

Labs

Lab 3.1: Prime Numbers

What is the purpose?

In this lab exercise, you will rewrite Listing 4.14, PrimeNumber.java, on pages 125-126 of your textbook.

Your program must meet the following requirements:

1. Declare a method to determine whether an integer is a prime number. Use the following method header:

```
public static Boolean isPrime(int num)
```

An integer greater than 1 is a prime number if its only divisor is 1 or itself. For example, isPrime(11) returns true, and isPrime(9) returns false.

2. Use the isPrime method to find the first 1,000 prime numbers and display every 10 prime numbers in a row.

What are the steps?

- Task 1:

Procedure

1. Study the sample program on page 117 of your textbook.
2. Declare a method called isPrime(int).
3. Use a for loop to determine if a number (besides 1) is prime or not.
4. Add another for loop to print out a row of 10 prime numbers for the first 1000 prime numbers.
5. Compile the java file using the javac command.
6. Execute the java class using the java command.
7. Save a screen shot of the output and submit it to your instructor. It should look similar to Figure 3-1-1.

```

F:\IT-218 Java Programming I\Class Activities\week3>java Exercise5_16
2 3 5 7 11 13 17 19 23 29
31 37 41 43 47 53 59 61 67 71
73 79 83 89 97 101 103 107 109 113
127 131 137 139 149 151 157 163 167 173
179 181 191 193 197 199 211 223 227 229
233 239 241 251 257 263 269 271 277 281
283 293 307 311 313 317 331 337 347 349
353 359 367 373 379 383 389 397 401 409
419 421 431 433 439 443 449 457 461 463
467 479 487 491 499 503 509 521 523 541
547 557 563 569 571 577 587 593 599 601
607 613 617 619 631 641 643 647 653 659
661 673 677 683 691 701 709 719 727 733
739 743 751 757 761 769 773 787 797 809
811 821 823 827 829 839 853 857 859 863
877 881 883 887 907 911 919 929 937 941
947 953 967 971 977 983 991 997 1009 1013
1019 1021 1031 1033 1039 1049 1051 1061 1063 1069
1087 1091 1093 1097 1103 1109 1117 1123 1129 1151
1153 1163 1171 1181 1187 1193 1201 1213 1217 1223
1229 1231 1237 1249 1259 1277 1279 1283 1289 1291
1297 1301 1303 1307 1319 1321 1327 1361 1367 1373
1381 1399 1409 1423 1427 1429 1433 1439 1447 1451

```

Figure 3-1-1

Did it work?

- Were you able to display the first 1000 prime numbers in the console?
- Were you able to display every 10 prime numbers in a row in the console?

Lab 3.2: Analyzing Scores**What is the purpose?**

In this lab, you will write a program that reads an unspecified number of scores by an input dialog box and determines how many scores are above or equal to the average and how many scores are below the average. Enter a negative number to signify the end of the input. Assume that the maximum number of scores is 100. Display the output in the console.

What are the steps?

- Task 1:

Procedure

1. Create a Java class and name the java file with .java extension.
2. Import the javax.swing.JOptionPane package to create dialog boxes.
3. Declare a double array to capture all the input scores.
4. Declare a double variable to store the summation of all scores.
5. Create a do-while loop to process all the scores and the summation.
6. Declare an integer variable to count the total number of scores.
7. Declare a double variable to compute the average of all scores.
8. Declare an integer variable to count the number of scores above the average.

9. Declare an integer variable to count the number of scores below the average.
10. Create a for loop to compute scores' average, the number of scores above the average, and the number of scores below the average.
11. Compile the java file using the javac command.
12. Execute the java class using the java command.
13. Save screen shots of the output similar to Figures 3-2-1 through 3-2-6 and submit to them to your instructor.

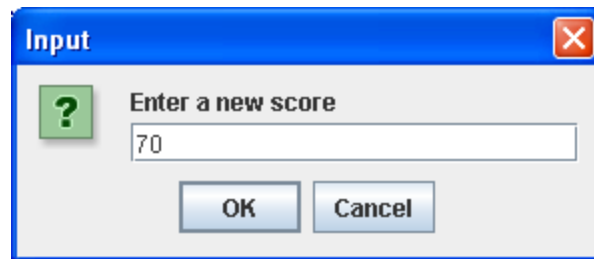


Figure 3-2-1: Sample Output 1

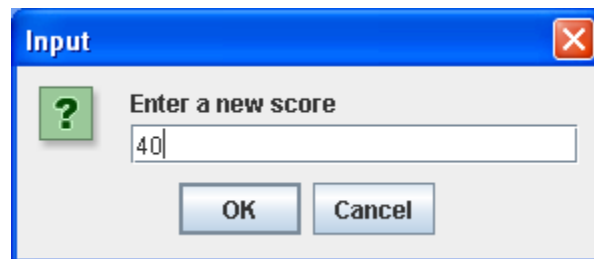


Figure 3-2-2: Sample Output 2

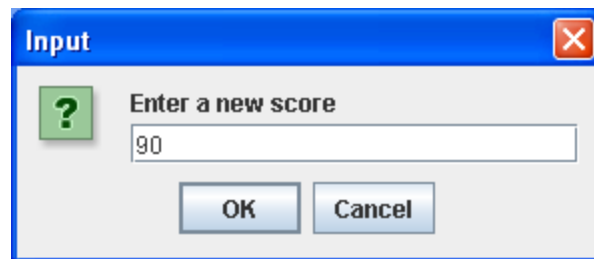


Figure 3-2-3: Sample Output 3

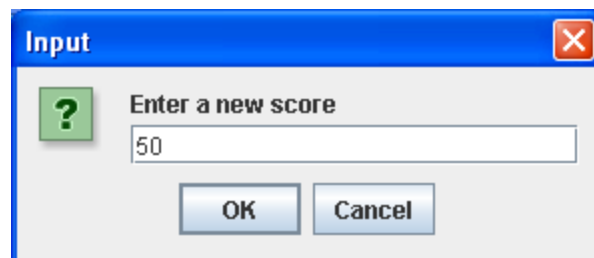


Figure 3-2-4: Sample Output 4

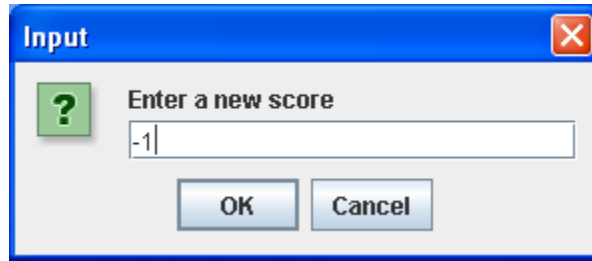


Figure 3-2-5: Sample Output 5

Average is 62.25
The number of scores above or equal to the average 2
The number of scores below the average 2

Figure 3-2-6: Console Output

Did it work?

Were you able to—

- Capture undefined number of scores and display the average score?
- Display the number of scores are above the average score?
- Display the number of scores are below the average score?