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1  #While Loops Challenge 28: Prime Number App
2  import time
3
4  print("Welcome to the Prime Number App")
5
6  running = True
7
8  #Run the program as long as the user wants
9  while running:
10     #Get user input
11     print("\nEnter 1 to determine if a specific number is prime.")
12     print("Enter 2 to determine all prime numbers within a set range.")
13     option = input("Enter your choice 1 or 2: ")
14
15     #Determine if a single number is prime
16     if option == '1':
17         number = int(input("\nEnter a number to determine if it is prime or not:
18         "))
19
20         #Prime status check
21         prime_status = True
22         for i in range(2, number):
23             if number % i == 0:
24                 prime_status = False
25                 break
26
27         #Print summary
28         if prime_status:
29             print(str(number) + " is prime!")
30         else:
31             print(str(number) + " is not prime!")
32
33     #Determine primes within a range of values and time the calculations
34     elif option == '2':
35         l_bound = int(input("\nEnter the lower bound of your range: "))
36         u_bound = int(input("Enter the upper bound of your range: "))
37
38         primes = []
39
40         #Get the current time
41         start_time = time.time()
42
43         #Check prime status of all numbers within l_bound and u_bound
44         for prime_candidate in range(l_bound, u_bound + 1):
45             #1 is not prime
46             if prime_candidate > 1:
47                 prime_status = True
48                 for i in range(2, prime_candidate):
49                     if prime_candidate % i == 0:
50                         prime_status = False
51                         break
52             else:
53                 prime_status = False
54             #Prime candidate is in fact prime!
55             if prime_status:
56                 primes.append(prime_candidate)
57
58         #Get the current time
59         end_time = time.time()
60
61         #Determine the time the calculations took
62         delta_time = round(end_time - start_time, 4)
63
64         print("\nCalculations took a total of " + str(delta_time) + " seconds.")

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64         print("The following numbers between " + str(l_bound) + " and " +  
str(u_bound) + " are prime: ")  
65         input("Press enter to continue.")  
66  
67         for prime in primes:  
68             print(prime)  
69  
70         #Not a valid choice entered by the user  
71         else:  
72             print("\nThat is not a valid option.")  
73  
74         #Quit the program if the user does not enter in y  
75         choice = input("Would you like to run the program again (y/n): ").lower()  
76         if choice != 'y':  
77             running = False  
78             print("\nThank you for using the program. Have a nice day.")
```