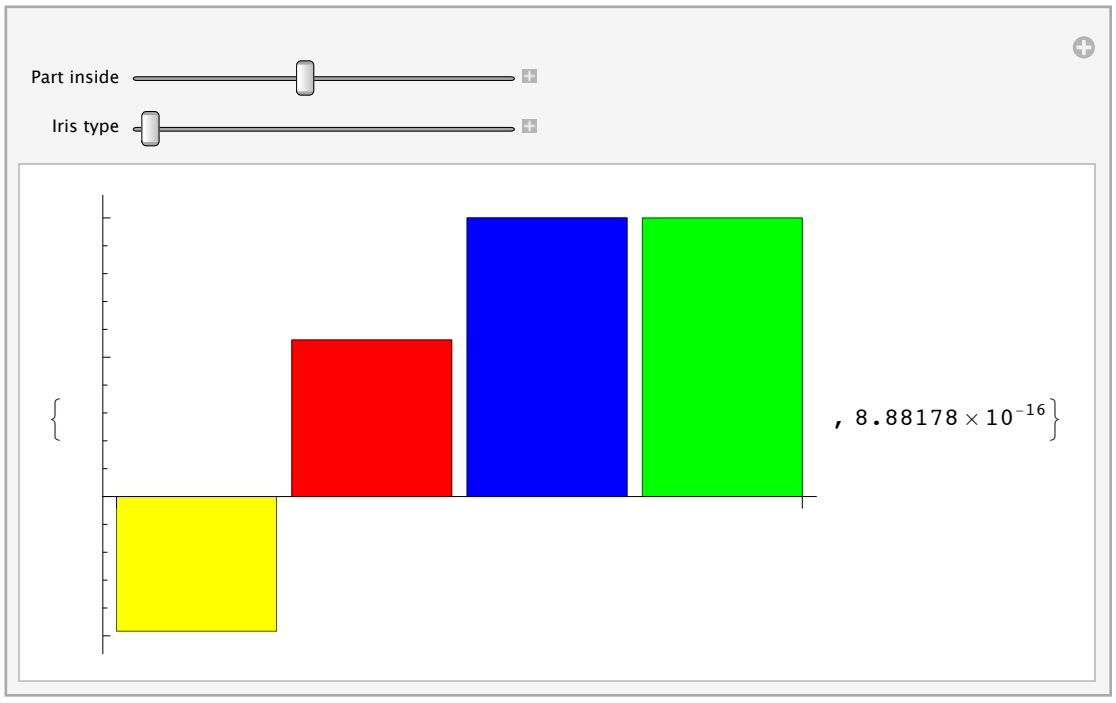
In[16]:=
NO HIDDEN LAYER;

In[17]:=
```
1 / (1 + 2.71^-t)
```

Out[17]=
```
0.730458
```

In[18]:=
```
Manipulate[

  o4 = a2[[aa]][[nv]][[4]]; error4 = o4 (1 - o4) (t - o4); w004 = 1 + - .005 error4 a2[[aa]][[nv]][[4]];

  o3 = a2[[aa]][[nv]][[3]]; error3 = o3 (1 - o3) (t - o3); w003 = 1 + - .005 error3 a2[[aa]][[nv]][[3]];

  o2 = a2[[aa]][[nv]][[2]]; error2 = o2 (1 - o2) (t - o2); w002 = 1 + - .005 error2 a2[[aa]][[nv]][[2]];

  o1 = a2[[aa]][[nv]][[1]];
  error1 = o1 (1 - o1) (t - o1);
  w001 = 1 + (t - (a2[[aa]][[nv]][[1]] + w002 a2[[aa]][[nv]][[2]] + w003 a2[[aa]][[nv]][[3]] + w004 a2[[aa]][[nv]][[4]])) /
     a2[[aa]][[nv]][[1]];
  diff = t - (w001 a2[[aa]][[nv]][[1]] + w002 a2[[aa]][[nv]][[2]] + w003 a2[[aa]][[nv]][[3]] + w004 a2[[aa]][[nv]][[4]]);
  {BarChart[{w001, w002, w003, w004}, ImageSize → 400, ChartStyle → {Yellow, Red, Blue, Green}], diff},
  {{nv, 1, "Part inside"}, 1, 50, 1}, {{aa, 1, "Iris type"}, 1, 3, 1}]
```

Out[18]=



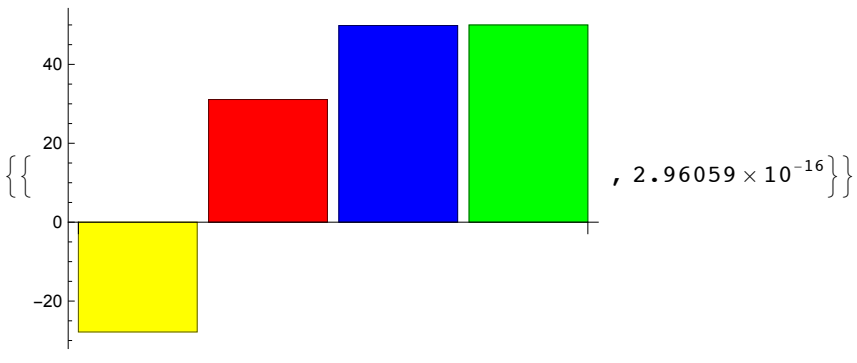
BACKPROPAGATION IRIS SETOSA;

In[20]:=
```
abg = {}; Do[AppendTo[abg,

  o4 = a2[[1]][[nv]][[4]]; error4 = o4 (1 - o4) (t - o4); w004 = 1 + - .005 error4 a2[[1]][[nv]][[4]];

  o3 = a2[[1]][[nv]][[3]]; error3 = o3 (1 - o3) (t - o3); w003 = 1 + - .005 error3 a2[[1]][[nv]][[3]];

  o2 = a2[[1]][[nv]][[2]]; error2 = o2 (1 - o2) (t - o2); w002 = 1 + - .005 error2 a2[[1]][[nv]][[2]];

  o1 = a2[[1]][[nv]][[1]];
  error1 = o1 (1 - o1) (t - o1);
  w001 = 1 +
    (t - (a2[[1]][[nv]][[1]] + w002 a2[[1]][[nv]][[2]] + w003 a2[[1]][[nv]][[3]] + w004 a2[[1]][[nv]][[4]])) / a2[[1]][[nv]][[1]];
  diff = t - (w001 a2[[1]][[nv]][[1]] + w002 a2[[1]][[nv]][[2]] + w003 a2[[1]][[nv]][[3]] + w004 a2[[1]][[nv]][[4]]);
  {w001, w002, w003, w004}], {nv, Table[k, {k, 1, 50, 1}]}]; abg
```

Out[20]=
```
{{-0.540772, 0.617188, 0.998432, 0.999872}, {-0.624037, 0.82, 0.998432, 0.999872}, {-0.618298, 0.752192, 0.99924, 0.999872},
 {-0.682362, 0.7881, 0.997188, 0.999872}, {-0.524161, 0.561952, 0.998432, 0.999872}, {-0.461756, 0.36042, 0.99292, 0.999712},
 {-0.644736, 0.667072, 0.998432, 0.99978}, {-0.59276, 0.667072, 0.997188, 0.999872}, {-0.694899, 0.8482, 0.998432, 0.999872},
 {-0.620181, 0.7881, 0.997188, 0.99996}, {-0.472121, 0.500999, 0.997188, 0.999872}, {-0.637635, 0.667072, 0.995392, 0.999872},
 {-0.616208, 0.82, 0.998432, 0.99996}, {-0.618588, 0.82, 0.99994, 0.99996}, {-0.262005, 0.28, 0.999712, 0.999872},
 {-0.0652686, -0.119008, 0.997188, 0.999712}, {-0.389728, 0.36042, 0.99924, 0.999712},
 {-0.560372, 0.617188, 0.998432, 0.99978}, {-0.462617, 0.433952, 0.99292, 0.99978}, {-0.479359, 0.433952, 0.997188, 0.99978},
 {-0.584441, 0.667072, 0.99292, 0.999872}, {-0.539091, 0.500999, 0.997188, 0.999712}, {-0.483261, 0.561952, 1., 0.999872},
 {-0.693583, 0.71196, 0.99292, 0.999688}, {-0.695883, 0.667072, 0.98538, 0.999872}, {-0.65052, 0.82, 0.995392, 0.999872},
 {-0.652111, 0.667072, 0.995392, 0.999712}, {-0.549214, 0.617188, 0.997188, 0.999872},
 {-0.55112, 0.667072, 0.998432, 0.999872}, {-0.680769, 0.752192, 0.995392, 0.999872}, {-0.674106, 0.7881, 0.995392, 0.999872},
 {-0.585872, 0.667072, 0.997188, 0.999712}, {-0.266178, 0.19228, 0.997188, 0.99996}, {-0.182632, 0.096832, 0.998432, 0.999872},
 {-0.620181, 0.7881, 0.997188, 0.99996}, {-0.561329, 0.752192, 0.999712, 0.999872}, {-0.48348, 0.617188, 0.99924, 0.999872},
 {-0.620181, 0.7881, 0.997188, 0.99996}, {-0.672497, 0.82, 0.99924, 0.999872}, {-0.581137, 0.667072, 0.997188, 0.999872},
 {-0.55182, 0.617188, 0.99924, 0.99978}, {-0.621363, 0.9553, 0.99924, 0.99978}, {-0.660455, 0.752192, 0.99924, 0.999872},
 {-0.670522, 0.617188, 0.995392, 0.999712}, {-0.572769, 0.433952, 0.98538, 0.999712}, {-0.657862, 0.82, 0.998432, 0.99978},
 {-0.478749, 0.433952, 0.995392, 0.999872}, {-0.653216, 0.752192, 0.998432, 0.999872},
 {-0.481029, 0.500999, 0.997188, 0.999872}, {-0.589449, 0.71196, 0.998432, 0.999872}}
```

In[55]:=
```
{{BarChart[Total[abg], ImageSize → 300, ChartStyle → {Yellow, Red, Blue, Green}], diff / 3}}
```

Out[55]=



BACKPROPAGATION IRIS VERSICOLOR;

In[23]:=
```
abg2 = {}; t2 = 1; Do[AppendTo[abg2,

  o42 = a2[[2]][[nv2]][[4]]; error42 = o42 (1 - o42) (t2 - o42); w0042 = 1 + - .005 error42 a2[[2]][[nv2]][[4]];

  o32 = a2[[2]][[nv2]][[3]]; error32 = o32 (1 - o32) (t2 - o32); w0032 = 1 + - .005 error32 a2[[2]][[nv2]][[3]];

  o22 = a2[[2]][[nv2]][[2]]; error22 = o22 (1 - o22) (t2 - o22); w0022 = 1 + - .005 error22 a2[[2]][[nv2]][[2]];

  o12 = a2[[2]][[nv2]][[1]];
  error12 = o12 (1 - o12) (t2 - o12);
  w0012 = 1 + (t2 - (a2[[2]][[nv2]][[1]] + w0022 a2[[2]][[nv2]][[2]] + w0032 a2[[2]][[nv2]][[3]] + w0042 a2[[2]][[nv2]][[4]])) /
     a2[[2]][[nv2]][[1]];
  diff2 = t2 - (w0012 a2[[2]][[nv2]][[1]] + w0022 a2[[2]][[nv2]][[2]] + w0032 a2[[2]][[nv2]][[3]] + w0042 a2[[2]][[nv2]][[4]]);
  {w0012, w0022, w0032, w0042}], {nv2, Table[k, {k, 1, 50, 1}]}]; abg2
```

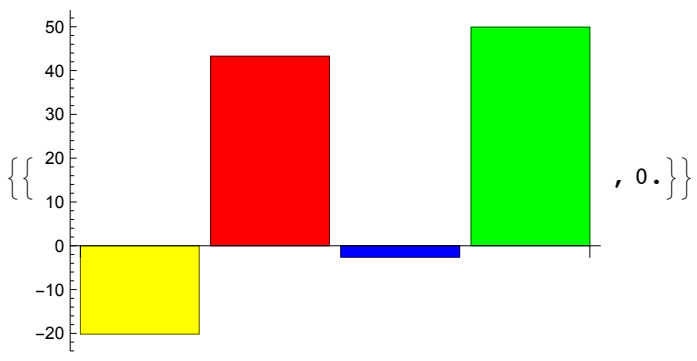
Out[23]=
```
{{-0.0568764, 0.752192, -0.512061, 0.998432}, {-0.284592, 0.752192, -0.240312, 0.997188},
 {0.160626, 0.7881, -0.825961, 0.997188}, {-0.657491, 0.9553, 0.28, 0.99924}, {-0.189659, 0.872992, -0.371168, 0.997188},
 {-0.291576, 0.872992, -0.240312, 0.99924}, {-0.0849856, 0.71196, -0.512061, 0.995392}, {-0.941631, 0.943552, 0.71196, 1.},
 {-0.159306, 0.8482, -0.371168, 0.99924}, {-0.81135, 0.894659, 0.36042, 0.998432}, {-0.824031, 0.98, 0.617188, 1.},
 {-0.569911, 0.82, 0.096832, 0.997188}, {-0.540556, 0.965152, 0.28, 1.}, {-0.0739179, 0.8482, -0.512061, 0.998432},
 {-0.853896, 0.8482, 0.561952, 0.99924}, {-0.345862, 0.7881, -0.119008, 0.998432}, {-0.33471, 0.82, -0.240312, 0.997188},
 {-0.552401, 0.894659, 0.19228, 1.}, {-0.248018, 0.965152, -0.240312, 0.997188}, {-0.683891, 0.929688, 0.36042, 0.99994},
 {-0.000611797, 0.752192, -0.663488, 0.989632}, {-0.633342, 0.872992, 0.28, 0.99924},
 {0.194795, 0.929688, -0.825961, 0.997188}, {-0.0389095, 0.872992, -0.512061, 0.999712},
 {-0.426505, 0.8482, -0.0067805, 0.99924}, {-0.353662, 0.82, -0.119008, 0.998432}, {0.0503765, 0.872992, -0.663488, 0.998432},
 {0.276423, 0.82, -1., 0.99292}, {-0.312359, 0.8482, -0.240312, 0.997188}, {-0.795646, 0.913472, 0.617188, 1.},
 {-0.729723, 0.943552, 0.433952, 0.99994}, {-0.748768, 0.943552, 0.500999, 1.}, {-0.693254, 0.894659, 0.36042, 0.999712},
 {0.506851, 0.894659, -1.18614, 0.995392}, {-0.347106, 0.82, -0.240312, 0.997188}, {-0.296544, 0.667072, -0.240312, 0.995392},
 {-0.0794336, 0.7881, -0.512061, 0.997188}, {-0.313106, 0.9553, -0.119008, 0.99924},
 {-0.633457, 0.82, 0.19228, 0.99924}, {-0.680587, 0.929688, 0.28, 0.99924}, {-0.372918, 0.913472, -0.119008, 0.999712},
 {-0.188595, 0.82, -0.371168, 0.998432}, {-0.637014, 0.913472, 0.28, 0.999712}, {-0.909331, 0.9553, 0.71196, 1.},
 {-0.557373, 0.894659, 0.096832, 0.99924}, {-0.537956, 0.82, 0.096832, 0.999712}, {-0.555348, 0.8482, 0.096832, 0.99924},
 {-0.440264, 0.8482, -0.0067805, 0.99924}, {-0.957677, 0.929688, 0.82, 0.99994}, {-0.619603, 0.872992, 0.19228, 0.99924}}
```

In[24]:=
```
Total[abg2[[1]] a2[[2]][[1]]]
```

Out[24]=
```
1.
```

In[54]:=
```
{{BarChart[Total[abg2], ImageSize → 300, ChartStyle → {Yellow, Red, Blue, Green}], diff2 / 3}}
```

Out[54]=




```
, 0.}}
```

BACKPROPAGATION IRIS VIRGINICA;

In[27]:=
```
abg23 = {}; t23 = 1; Do[AppendTo[abg23,

  o423 = a2[[3]][[nv3]][[4]];
  error423 = o423 (1 - o423) (t23 - o423);
  w00423 = 1 + - .005 error423 a2[[3]][[nv3]][[4]];

  o323 = a2[[3]][[nv3]][[3]];
  error323 = o323 (1 - o323) (t23 - o323);
  w00323 = 1 + - .005 error323 a2[[3]][[nv3]][[3]];

  o223 = a2[[3]][[nv3]][[2]];
  error223 = o223 (1 - o223) (t23 - o223);
  w00223 = 1 + - .005 error223 a2[[3]][[nv3]][[2]];

  o123 = a2[[3]][[nv3]][[1]];
  error123 = o123 (1 - o123) (t23 - o123);
  w00123 = 1 + (t23 - (a2[[3]][[nv3]][[1]] + w00223 a2[[3]][[nv3]][[2]] +
          w00323 a2[[3]][[nv3]][[3]] + w00423 a2[[3]][[nv3]][[4]])) / a2[[3]][[nv3]][[1]];
  diff23 = t23 - (w00123 a2[[3]][[nv3]][[1]] + w00223 a2[[3]][[nv3]][[2]] + w00323 a2[[3]][[nv3]][[3]] +
       w00423 a2[[3]][[nv3]][[4]]);
  {w00123, w00223, w00323, w00423}], {nv3, Table[k, {k, 1, 50, 1}]}]; abg23
```

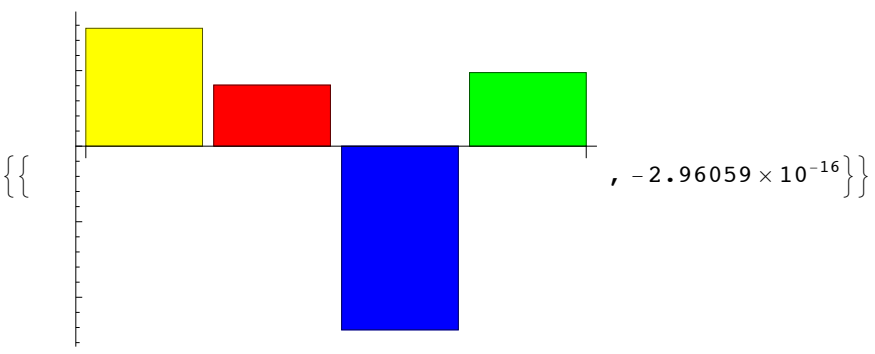
Out[27]=
```
{{2.75021, 0.71196, -3.5, 0.929688}, {0.476123, 0.894659, -1.18614, 0.98538},
 {2.14814, 0.82, -3.17894, 0.97332}, {1.54588, 0.8482, -2.31789, 0.989632}, {2.0144, 0.82, -2.87533, 0.965152},
 {4.60203, 0.82, -5.83021, 0.97332}, {-0.394036, 0.929688, -0.240312, 0.99292}, {3.50383, 0.8482, -4.57446, 0.989632},
 {2.02557, 0.929688, -2.87533, 0.989632}, {2.78773, 0.561952, -3.83916, 0.929688}, {0.412662, 0.752192, -1.18614, 0.98},
 {0.808731, 0.894659, -1.59692, 0.98538}, {1.15316, 0.82, -2.06281, 0.97332}, {0.301014, 0.929688, -1., 0.98},
 {0.40352, 0.872992, -1.18614, 0.943552}, {0.759293, 0.752192, -1.59692, 0.9553}, {1.24679, 0.82, -2.06281, 0.989632},
 {5.11514, 0.433952, -6.29238, 0.965152}, {6.06556, 0.913472, -7.28652, 0.9553}, {0.396814, 0.965152, -1., 0.997188},
 {1.61599, 0.752192, -2.58852, 0.9553}, {0.114791, 0.872992, -0.825961, 0.98}, {5.03306, 0.872992, -6.29238, 0.98},
 {0.134966, 0.894659, -0.825961, 0.989632}, {1.69569, 0.71196, -2.58852, 0.97332}, {2.47384, 0.752192, -3.5, 0.989632},
 {-0.00660852, 0.872992, -0.663488, 0.989632}, {0.13211, 0.82, -0.825961, 0.989632}, {1.4831, 0.872992, -2.31789, 0.97332},
 {1.89226, 0.82, -2.87533, 0.995392}, {2.71652, 0.872992, -3.83916, 0.98538}, {3.69767, 0.433952, -4.97197, 0.98},
 {1.4707, 0.872992, -2.31789, 0.965152}, {0.493517, 0.872992, -1.18614, 0.997188}, {1.67333, 0.913472, -2.31789, 0.998432},
 {2.56645, 0.82, -3.83916, 0.9553}, {1.49962, 0.667072, -2.31789, 0.943552}, {1.26891, 0.7881, -2.06281, 0.989632},
 {-0.00943253, 0.82, -0.663488, 0.989632}, {0.921078, 0.7881, -1.82269, 0.97332}, {1.38396, 0.7881, -2.31789, 0.943552},
 {0.349133, 0.7881, -1.18614, 0.9553}, {0.476123, 0.894659, -1.18614, 0.98538}, {2.22817, 0.752192, -3.17894, 0.9553},
 {1.65386, 0.71196, -2.58852, 0.929688}, {0.52902, 0.82, -1.38493, 0.9553}, {0.286279, 0.929688, -1., 0.98538},
 {0.581789, 0.82, -1.38493, 0.98}, {1.02859, 0.667072, -1.82269, 0.9553}, {0.475929, 0.82, -1.18614, 0.989632}}
```

In[28]:=
```
Total[abg23[[34]] a2[[3]][[34]]]
```

Out[28]=
```
1.
```

In[53]:=
```
{{BarChart[Total[abg23], ImageSize → 300, ChartStyle → {Yellow, Red, Blue, Green}], diff23 / 3}}
```

Out[53]=

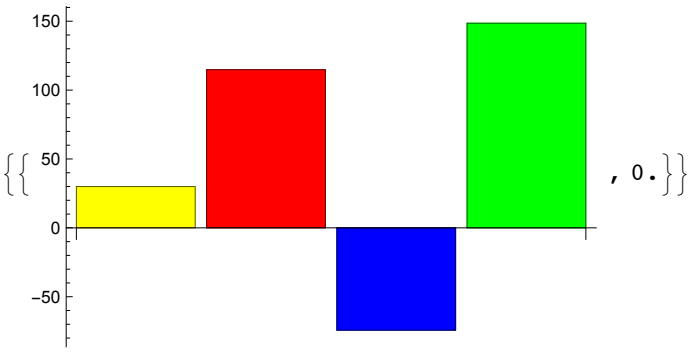


```
{{ , -2.96059 × 10^-16}}
```

TOTALS;

In[52]:=
```
{{BarChart[Total[abg + abg2 + abg23], ImageSize → 300, ChartStyle → {Yellow, Red, Blue, Green}], (diff + diff2 + diff23) / 3}}
```

Out[52]=

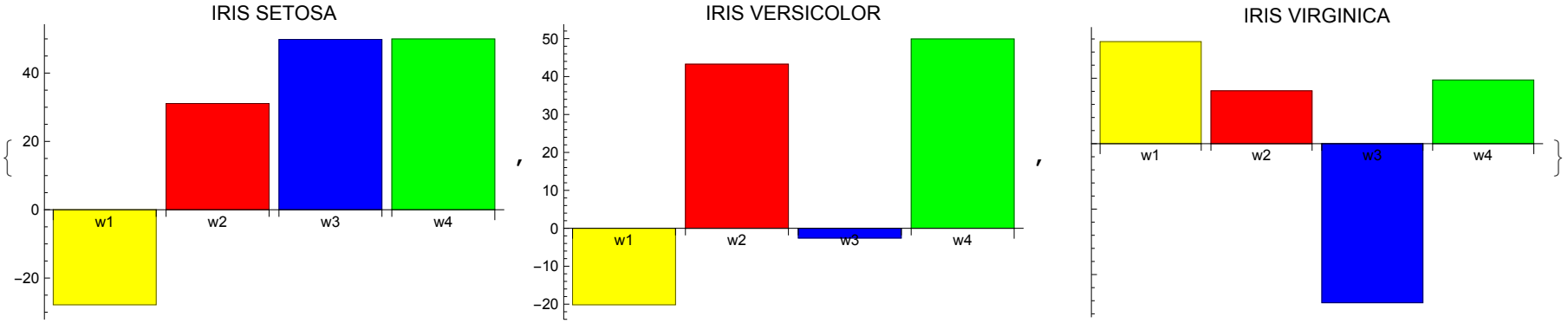



```
{{ , 0.}}
```

WEIGHTS FOR DIFFERENT FLOWER TYPES;

In[33]:=
```
{BarChart[Total[abg], ImageSize → 300, ChartStyle → {Yellow, Red, Blue, Green}, ChartLabels → {"w1", "w2", "w3", "w4"},
  PlotLabel → "IRIS SETOSA"], BarChart[Total[abg2], ImageSize → 300, ChartLabels → {"w1", "w2", "w3", "w4"},
  ChartStyle → {Yellow, Red, Blue, Green}, PlotLabel → "IRIS VERSICOLOR"], BarChart[Total[abg23], ImageSize → 300,
  ChartLabels → {"w1", "w2", "w3", "w4"}, ChartStyle → {Yellow, Red, Blue, Green}, PlotLabel → "IRIS VIRGINICA"]}
```

Out[33]=



In[35]:=
```
z = Total[Total[abg a2[[#]]]] / 50 & /@ {1, 2, 3}
```

Out[35]= {1., 3.99619, 5.73853}

In[36]:=
```
z2 = Total[Total[abg2 a2[[#]]]] / 50 & /@ {1, 2, 3}
```

Out[36]= {1.1236, 1., 1.6582}

In[37]:=
```
z3 = Total[Total[abg23 a2[[#]]]] / 50 & /@ {1, 2, 3}
```

Out[37]= {7.31617, 2.42879, 1.}

ACTIVATION FUNCTION; OUTPUT;

In[39]:=
```
thre = 1;
```

In[40]:=
```
{tt0 = thre - 1 / (1 + 2.71^-z[[#]]) & /@ {1, 2, 3}, If[tt0[[#]] == Max[tt0], 1, 0] & /@ {1, 2, 3}}
```

Out[40]= {{0.269542, 0.018271, 0.00326566}, {1, 0, 0}}

In[41]:=
```
{tt02 = thre - 1 / (1 + 2.71^-z2[[#]]) & /@ {1, 2, 3}, If[tt02[[#]] == Max[tt02], 1, 0] & /@ {1, 2, 3}}
```

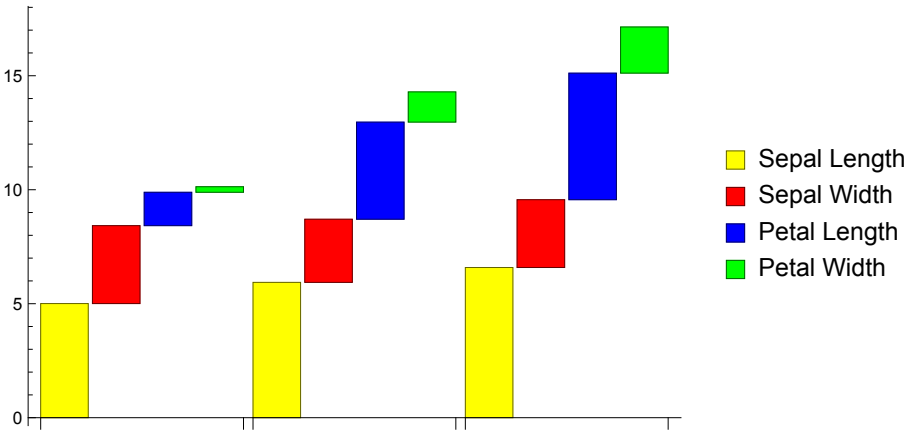
Out[41]= {{0.245979, 0.269542, 0.160685}, {0, 1, 0}}

In[42]:=
```
{tt03 = thre - 1 / (1 + 2.71^-z3[[#]]) & /@ {1, 2, 3}, If[tt03[[#]] == Max[tt03], 1, 0] & /@ {1, 2, 3}}
```

Out[42]= {{0.000679244, 0.0815572, 0.269542}, {0, 0, 1}}

In[44]:=
```
BarChart[Mean[a2[[#]]] & /@ {1, 2, 3}, ChartLayout → "Stepped", ChartStyle → {Yellow, Red, Blue, Green},
 ChartLegends → {"Sepal Length", "Sepal Width", "Petal Length", "Petal Width"}]
```

Out[44]=



In[45]:=
```
SIGMOID;
```

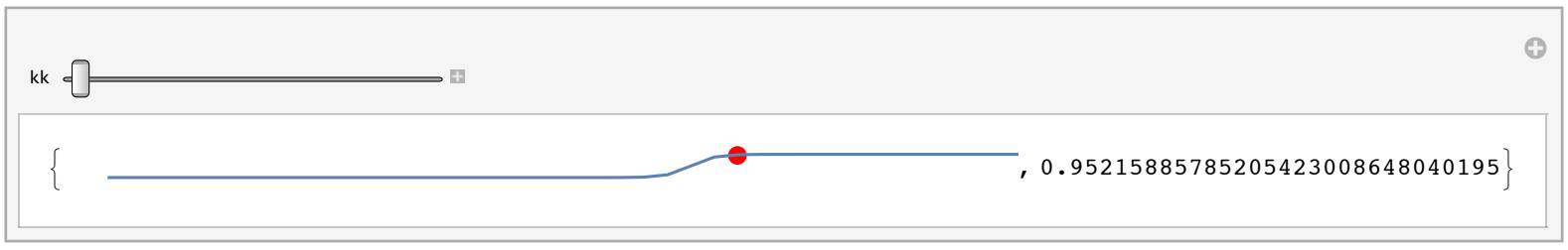
In[46]:=
```
1 / (1 + 2.71^-#) & /@ {1, 2, 3}
```

Out[46]= {0.730458, 0.880155, 0.952159}

In[47]:=
```
mm = 3;
```

In[48]:=
```
Manipulate[
 {Show[Graphics[{Red, Disk[{25 + mm, 1 / (1 + 2.71^-mm)}, .4]}, ImageSize → 500, PlotRange → {{-1, 40}, {-1, 1.5}}],
   ListLinePlot[1 / (1 + 2.71^-#) & /@ Table[k, {k, -50, 50, 2}], ImageSize → 500, PlotRange → {{-1, 40}, {-1, 1.5}}]],
  SetAccuracy[1 / (1 + 2.71^-mm), 30]}, {kk, 0, 5000, 1}]
```

Out[48]=



In[49]:=
```
HYPERBOLIC TANGENT;
```

In[50]:=
```
Tanh[1.1]
```

Out[50]= 0.800499

In[51]:=
```
Manipulate[
 {Show[Graphics[{Red, Disk[{5 + mm, Tanh[mm + .1]}, .4]}, ImageSize → 500, PlotRange → {{-1, 40}, {-1, 1.5}}], Plot[Tanh[x],
    {x, -50, 50}], ImageSize → 500, PlotRange → {{-20, 20}, {-2, 1.5}}], SetAccuracy[Tanh[mm + .1], 30]}, {kk, 0, 5000, 1}]
```

Out[51]=