The Solar Day as a Frequency

Period = 1/frequency

Frequency = 1/Period

resonance by day length = Freq 2/Freq 1

Freq 1 is the root frequency

If Freq 2 is larger than Frequency 1, and Log2 C = K and 2^k = C.
2^k2/2^k1 = 2^(k2-k1)

If k2 is larger than k1, we need only the fractional part to determine the musical number equal to or between 1 and 2.

If k2 is smaller than k1, we have a negative number as the power of 2. To easily calculate the musical number we can simply times the ratio by 2 until the number is at least greater than 1. Then all numbers will satisfy the simple equation where only the fractional part is extracted to find the musical number in question.

planfreq=List[1/Entity[“Planet”,”Mars”][“SolarDay”],1/Entity[“Planet”,”Mercury”][“SolarDay”],

In[1]:=
```
SolDays = List[624, 4222.6, 2802, 24, 24.66, 9, 9.9, 10.7, 17.2, 16.1, 153.3, 25.9, 708.7]
```

Out[1]=
```
{624, 4222.6, 2802, 24, 24.66, 9, 9.9, 10.7, 17.2, 16.1, 153.3, 25.9, 708.7}
```

In[2]:=
```
freqsoldays = 1 / SolDays
```

Out[2]=
$$\left\{\frac{1}{624}, 0.000236821, \frac{1}{2802}, \frac{1}{24}, 0.0405515, \frac{1}{9}, 0.10101, 0.0934579, 0.0581395, 0.0621118, 0.00652316, 0.03861, 0.00141103\right\}$$

In[3]:=
```
freqtodaysscales = 1 / (SolDays * 3600)
```

Out[3]=
$$\left\{\frac{1}{2\,246\,400}, 6.57836\times10^{-8}, \frac{1}{10\,087\,200}, \frac{1}{86\,400}, 0.0000112643, \frac{1}{32\,400}, 0.0000280584, 0.0000259605, 0.0000161499, 0.0000172533, 1.81199\times10^{-6}, 0.000010725, 3.91954\times10^{-7}\right\}$$

In[4]:=
```
N[freqtodaysscales, 6]
```

Out[4]=
$$\left\{4.45157 \times 10^{-7},\ 6.57836 \times 10^{-8},\ 9.91355 \times 10^{-8},\ 0.0000115741,\ 0.0000112643,\ 0.0000308642,\ 0.0000280584,\ 0.0000259605,\ 0.0000161499,\ 0.0000172533,\ 1.81199 \times 10^{-6},\ 0.000010725,\ 3.91954 \times 10^{-7}\right\}$$

In[5]:=
```
2^13
```

Out[5]=
```
8192
```

In[6]:=
```
N[freqtodaysscales * 2^25, 6]
```

Out[6]=
```
{14.9370, 2.20733, 3.32644, 388.361, 377.967, 1035.63,
 941.482, 871.091, 541.9, 578.924, 60.8002, 359.872, 13.1518}
```

In[7]:=
```
sunrootdays = freqsoldays / (1 / 624)
```

Out[7]=
$$\left\{1,\ 0.147776,\ \frac{104}{467},\ 26,\ 25.3041,\ \frac{208}{3},\ 63.0303,\ 58.3178,\ 36.2791,\ 38.7578,\ 4.07045,\ 24.0927,\ 0.880485\right\}$$

In[8]:=
```
N[freqtodaysscales] * 2^28
```

Out[8]=
```
{119.496, 17.6586, 26.6115, 3106.89, 3023.74, 8285.04,
 7531.86, 6968.73, 4335.2, 4631.39, 486.402, 2878.97, 105.214}
```

In[9]:=
```
solardaysintervals = N[2^FractionalPart[Log[2, freqtodaysscales]]] * 2
```

Out[9]=
```
{1.86712, 1.10367, 1.66322, 1.51704, 1.47644, 1.01136,
 1.83883, 1.70135, 1.0584, 1.13071, 1.90001, 1.40575, 1.64397}
```

In[10]:=
```
solardaysintervals * 512
```

Out[10]=
```
{955.967, 565.077, 851.568, 776.723, 755.935, 517.815,
 941.482, 871.091, 541.9, 578.924, 972.804, 719.743, 841.715}
```

In[11]:=
```
solardaysintervals * 256
```

Out[11]=
```
{477.983, 282.538, 425.784, 388.361, 377.967, 258.908,
 470.741, 435.546, 270.95, 289.462, 486.402, 359.872, 420.857}
```

In[12]:=
```
.147776 * 8
```

Out[12]=
```
1.18221
```

In[13]:=
```
N[2^FractionalPart[Log[2, sunrootdays]]]
```

Out[13]=
```
{1., 0.591105, 0.890792, 1.625, 1.58151, 1.08333,
 1.9697, 1.82243, 1.13372, 1.21118, 1.01761, 1.50579, 0.880485}
```

In[14]:=
```
N[2^FractionalPart[Log[2, sunrootdays * 1024]]]
```

Out[14]=
```
{1., 1.18221, 1.78158, 1.625, 1.58151, 1.08333,
 1.9697, 1.82243, 1.13372, 1.21118, 1.01761, 1.50579, 1.76097}
```

In[15]:=
```
2 * N[2^FractionalPart[Log[2, sunrootdays]]]
```

Out[15]=
```
{2., 1.18221, 1.78158, 3.25, 3.16302, 2.16667,
 3.93939, 3.64486, 2.26744, 2.42236, 2.03523, 3.01158, 1.76097}
```

In[16]:=
```
mercrootdays = freqsoldays / 0.00023682091602330316`
```
Out[16]=
```
{6.76699, 1., 1.507, 175.942, 171.233, 469.178,
 426.525, 394.636, 245.5, 262.273, 27.5447, 163.035, 5.95823}
```

In[17]:=
```
N[2^FractionalPart[Log[2, mercrootdays]]]
```
Out[17]=
```
{1.69175, 1., 1.507, 1.37454, 1.33776, 1.83273,
 1.66611, 1.54154, 1.91797, 1.02451, 1.72154, 1.27371, 1.48956}
```

In[18]:=

In[19]:=
```
venusrootdays = freqsoldays / (1/2802)
```
Out[19]=
$$\left\{\frac{467}{104}, 0.663572, 1, \frac{467}{4}, 113.625, \frac{934}{3}, 283.03,\right.$$
$$\left.261.869, 162.907, 174.037, 18.2779, 108.185, 3.95372\right\}$$

In[20]:=
```
N[2^FractionalPart[Log[2, venusrootdays * 1024]]]
```
Out[20]=
```
{1.1226, 1.32714, 1., 1.82422, 1.7754, 1.21615,
 1.10559, 1.02293, 1.27271, 1.35967, 1.14237, 1.6904, 1.97686}
```

In[21]:=
```
earthrootdays = freqsoldays / (1 / 24)
```
Out[21]=
$$\left\{\frac{1}{26}, 0.0056837, \frac{4}{467}, 1, 0.973236, \frac{8}{3}, 2.42424,\right.$$
$$\left.2.24299, 1.39535, 1.49068, 0.156556, 0.926641, 0.0338648\right\}$$

In[22]:=
```
N[2^FractionalPart[Log[2, earthrootdays * 1024]]]
```
Out[22]=
```
{1.23077, 1.45503, 1.09636, 1., 1.94647, 1.33333,
 1.21212, 1.1215, 1.39535, 1.49068, 1.25245, 1.85328, 1.08367}
```

In[23]:=
```
2 * N[2^FractionalPart[Log[2, earthrootdays]]]
```
Out[23]=
```
{1.23077, 1.45503, 1.09636, 2., 1.94647, 2.66667,
 2.42424, 2.24299, 2.7907, 2.98137, 1.25245, 1.85328, 1.08367}
```

In[24]:=
```
freqsoldays
```
Out[24]=
$$\left\{\frac{1}{624}, 0.000236821, \frac{1}{2802}, \frac{1}{24}, 0.0405515, \frac{1}{9}, 0.10101,\right.$$
$$\left.0.0934579, 0.0581395, 0.0621118, 0.00652316, 0.03861, 0.00141103\right\}$$

In[112]:=
```
marsrootdays = freqsoldays / 0.040551500405515`
```
Out[112]=
```
{0.0395192, 0.00584, 0.00880086, 1.0275, 1., 2.74,
 2.49091, 2.30467, 1.43372, 1.53168, 0.160861, 0.952124, 0.0347961}
```

In[113]:=
```
N[2^FractionalPart[Log[2, marsrootdays * 1024]]]
```
Out[113]=
```
{1.26462, 1.49504, 1.12651, 1.0275, 1., 1.37,
 1.24545, 1.15234, 1.43372, 1.53168, 1.28689, 1.90425, 1.11348}
```

In[27]:= **ceresrootdays = freqsoldays / $\left(\frac{1}{9}\right)$**

Out[27]= $\left\{\frac{3}{208}, 0.00213139, \frac{3}{934}, \frac{3}{8}, 0.364964, 1, 0.909091, 0.841121, 0.523256, 0.559006, 0.0587084, 0.34749, 0.0126993\right\}$

In[28]:= **N[2^FractionalPart[Log[2, ceresrootdays * 1024]]]**

Out[28]= {1.84615, 1.09127, 1.64454, 1.5, 1.45985, 1., 1.81818, 1.68224, 1.04651, 1.11801, 1.87867, 1.38996, 1.62551}

In[29]:= **jupiterrootdays = freqsoldays / 0.10101010101010101`**

Out[29]= {0.0158654, 0.00234453, 0.00353319, 0.4125, 0.40146, 1.1, 1., 0.925234, 0.575581, 0.614907, 0.0645793, 0.382239, 0.0139692}

In[30]:= **N[2^FractionalPart[Log[2, jupiterrootdays * 1024]]]**

Out[30]= {1.01538, 1.2004, 1.80899, 1.65, 1.60584, 1.1, 1., 1.85047, 1.15116, 1.22981, 1.03327, 1.52896, 1.78806}

In[31]:= **saturnrootdays = freqsoldays / 0.09345794392523366`**

Out[31]= {0.0171474, 0.00253398, 0.0038187, 0.445833, 0.433901, 1.18889, 1.08081, 1., 0.622093, 0.664596, 0.0697978, 0.413127, 0.0150981}

In[32]:= **N[2^FractionalPart[Log[2, saturnrootdays * 1024]]]**

Out[32]= {1.09744, 1.2974, 1.95517, 1.78333, 1.7356, 1.18889, 1.08081, 1., 1.24419, 1.32919, 1.11676, 1.65251, 1.93255}

In[33]:= **uranusrootdays = freqsoldays / 0.05813953488372093`**

Out[33]= {0.0275641, 0.00407332, 0.00613847, 0.716667, 0.697486, 1.91111, 1.73737, 1.60748, 1., 1.06832, 0.112198, 0.664093, 0.0242698}

In[34]:= **N[2^FractionalPart[Log[2, uranusrootdays * 1024]]]**

Out[34]= {1.7641, 1.04277, 1.57145, 1.43333, 1.39497, 1.91111, 1.73737, 1.60748, 1., 1.06832, 1.79517, 1.32819, 1.55327}

In[35]:= **neptunerootdays = freqsoldays / 0.06211180124223602`**

Out[35]= {0.0258013, 0.00381282, 0.0057459, 0.670833, 0.652879, 1.78889, 1.62626, 1.50467, 0.936047, 1., 0.105023, 0.621622, 0.0227177}

In[36]:= **N[2^FractionalPart[Log[2, neptunerootdays * 1024]]]**

Out[36]= {1.65128, 1.95216, 1.47095, 1.34167, 1.30576, 1.78889, 1.62626, 1.50467, 1.87209, 1., 1.68037, 1.24324, 1.45393}

In[37]:= **plutorootdays = freqsoldays / 0.0065231572080887715`**

Out[37]= {0.245673, 0.0363046, 0.0547109, 6.3875, 6.21655, 17.0333, 15.4848, 14.3271, 8.91279, 9.52174, 1., 5.91892, 0.216312}

In[38]:=
```
N[2^FractionalPart[Log[2, plutorootdays * 1024]]]
```

Out[38]=
```
{1.96538, 1.16175, 1.75075, 1.59687, 1.55414,
 1.06458, 1.93561, 1.79089, 1.1141, 1.19022, 1., 1.47973, 1.73049}
```

In[39]:=
```
erisrootdays = freqsoldays / 0.03861003861003861`
```

Out[39]=
```
{0.0415064, 0.00613366, 0.0092434, 1.07917, 1.05028,
 2.87778, 2.61616, 2.42056, 1.50581, 1.6087, 0.16895, 1., 0.0365458}
```

In[40]:=
```
N[2^FractionalPart[Log[2, erisrootdays * 1024]]]
```

Out[40]=
```
{1.32821, 1.57022, 1.18315, 1.07917, 1.05028,
 1.43889, 1.30808, 1.21028, 1.50581, 1.6087, 1.3516, 1., 1.16947}
```

In[41]:=
```
moonrootdays = freqsoldays / 0.0014110342881332016`
```

Out[41]=
```
{1.13574, 0.167835, 0.252926, 29.5292, 28.7388,
 78.7444, 71.5859, 66.2336, 41.2035, 44.0186, 4.62296, 27.3629, 1.}
```

In[42]:=
```
moonscaledays = N[2^FractionalPart[Log[2, moonrootdays * 1024]]]
```

Out[42]=
```
{1.13574, 1.34268, 1.01171, 1.84557, 1.79618,
 1.23038, 1.11853, 1.0349, 1.28761, 1.37558, 1.15574, 1.71018, 1.}
```

---

for establishing all intervals from the perfect fift

In[ ]:=
```
p5 = N[2^(7/12)]
```

Out[ ]=
```
1.49831
```

In[ ]:=
```
p5toall12 = Table[p5^n, {n, 0, 12}]
```

Out[ ]=
```
{1., 1.49831, 2.24492, 3.36359, 5.03968, 7.55099,
 11.3137, 16.9514, 25.3984, 38.0546, 57.0175, 85.4298, 128.}
```

In[ ]:=
```
N[2^FractionalPart[Log[2, p5toall12]]]
```

Out[ ]=
```
{1., 1.49831, 1.12246, 1.68179, 1.25992, 1.88775,
 1.41421, 1.05946, 1.5874, 1.18921, 1.7818, 1.33484, 1.}
```

In[ ]:=
```
twelvetet = Table[N[2^(n/12)], {n, 0, 12}]
```

Out[ ]=
```
{1., 1.05946, 1.12246, 1.18921, 1.25992, 1.33484,
 1.41421, 1.49831, 1.5874, 1.68179, 1.7818, 1.88775, 2.}
```

In[ ]:=
```
numbers in moonscaledays within 1% of any number in twelvetet
```

Out[ ]=
```
Failure[
```

Message: A network operation timed out. Please try again later.
Tag: TimedOut
Query: numbers in moonscaledays within 1% of any number in twelvetet

```
]
```

In[ ]:=

In[ ]:=
```
>>Music
```

StartExternalSession: No valid installations for system Python were found with the options specified.

Out[ ]= $Failed

In[ ]:=
```
<< Music`
```

In[ ]:=
```
TemperedChromatic
```

Out[ ]= {0, 100, 200, 300, 400, 500, 600, 700, 800, 900, 1000, 1100, 1200}

In[ ]:=
```
for establishing all intervals from the perfect fourth
```

Out[ ]= all establishing for fourth from intervals perfect the

In[ ]:=
```
perfect4th = N[2^(5/12)]
```

Out[ ]= 1.33484

In[ ]:=
```
p4toall12 = Table[perfect4th^n, {n, 0, 12}]
```

Out[ ]= {1., 1.33484, 1.7818, 2.37841, 3.1748, 4.23785,
5.65685, 7.55099, 10.0794, 13.4543, 17.9594, 23.9729, 32.}

In[ ]:=
```
N[2^FractionalPart[Log[2, p4toall12]]]
```

Out[ ]= {1., 1.33484, 1.7818, 1.18921, 1.5874, 1.05946,
1.41421, 1.88775, 1.25992, 1.68179, 1.12246, 1.49831, 1.}

```
for establishing all intervals from the Minor 2 nd interval
```

In[ ]:=
```
minor2nd = N[2^(1/12)]
```

Out[ ]= 1.05946

In[ ]:=
```
m2toall12 = Table[minor2nd^n, {n, 0, 12}]
```

Out[ ]= {1., 1.05946, 1.12246, 1.18921, 1.25992, 1.33484,
1.41421, 1.49831, 1.5874, 1.68179, 1.7818, 1.88775, 2.}

```
for establishing all intervals from the major7th interval
```

In[ ]:=
```
major7 = N[2^(11/12)]
```

Out[ ]= 1.88775

In[ ]:=
```
M7toall12 = Table[major7^n, {n, 0, 12}]
```

Out[ ]= {1., 1.88775, 3.56359, 6.72717, 12.6992, 23.9729,
45.2548, 85.4298, 161.27, 304.437, 574.701, 1084.89, 2048.}

In[ ]:=
```
N[2^FractionalPart[Log[2, M7toall12]]]
```

Out[ ]= {1., 1.88775, 1.7818, 1.68179, 1.5874, 1.49831,
1.41421, 1.33484, 1.25992, 1.18921, 1.12246, 1.05946, 1.}