

The sequence and  $S$  matrix is made as follows,

```
> Srow:= Vector(n, datatype = integer):
A:= Vector(n, datatype = integer):
for i from 1 to n do
  A[i]:= irem( (i^2),n);          # integer remainder
  Srow[A[i]+1]:= 1;
end do:
S:= Matrix(n, n):
SL:= convert(Srow, list):        # make list to rotate
for i from 1 to n do
  for j from 1 to n do
    S[i,j]:= SL[j];
  end do;
SL:= Rotate(SL, 1):             # rotate 1 element
end do:
```

The result is the  $S$  matrix. This can be inverted in Maple as  $S^{(-1)}$  but for the particular form of this matrix, inversion can be obtained more quickly using

$$S^{-1} = \frac{2}{n+1} (2S^T - J_n)$$

where the superscript  $T$  means transpose and  $J_n$  is an  $n \times n$  matrix where each element is 1 (Harwit & Sloane 1979).