Modeling Yeast Growth

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Notebook to support Exercise 2.2.8, modeling yeast population growth.

The data, in time/population pairs:

In[2]:=
```
data = {{0, 9.6}, {1, 18.3}, {2, 29}, {3, 47.2}, {4, 71.1}, {5, 119.1},
  {6, 174.6}, {7, 257.3}, {8, 350.7}, {9, 441}, {10, 513.3}, {11, 559.7},
  {12, 594.8}, {13, 629.4}, {14, 640.8}, {15, 651.1}, {16, 655.9}, {17, 659.6}}
```

A plot:

In[20]:=
```
plt1 =
 ListPlot[data, AxesLabel → {"time (hours)", "Population (millions)"}, PlotStyle → {Red}]
```

Given that u(0) = 9.6, the solution to the logistic equation with intrinsic growth rate "r" and carrying capacity "K" is

In[6]:=
```
u[t_] = K / (1 + Exp[- r * t] * (K / 9.6 - 1))
```

Take a guess r = 1 and K = 600, plot, compare to the data

In[21]:=
```
plt2 = Plot[u[t] /. {r → 1, K → 600}, {t, 0, 17}, PlotStyle → {Blue}];
Show[plt1, plt2]
```

Perhaps we can do better...