A1Q7

Suppose you are given a Maple list R of numbers which are the roots of a polynomial $f(x)$. Write a Maple for loop that constructs the polynomial. For example, if R = [1, 3, 5, 11, 12] then the value of f should be the polynomial $(x-1)(x-3)(x-5)(x-11)(x-12)$.

Now suppose you are given a Maple list C of numbers which are the coefficient of a polynomial $g(x)$. Write a Maple for loop that constructs the polynomials. For example, if C = [1, 4, 0, 5, 2] then the value of g should be $1 + 4 \cdot x + 5 \cdot x^3 + 2 \cdot x^4$.

```
> restart:
> R := [1,3,5,11,12];
```

$$R := [1, 3, 5, 11, 12] \quad \textbf{(1)}$$

```
> for i from 1 to nops(R) do
      if i = 1 then
          f := x - R[i];
      else
          f := f * (x - R[i]);
      fi;
  od;
  f;
```

$$(x-1)\,(x-3)\,(x-5)\,(x-11)\,(x-12) \quad \textbf{(2)}$$

```
> C := [1,4,0,5,2];
```

$$C := [1, 4, 0, 5, 2] \quad \textbf{(3)}$$

```
> for i to nops(C) do
      if i=1 then
          g := 1
      else
          g := g + C[i]*x^(i-1);
      fi;
  od;
  g;
```

$$2x^4 + 5x^3 + 4x + 1 \quad \textbf{(4)}$$