WEEK-4

List

In[107]:=
```
List[1, 2, 3, 4, 5]
```
Out[107]= {1, 2, 3, 4, 5}

In[108]:=
```
{1, 2, 3, 4, 5}
```
Out[108]= {1, 2, 3, 4, 5}

In[109]:=
```
Range[5, 10]
```
Out[109]= {5, 6, 7, 8, 9, 10}

In[110]:=
```
Range[1, 10]
```
Out[110]= {1, 2, 3, 4, 5, 6, 7, 8, 9, 10}

In[111]:=
```
Range[5, 10, 1/2]
```
Out[111]= $\left\{5, \frac{11}{2}, 6, \frac{13}{2}, 7, \frac{15}{2}, 8, \frac{17}{2}, 9, \frac{19}{2}, 10\right\}$

In[112]:=
```
Range[10]^2
```
Out[112]= {1, 4, 9, 16, 25, 36, 49, 64, 81, 100}

In[113]:=
```
{1, 2, 3}^2 + 2
```
```
{3, 6, 11}
```

In[117]:=
```
Clear[b]
```

In[118]:=
```
{a, b} + {x, y}
```
Out[118]= {a + x, b + y}

In[119]:=
```
{a, b} * {x, y}
```
Out[119]= {a x, b y}

In[120]:=
```
j = Range[3]
```
Out[120]= {1, 2, 3}

In[121]:=
```
Append[j, 4]
```
Out[121]= {1, 2, 3, 4}

In[122]:=
```
Prepend[j, 0]
```
Out[122]= {0, 1, 2, 3}

In[123]:=
```
Join[{a, c, d}, {f, h}]
```
Out[123]= {a, c, d, f, h}

In[127]:=
```
Clear[k]
Clear[l]
```

In[129]:=
```
Sort[{a, m, k, l, b}]
```
Out[129]= {a, b, k, l, m}

Table:

In[130]:=
```
Table[i^2, {i, 10}]
```
Out[130]= {1, 4, 9, 16, 25, 36, 49, 64, 81, 100}

In[132]:=
```
Table[y, 20]
```
Out[132]= {y, y, y, y, y, y, y, y, y, y, y, y, y, y, y, y, y, y, y, y}

Pascal's triangle:

```
Binomial[5, 3] (* n!/(k! * (n-k)!) = 5!/(3!*(5-3)!) *)
```
Out[131]= 10

```
Binomial[10, 5] (* n!/(k! * (n-k)!) = 10!/(5!*(10-5)!) *)
```
Out[133]= 252

In[134]:=
```
Column[Table[Binomial[n, k], {n, 0, 5}, {k, 0, n}], Center]
```
Out[134]=
```
      {1}
    {1, 1}
  {1, 2, 1}
 {1, 3, 3, 1}
{1, 4, 6, 4, 1}
{1, 5, 10, 10, 5, 1}
```

In[135]:=
```
Column[{1, 12, 123, 1234}, Center]
```
Out[135]=
```
  1
 12
123
1234
```

In[136]:=
```
Column[Table[Prime[i], {i, 3}]]
```

Out[136]=
```
2
3
5
```

In[138]:=
```
Column[Table[Prime[i], {i, 6}]]
```

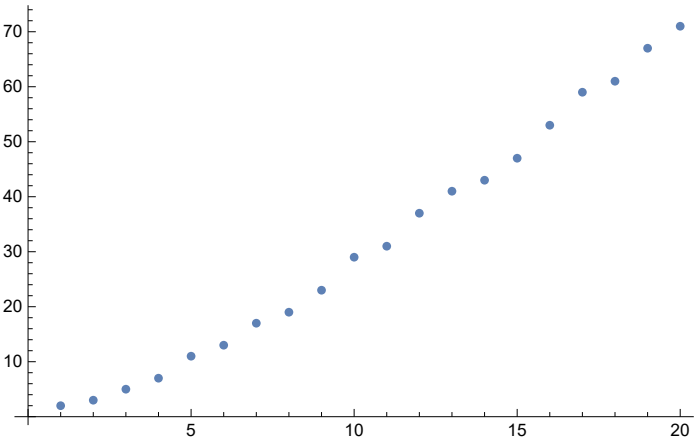
Out[138]=
```
2
3
5
7
11
13
```

In[139]:=
```
Column[Table[Binomial[n, k], {n, 0, 10}, {k, 0, n}], Center]
```

Out[139]=
```
                          {1}
                        {1, 1}
                      {1, 2, 1}
                    {1, 3, 3, 1}
                  {1, 4, 6, 4, 1}
                {1, 5, 10, 10, 5, 1}
              {1, 6, 15, 20, 15, 6, 1}
            {1, 7, 21, 35, 35, 21, 7, 1}
          {1, 8, 28, 56, 70, 56, 28, 8, 1}
        {1, 9, 36, 84, 126, 126, 84, 36, 9, 1}
      {1, 10, 45, 120, 210, 252, 210, 120, 45, 10, 1}
```

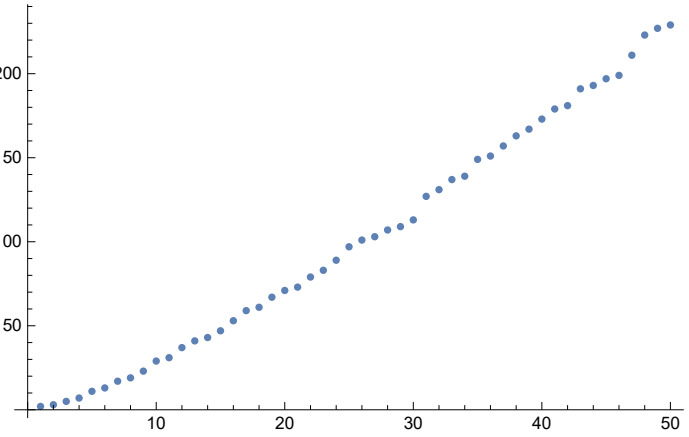
In[140]:=
```
ListPlot[Table[Prime[i], {i, 20}]]
```

Out[140]=



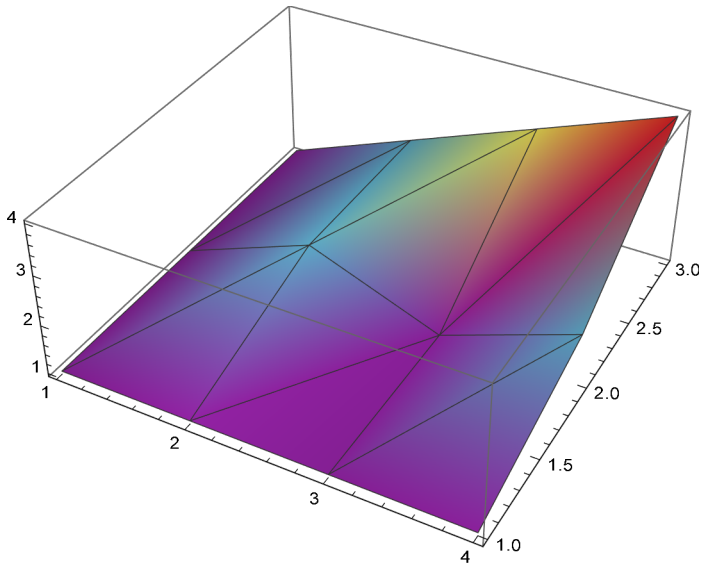
In[141]:=
```
ListPlot[Table[Prime[i], {i, 50}]]
```

Out[141]=



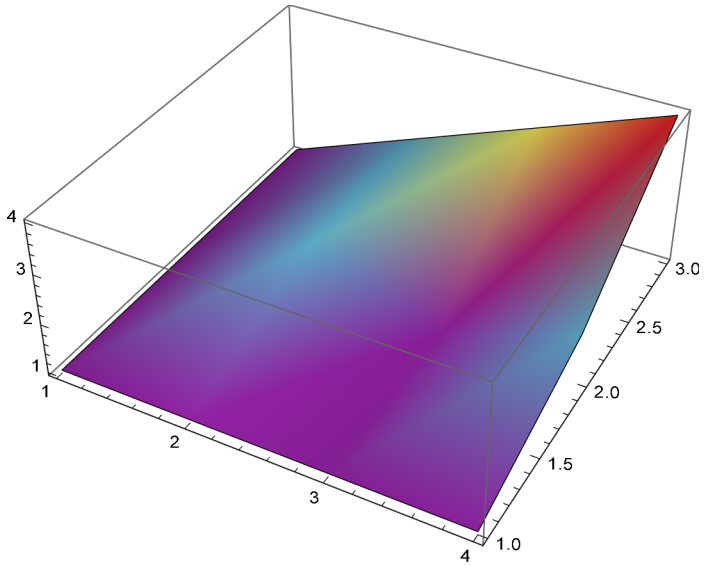
In[142]:=
```
ListPlot3D[{{1, 1, 1, 1}, {1, 2, 1, 2}, {1, 1, 3, 1} {1, 2, 1, 4}},
 Mesh → All, ColorFunction → "Rainbow"]
```

Out[142]=



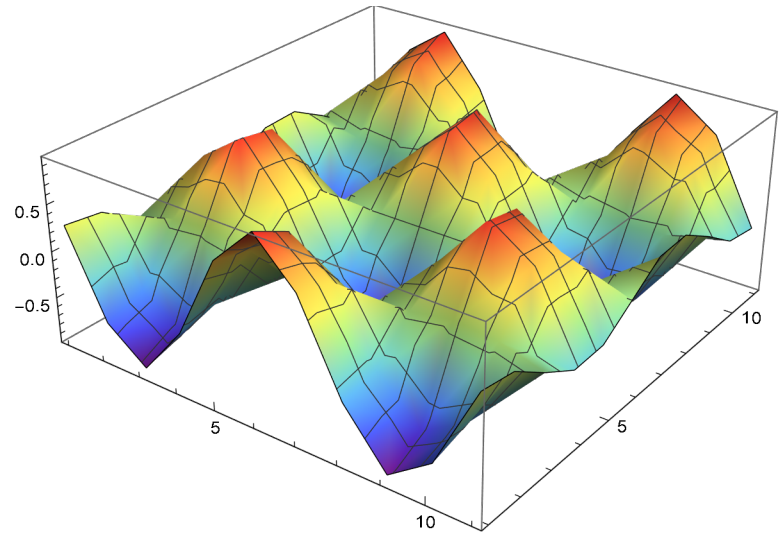
In[143]:=
```
ListPlot3D[{{1, 1, 1, 1}, {1, 2, 1, 2}, {1, 1, 3, 1} {1, 2, 1, 4}},
 Mesh → None, ColorFunction → "Rainbow"]
```

Out[143]=



In[144]:=
```
ListPlot3D[Table[Sin[i] * Cos[j], {i, -5, 5}, {j, -5, 5}], ColorFunction → "Rainbow"]
```

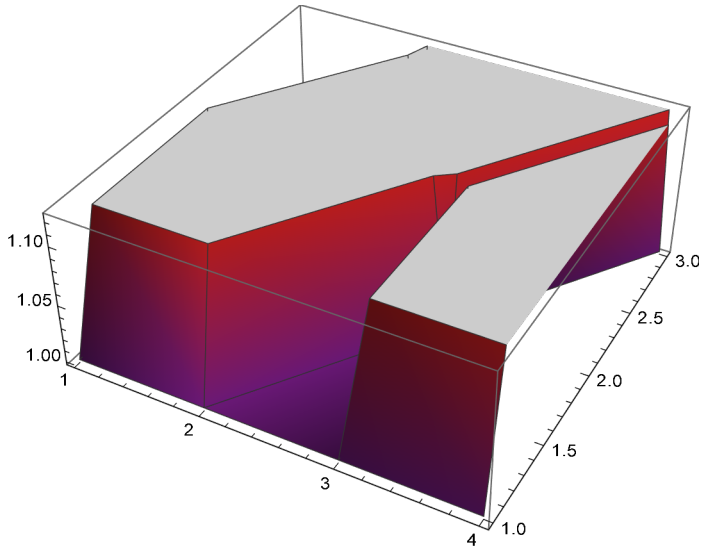
Out[144]=




```
ListPlot3D[Table[Sin[i] × Cos[j], {i, -5, 5}, {j, -5, 5}],
 Mesh → Automatic, MeshFunctions → Automatic, ColorFunction → "Rainbow"]
```

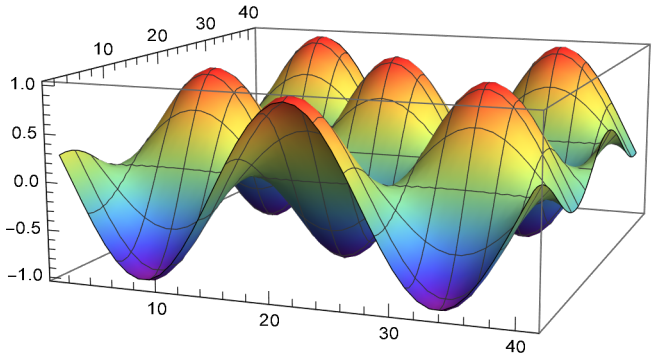
In[145]:=
```
ListPlot3D[{{1, 1, 1, 1}, {1, 2, 1, 2}, {1, 1, 3, 1}},
 Mesh → All, ColorFunction → "Rainbow"]
```

Out[145]=



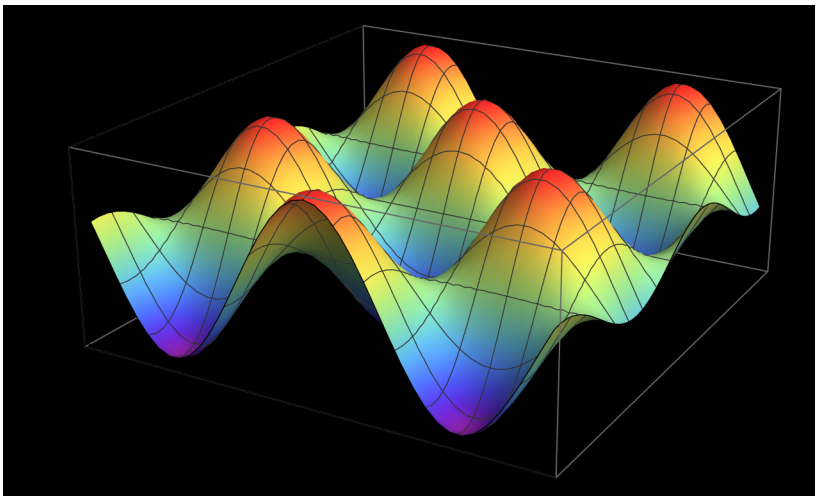
In[146]:=
```
ListPlot3D[Table[Sin[i] * Cos[j], {i, -5, 5, 0.25}, {j, -5, 5, 0.25}],
 ColorFunction → "Rainbow"]
```

In[152]:=



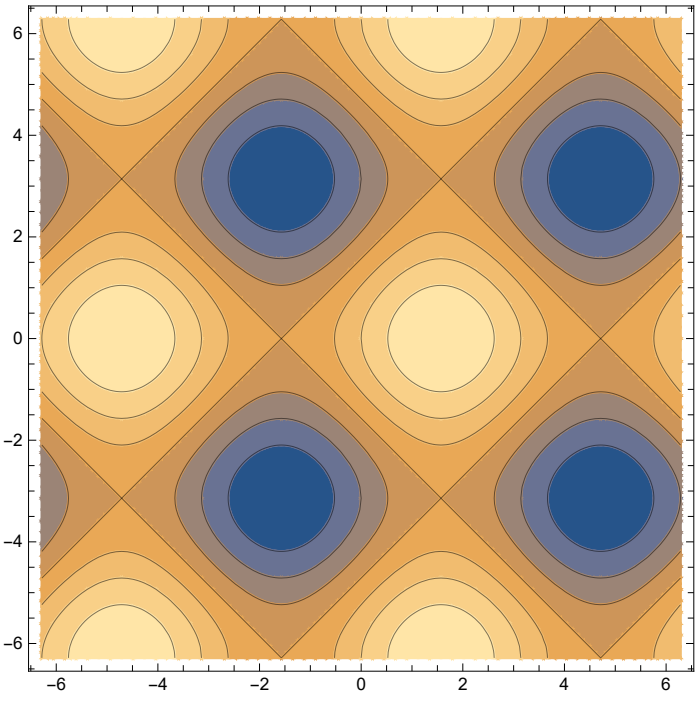
In[153]:=
```
Show[%152, Background → Black]
```

Out[153]=



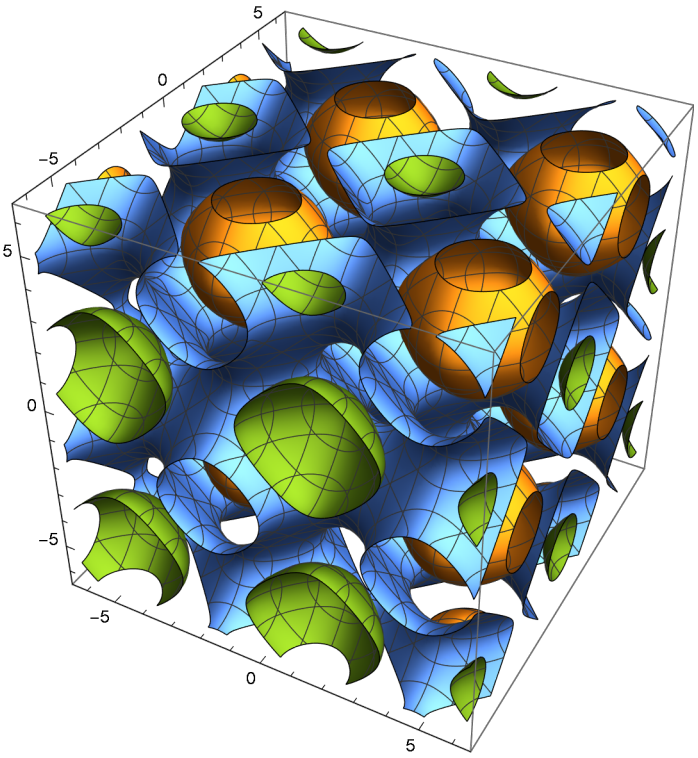
In[155]:=
```
ContourPlot[Sin[x] + Cos[y], {x, -2 Pi, 2 Pi}, {y, -2 Pi, 2 Pi}]
```

Out[155]=



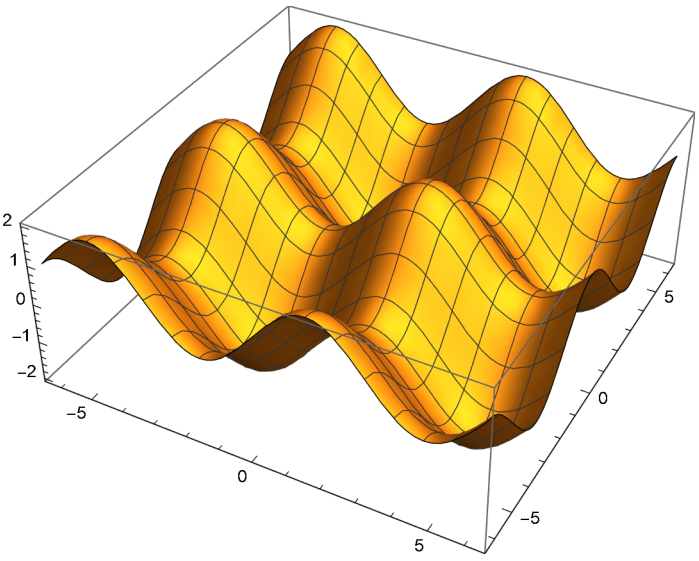
In[156]:=
```
ContourPlot3D[Sin[x] + Cos[y] + Sin[z], {x, -2 Pi, 2 Pi}, {y, -2 Pi, 2 Pi}, {z, -2 Pi, 2 Pi}]
```

Out[156]=



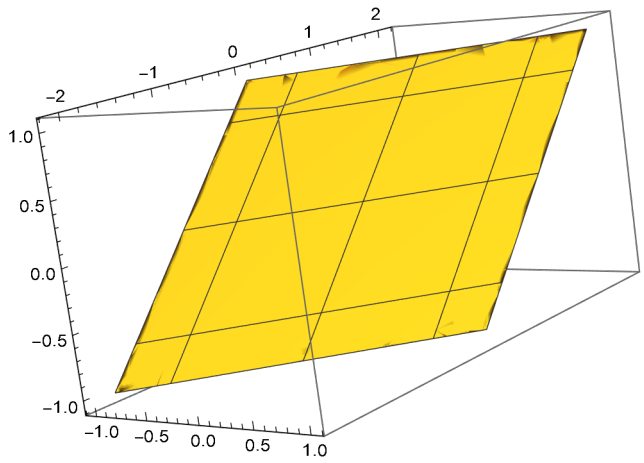
In[160]:=
```
graph1 = Plot3D[Sin[x] + Cos[y], {x, -2 Pi, 2 Pi}, {y, -2 Pi, 2 Pi}]
```

Out[160]=



In[161]:=
```
graph2 =
 ParametricPlot3D[{Sin[u], Sin[u] + Cos[v], Cos[v]}, {u, -2 Pi, 2 Pi}, {v, -2 Pi, 2 Pi}]
```

Out[161]=

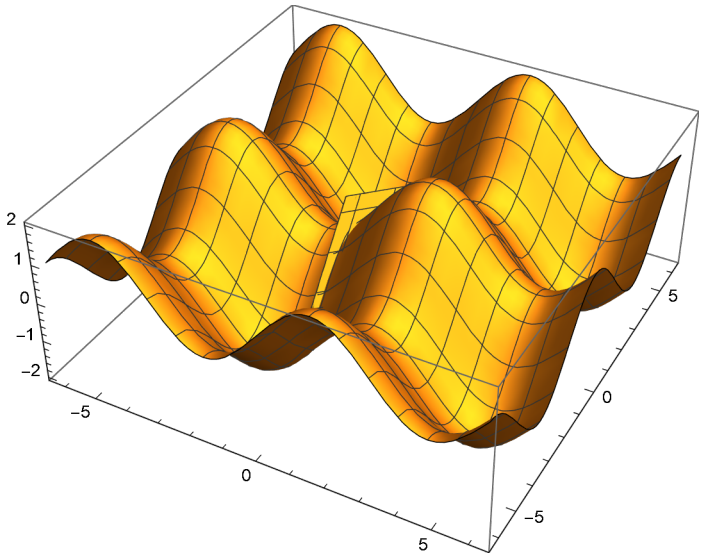


In[159]:=
```
Show[graph1, graph2]
```

Show: Could not combine the graphics objects in Show[graph1, graph2].

In[163]:=
```
Show[graph1, graph2]
```

Out[163]=



In[165]:=
```
Show[%163, Background → Black]
```

Out[165]=