

```
In[*]:=  $\Phi_{em,d} := \Phi_{em,d} = \mathcal{O}_{AR,\{x,y\},\{1\}} [\mathcal{A}_0[AWExp_d[L[\varphi[d]]] /. aw\_AW \Rightarrow AW_1 @@ (aw /. \{1 \rightarrow x, 2 \rightarrow y\})]]$ 
```

```
In[*]:=  $F[0] = 1; F[1] = 1; F[n_] := F[n - 1] + F[n - 2]$ 
```

```
In[*]:= Table[F[n], {n, 0, 10}]
```

```
Out[*]=
```

```
{1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89}
```

```
In[*]:= Table[F[n], {n, 0, 20}]
```

```
Out[*]=
```

```
{1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144, 233, 377, 610, 987, 1597, 2584, 4181, 6765, 10946}
```

```
In[*]:= Timing@Table[F[n], {n, 0, 30}]
```

```
Out[*]=
```

```
{10.2813, {1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144, 233, 377, 610, 987, 1597, 2584, 4181, 6765, 10946, 17711, 28657, 46368, 75025, 121393, 196418, 317811, 514229, 832040, 1346269}}
```

```
In[*]:=  $G[0] = 1; G[1] = 1; G[n_] := (G[n] = G[n - 1] + G[n - 2])$ 
```

```
In[*]:= Timing@Table[G[n], {n, 0, 30}]
```

```
Out[*]=
```

```
{0., {1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144, 233, 377, 610, 987, 1597, 2584, 4181, 6765, 10946, 17711, 28657, 46368, 75025, 121393, 196418, 317811, 514229, 832040, 1346269}}
```

```
In[*]:= Timing@Table[G[n], {n, 0, 100}]
```

```
Out[*]=
```

```
{0., {1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144, 233, 377, 610, 987, 1597, 2584, 4181, 6765, 10946, 17711, 28657, 46368, 75025, 121393, 196418, 317811, 514229, 832040, 1346269, 2178309, 3524578, 5702887, 9227465, 14930352, 24157817, 39088169, 63245986, 102334155, 165580141, 267914296, 433494437, 701408733, 1134903170, 1836311903, 2971215073, 4807526976, 7778742049, 12586269025, 20365011074, 32951280099, 53316291173, 86267571272, 139583862445, 225851433717, 365435296162, 591286729879, 956722026041, 1548008755920, 2504730781961, 4052739537881, 6557470319842, 10610209857723, 17167680177565, 27777890035288, 44945570212853, 72723460248141, 117669030460994, 190392490709135, 308061521170129, 498454011879264, 806515533049393, 1304969544928657, 2111485077978050, 3416454622906707, 5527939700884757, 8944394323791464, 14472334024676221, 23416728348467685, 37889062373143906, 61305790721611591, 99194853094755497, 160500643816367088, 259695496911122585, 420196140727489673, 679891637638612258, 1100087778366101931, 1779979416004714189, 2880067194370816120, 4660046610375530309, 7540113804746346429, 12200160415121876738, 19740274219868223167, 3194043463499009905, 51680708854858323072, 83621143489848422977, 135301852344706746049, 218922995834555169026, 354224848179261915075, 573147844013817084101}}
```

In[\*]:= ? F

Out[\*]=

Symbol
Global`F
Definitions
$F[0] = 1$
$F[1] = 1$
$F[n_] := F[n - 1] + F[n - 2]$
Full Name Global`F
^

In[\*]:= ? G

Out[\*]=

Symbol
Global`G
Definitions
$G[27] = 317811$
$G[42] = 433494437$
$G[28] = 514229$
$G[39] = 102334155$
$G[43] = 701408733$
$G[98] = 218922995834555169026$
$G[92] = 12200160415121876738$
$G[16] = 1597$
$G[44] = 1134903170$
$G[51] = 32951280099$
$G[79] = 23416728348467685$
$G[9] = 55$
$G[1] = 1$
$G[94] = 31940434634990099905$
$G[54] = 139583862445$

G[52] = 53 316 291 173  
G[87] = 1 100 087 778 366 101 931  
G[61] = 4 052 739 537 881  
G[76] = 5 527 939 700 884 757  
G[11] = 144  
G[60] = 2 504 730 781 961  
G[84] = 259 695 496 911 122 585  
G[23] = 46 368  
G[66] = 44 945 570 212 853  
G[88] = 1 779 979 416 004 714 189  
G[100] = 573 147 844 013 817 084 101  
G[33] = 5 702 887  
G[2] = 2  
G[49] = 12 586 269 025  
G[30] = 1 346 269  
G[29] = 832 040  
G[12] = 233  
G[69] = 190 392 490 709 135  
G[25] = 121 393  
G[72] = 806 515 533 049 393  
G[8] = 34  
G[67] = 72 723 460 248 141  
G[70] = 308 061 521 170 129  
G[58] = 956 722 026 041  
G[35] = 14 930 352  
G[26] = 196 418  
G[38] = 63 215 086

$G[30] = 95245980$   
 $G[21] = 17711$   
 $G[41] = 267914296$   
 $G[10] = 89$   
 $G[20] = 10946$   
 $G[50] = 20365011074$   
 $G[53] = 86267571272$   
 $G[78] = 14472334024676221$   
 $G[31] = 2178309$   
 $G[36] = 24157817$   
 $G[15] = 987$   
 $G[59] = 1548008755920$   
 $G[62] = 6557470319842$   
 $G[89] = 2880067194370816120$   
 $G[74] = 2111485077978050$   
 $G[5] = 8$   
 $G[83] = 160500643816367088$   
 $G[17] = 2584$   
 $G[80] = 37889062373143906$   
 $G[0] = 1$   
 $G[14] = 610$   
 $G[19] = 6765$   
 $G[7] = 21$   
 $G[18] = 4181$   
 $G[34] = 9227465$   
 $G[97] = 135301852344706746049$   
 $G[13] = 377$

$$G[55] = 225\,851\,433\,717$$

$$G[6] = 13$$

$$G[40] = 165\,580\,141$$

$$G[73] = 1\,304\,969\,544\,928\,657$$

$$G[99] = 354\,224\,848\,179\,261\,915\,075$$

$$G[68] = 117\,669\,030\,460\,994$$

$$G[47] = 4\,807\,526\,976$$

$$G[82] = 99\,194\,853\,094\,755\,497$$

$$G[37] = 39\,088\,169$$

$$G[57] = 591\,286\,729\,879$$

$$G[86] = 679\,891\,637\,638\,612\,258$$

$$G[77] = 8\,944\,394\,323\,791\,464$$

$$G[32] = 3\,524\,578$$

$$G[3] = 3$$

$$G[95] = 51\,680\,708\,854\,858\,323\,072$$

$$G[64] = 17\,167\,680\,177\,565$$

$$G[93] = 19\,740\,274\,219\,868\,223\,167$$

$$G[96] = 83\,621\,143\,489\,848\,422\,977$$

$$G[45] = 1\,836\,311\,903$$

$$G[90] = 4\,660\,046\,610\,375\,530\,309$$

$$G[4] = 5$$

$$G[85] = 420\,196\,140\,727\,489\,673$$

$$G[71] = 498\,454\,011\,879\,264$$

$$G[91] = 7\,540\,113\,804\,746\,346\,429$$

$$G[22] = 28\,657$$

$$G[24] = 75\,025$$

$$G[48] = 7\,778\,742\,049$$

```

G[65] = 27 777 890 035 288

G[63] = 10 610 209 857 723

G[46] = 2 971 215 073

G[81] = 61 305 790 721 611 591

G[56] = 3 65 435 296 162

G[75] = 3 416 454 622 906 707

G[n_] := G[n] = G[n - 1] + G[n - 2]

Full Name Global`G

```

In[ ]:= **a = Date[]**

Out[ ]= {2023, 11, 9, 17, 38, 5.4626926}

In[ ]:= **a**

Out[ ]= {2023, 11, 9, 17, 38, 5.4626926}

In[ ]:= **a**

Out[ ]= {2023, 11, 9, 17, 38, 5.4626926}

In[ ]:= **b := Date[]**

In[ ]:= **b**

Out[ ]= {2023, 11, 9, 17, 38, 30.9860830}

In[ ]:= **b**

Out[ ]= {2023, 11, 9, 17, 38, 32.9065783}