**Pseudo-code**

BEGIN manage\_grades

DECLARE grades as empty list

DECLARE student\_count as 10

// Prompt for grade input

PRINT "Please enter the midterm exam grades for each student (out of 30):"

FOR i FROM 1 TO student\_count

DO

PRINT "Enter grade for student ", i, ": "

INPUT grade

// Validation: Check for non-numeric input and range

WHILE NOT is\_numeric(grade) OR grade < 0 OR grade > 30

PRINT "Invalid input. Please enter a numeric grade between 0 and 30."

INPUT grade

END WHILE

APPEND grade TO grades

LOOP

// Convert grades list to array for calculations

DECLARE grades\_array as array from grades

// Statistical calculations

DECLARE min\_grade as minimum of grades\_array

DECLARE max\_grade as maximum of grades\_array

DECLARE range\_of\_grades as max\_grade - min\_grade

DECLARE average\_grade as average of grades\_array

DECLARE std\_deviation as standard deviation of grades\_array

// Display results

PRINT "Results:"

PRINT "Minimum Grade: ", min\_grade

PRINT "Maximum Grade: ", max\_grade

PRINT "Range of Grades: ", range\_of\_grades

PRINT "Average Grade: ", average\_grade

PRINT "Standard Deviation: ", std\_deviation

END manage\_grades

**Python code**

import numpy as np

def manage\_grades():

# Initialize a list to store grades

grades = []

# Input grades for 10 students

print("Please enter the midterm exam grades for 10 students (out of 30):")

for i in range(10):

while True:

try:

grade = float(input(f"Grade for student {i+1}: "))

if 0 <= grade <= 30:

grades.append(grade)

break

else:

print("Invalid grade. It must be between 0 and 30.")

except ValueError:

print("Invalid input. Please enter a number.")

# Convert grades list to a NumPy array for easier calculations

grades\_array = np.array(grades)

# Calculating minimum and maximum grades

min\_grade = np.min(grades\_array)

max\_grade = np.max(grades\_array)

# Calculating the range of grades

range\_of\_grades = max\_grade - min\_grade

# Calculating the average grade

average\_grade = np.mean(grades\_array)

# Calculating the standard deviation of grades

std\_deviation = np.std(grades\_array)

# Display the results

print("\nResults:")

print(f"Minimum Grade: {min\_grade}")

print(f"Maximum Grade: {max\_grade}")

print(f"Range of Grades: {range\_of\_grades}")

print(f"Average Grade: {average\_grade:.2f}")

print(f"Standard Deviation of Grades: {std\_deviation:.2f}")

# Run the program

manage\_grades()