

Pensieve Header: See also 2009-01/Very Large Numbers.

```
In[51]:= Step[{n_}] := n;
Step[{n_, 1}] := {n+2};
Step[{n_, 1, 1, rest___}] := {n+2, 1, rest};
Step[{n_, 1, 2, 1, rest___}] := {2n+2, 1, rest};
Step[{n_, rest__}] /; FreeQ[Rest[{rest}], 1] := (
  k = Last[{rest}] - 1;
  {k} = Last[Position[{rest}, k, 1]];
  Flatten[{
    2,
    Take[{rest}, k-1],
    Table[Take[{rest}, {k, -2}], {n}]
  ]
);
Step[{n_, rest__}] /; MemberQ[Rest[{rest}], 1] := (
  {1} = Last[Position[{rest}, 1, 1, 2]];
  k = {rest}[[1-1]] - 1;
  {k} = Last[Position[Take[{rest}, 1-2], k, 1]];
  Flatten[{
    2,
    Take[{rest}, k-1],
    Table[Take[{rest}, {k, 1-2}], {n}],
    Drop[{rest}, 1-1]
  ]
);

In[105]:= s = {4, 1, 2, 2};
steps = 0;
While[Head[s] === List && ++steps < 500 && Length[s] < 1000, Print[s = Step[s]];
s
{2, 1, 2, 1, 2, 1, 2, 1, 2}
{2, 1, 1, 1, 2, 1, 2, 1, 2}
{4, 1, 1, 2, 1, 2, 1, 2}
{6, 1, 2, 1, 2, 1, 2}
{2, 1, 1, 1, 1, 1, 1, 1, 2, 1, 2}
{4, 1, 1, 1, 1, 1, 1, 2, 1, 2}
{6, 1, 1, 1, 1, 1, 2, 1, 2}
{8, 1, 1, 1, 1, 2, 1, 2}
{10, 1, 1, 1, 2, 1, 2}
{12, 1, 1, 2, 1, 2}
{14, 1, 2, 1, 2}
{2, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 2}
{4, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 2}
{6, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 2}
```



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{48, 1, 1, 1, 1, 1, 1, 1, 1}
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{50, 1, 1, 1, 1, 1, 1, 1}
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{52, 1, 1, 1, 1, 1}
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{54, 1, 1, 1, 1}
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{56, 1, 1, 1}
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{58, 1, 1}
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{60, 1}
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{62}
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62
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Out[108]= 62
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