



```

x1 = 1; x2 = x1 + 0.12; sz = 20;
y = Table[n, {n, 0, r = 0.0625, r/2}];
Graphics[{
  {PointSize[0.1], Red, Point[{x1, y[[1]]}}},
  {PointSize[0.1], Green, Point[{x1, y[[2]]}}},
  {PointSize[0.1], Blue, Point[{x1, y[[3]]}}},
  {Style[Text["X-Mean of the small red points", {x2, y[[1]]}], sz]},
  {Style[Text["X-Mean of the small green points", {x2, y[[2]]}], sz]},
  {Style[Text["X-Mean of the all the points", {x2, y[[3]]}], sz]}
}]

```

 X-Mean of the all the points

 X-Mean of the small green points

 X-Mean of the small red points

```

Export["ANOVA_Key.png",  of the all t  
the small c  
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ImageSize -> 350]

```

ANOVA_Key.png

```

Print[StringJoin["The 3F value is ",
  ToString[ANOVA[Join[xdata1, xdata2]][[1, 2, 1, 1, 4]]], " and the P value is ",
  ToString[NumberForm[ANOVA[Join[xdata1, xdata2]][[1, 2, 1, 1, 5]], 3]]]

```

```

mean = Table[nu = 100;
  data1 = RandomVariate[BinormalDistribution[{2, 0}, {1, 1}, 0], nu];
  data2 = RandomVariate[BinormalDistribution[{n, 0}, {1, 1}, 0], nu];
  xdata1 = Table[{1, data1[[r, 1]]}, {r, 1, nu, 1}];
  xdata2 = Table[{2, data2[[r, 1]]}, {r, 1, nu, 1}];
  ydata1 = Table[{1, data1[[r, 2]]}, {r, 1, nu, 1}];
  yData2 = Table[{2, data2[[r, 2]]}, {r, 1, nu, 1}];
  xcoor1 = Table[data1[[r, 1]], {r, 1, nu, 1}];
  xcoor2 = Table[data2[[r, 1]], {r, 1, nu, 1}];
Graphics[
  {
    {PointSize[0.003], Red, Point[data1]},
    {PointSize[0.02], Red, Point[{Mean[xcoor1], 0}]},
    {PointSize[0.003], Green, Point[data2]},
    {PointSize[0.02], Green, Point[{Mean[xcoor2], 0}]},
    {PointSize[0.02], Blue, Point[{Mean[Join[xcoor1, xcoor2]], 0]}},
    Style[Text[ANOVA[Join[xdata1, xdata2]][[1, 2, 1, 1, 5]], {6.25, 4}], Red],
    Style[Text["p-value: ", {3.75, 4}], Red]
  },
  PlotLabel → StringJoin["F value: ",
    ToString[N[ANOVA[Join[xdata1, xdata2]][[1, 2, 1, 1, 4]], 3]]],
  PlotRange → {{-4, 14}, {-5, 5}}
, {n, 2, 10, 0.05}];
Export["ANOVA_mean.gif", mean, ImageSize → 700]

```

ANOVA_mean.gif

```

mean = Table[nu = 100;
  data1 = RandomVariate[BinormalDistribution[{2, 0}, {1, 1}, 0], nu];
  data2 = RandomVariate[BinormalDistribution[{n, 0}, {1, 1}, 0], nu];
  xdata1 = Table[{1, data1[[r, 1]]}, {r, 1, nu, 1}];
  xdata2 = Table[{2, data2[[r, 1]]}, {r, 1, nu, 1}];
  ydata1 = Table[{1, data1[[r, 2]]}, {r, 1, nu, 1}];
  ydata2 = Table[{2, data2[[r, 2]]}, {r, 1, nu, 1}];
  xcoor1 = Table[data1[[r, 1]], {r, 1, nu, 1}];
  xcoor2 = Table[data2[[r, 1]], {r, 1, nu, 1}];
Graphics[
  {
    {PointSize[0.003], Red, Point[data1]}, {PointSize[0.02], Red, Point[{2, 0]}},
    {PointSize[0.003], Green, Point[data2]}, {PointSize[0.02], Green, Point[{n, 0]}},
    {PointSize[0.02], Blue, Point[{Mean[{2, n}], 0]}},
    Style[Text[ANOVA[Join[xdata1, xdata2]][[1, 2, 1, 1, 5]], {6.25, 4}], Red],
    Style[Text["p-value: ", {3.75, 4}], Red]
  },
  PlotLabel → StringJoin["F value: ",
    ToString[N[ANOVA[Join[xdata1, xdata2]][[1, 2, 1, 1, 4]], 3]]],
  PlotRange → {{-4, 14}, {-5, 5}}]
, {n, 2, 10, 0.05}];
Export["ANOVA_theo_mean.gif", mean, ImageSize → 700]

```

ANOVA_theo_mean.gif

```

mean = Table[nu = 500;
  a1 = 2;
  a2 = 6;
  data1 = RandomVariate[BinormalDistribution[{a1, 0}], {n, 1}, 0], nu];
  data2 = RandomVariate[BinormalDistribution[{a2, 0}], {n, 1}, 0], nu];
  xdata1 = Table[{1, data1[[r, 1]]}, {r, 1, nu, 1}];
  xdata2 = Table[{2, data2[[r, 1]]}, {r, 1, nu, 1}];
  ydata1 = Table[{1, data1[[r, 2]]}, {r, 1, nu, 1}];
  yData2 = Table[{2, data2[[r, 2]]}, {r, 1, nu, 1}];
  xcoor1 = Table[data1[[r, 1]], {r, 1, nu, 1}];
  xcoor2 = Table[data2[[r, 1]], {r, 1, nu, 1}];
Graphics[
  {
    {PointSize[0.001], Red, Point[data1]}, {PointSize[0.02], Red, Point[{a1, 0}]},
    {PointSize[0.001], Green, Point[data2]}, {PointSize[0.02], Green, Point[{a2, 0}]},
    {PointSize[0.02], Blue, Point[{(a1 + a2) / 2, 0}]},
    Style[Text[ANOVA[Join[xdata1, xdata2]][[1, 2, 1, 1, 5]], {5.50, 4}], Red, 12],
    Style[Text["p-value: ", {2.75, 4}], Red, 12]
  },
  PlotLabel → StringJoin["F value: ",
    ToString[N[ANOVA[Join[xdata1, xdata2]][[1, 2, 1, 1, 4]], 3]]],
  PlotRange → {{-4, 12}, {-5, 5}}]
, {n, 3, 0.2, -0.1}];
Export["ANOVA_stndrd.gif", mean, ImageSize → 700, "DisplayDurations" → .75]
ANOVA_stndrd.gif

```

```

mean = Table[nu = n;
  a1 = 2;
  a2 = 6;
  data1 = RandomVariate[BinormalDistribution[{a1, 0}], {1, 1}, 0], nu];
  data2 = RandomVariate[BinormalDistribution[{a2, 0}], {1, 1}, 0], nu];
  xdata1 = Table[{1, data1[[r, 1]]}, {r, 1, nu, 1}];
  xdata2 = Table[{2, data2[[r, 1]]}, {r, 1, nu, 1}];
  ydata1 = Table[{1, data1[[r, 2]]}, {r, 1, nu, 1}];
  yData2 = Table[{2, data2[[r, 2]]}, {r, 1, nu, 1}];
  xcoor1 = Table[data1[[r, 1]], {r, 1, nu, 1}];
  xcoor2 = Table[data2[[r, 1]], {r, 1, nu, 1}];
Graphics[
  {
    {PointSize[0.001], Red, Point[data1]}, {PointSize[0.02], Red, Point[{a1, 0}]},
    {PointSize[0.001], Green, Point[data2]}, {PointSize[0.02], Green, Point[{a2, 0}]},
    {PointSize[0.02], Blue, Point[{(a1 + a2) / 2, 0}]},
    Style[Text[ANOVA[Join[xdata1, xdata2]][[1, 2, 1, 1, 5]], {5.50, 4}], Red, 12],
    Style[Text["p-value: ", {2.75, 4}], Red, 12]
  },
  PlotLabel → StringJoin["F value: ",
    ToString[N[ANOVA[Join[xdata1, xdata2]][[1, 2, 1, 1, 4]], 3]]],
  PlotRange → {{-4, 12}, {-5, 5}}]
, {n, 100, 2000, 50}];
Export["ANOVA_density.gif", mean, ImageSize → 700, "DisplayDurations" → .75]
ANOVA_density.gif

```