1993 Paper 1 Question 10

Distinguish between `TRY-EXCEPT` and `TRY-FINALLY` and provide program fragments to illustrate uses of these Modula-3 clauses.

A Modula-3 program includes the following declarations:

```
TYPE
   ArrCard = ARRAY OF CARDINAL;
   RefArrCard = REF ArrCard;

EXCEPTION
   TooMuch;

PROCEDURE Read(VAR a: RefArrCard) : CARDINAL =
      .
      .
   END Read;

VAR
   buffer:= NEW(RefArrCard, 10);
   count:= Read(buffer);
```

The data for the program are arranged in lines with strictly one `CARDINAL` value on each line so that a loop incorporating `Scan.Int(Rd.GetLine(Stdio.stdin))` will input successive values.

As indicated, the variable `buffer` initially refers to an array of 10 `CARDINAL`s and this is handed to the procedure `Read` whose task is to read values from the data and assign them to successive elements of the array.

Should there be more values in the data than can be accommodated in the array, the procedure `Read` will raise the `TooMuch` exception. The exception handler will create a new array which is larger by 20%, transfer values from the full array to the new one, and then continue reading from the data. This enlargement process will be repeated as necessary until all the data have been read. It may be assumed that there is unlimited memory.

When the reading is complete, `buffer` will refer to the most recently created array and the procedure `read` will return, for assignment to the variable `count`, the number of values that have been read from the data.

Complete the procedure `Read`.