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/*Peter Braband #3418868 */
/* Lab 6 */
/* Part A */
CREATE OR REPLACE FUNCTION compute_mean_books
RETURN NUMBER IS
   b_id book_loans.book_id%type;
   card_no book_loans.card_no%type;
   my_sum NUMERIC := 0.0;
   CURSOR my_cursor IS
      SELECT COUNT(book_id), card_no
      FROM book_loans
      GROUP BY card_no;
BEGIN
   OPEN my_cursor;
   LOOP
      FETCH my_cursor INTO b_id, card_no;
      EXIT WHEN my_cursor%NOTFOUND;
      my_sum := my_sum + b_id;
   END LOOP;
   my_sum := my_sum / my_cursor%ROWCOUNT;
   CLOSE my_cursor;
   RETURN my_sum;
END;
/
/* Part B */
CREATE OR REPLACE FUNCTION compute_sd_books
RETURN NUMBER IS
   my_mean NUMERIC:= 0.0;
   my_n INTEGER := 0;
   b_id book_loans.book_id%type;
   card_no book_loans.card_no%type;
   my_running_val NUMERIC := 0.0;
   my_sd NUMERIC := 0.0;
   CURSOR my_cursor IS
      SELECT COUNT(book_id), card_no
      FROM book_loans
      GROUP BY card_no;
BEGIN
   OPEN my_cursor;
   my_mean := compute_mean_books();
   LOOP
      FETCH my_cursor INTO b_id, card_no;
      EXIT WHEN my_cursor%NOTFOUND;
      my_n := my_n + 1;
      my_running_val := my_running_val + POWER(b_id - my_mean, 2);
   END LOOP;
   my_sd := SQRT(my_running_val / (my_n -1));
   CLOSE my_cursor;
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   RETURN my_sd;
END;
/
CREATE TYPE numsarray IS VARRAY(2) OF NUMERIC;
/
/* Part C */
CREATE OR REPLACE PROCEDURE
mean_and_sd(nums OUT numsarray)
IS
   my_sd NUMERIC := 0;
   my_mean NUMERIC := 0;
   nums numsarray := numsarray();
BEGIN
   my_sd := compute_sd_books();
   my_mean := compute_mean_books();
   nums := nums(my_mean, my_sd);
END;

/* Part D */
DECLARE
   nums numsarray := numsarray();
BEGIN
   nums := mean_and_sd();
   dbms_output.put_line('Mean: ' || nums(0));
   dbms_output.put_line('SD: ' || nums(1));
END;
```