Lists of numbers (details)

- Union of a sequence $\mathtt{s} : \mathit{num} \to V$

  $\mathsf{UnionSeq}\ \mathtt{s} = \bigcup(\mathsf{Image}(\mathtt{s} \circ \mathsf{Num2num})\mathsf{Num})$

- $\bigcup_{\mathtt{n}} t[\mathtt{n}]$ abbreviates $\mathsf{UnionSeq}(\lambda\mathtt{n}.\,t[\mathtt{n}])$

- $\mathsf{List}\ \mathtt{X}$ is the set of n-tuples $\langle x_1, \ldots, x_n \rangle$

  $$\mathsf{List}\ \mathtt{X} = \bigcup_{\mathtt{n}} \mathsf{FiniteList}\ \mathtt{X}\ \mathtt{n}$$

  where:

  $$\mathsf{FiniteList}\ \mathtt{X}\ 0 = \{\mathsf{True}\}$$

  $$\mathsf{FiniteList}\ \mathtt{X}\ (\mathsf{Suc}\ \mathtt{n}) = \\ \mathsf{FiniteList}\ \mathtt{X}\ \mathtt{n} \cup (\mathtt{X} \times \mathsf{FiniteList}\ \mathtt{X}\ \mathtt{n})$$

- Not a type theory style construction!