Code Debugging

Given code for two programming challenges, find the mistakes that prevent it from working!

Key programming concepts: Common programming mistakes
Approximate lines of code: The code is already written!

Assignment Details:

For this homework you must fix the code provided, NOT write your own code! For each error/typo/bug that you find, add a comment explaining what you fixed (the comments can be short and simple). You will turn in the fixes and corresponding comments as your homework solution to Canvas. Here are a few guidelines to follow:

- You can not simply rewrite the code yourself
- Avoid deleting chunks of code; the code does work except for the typos/mistakes
- Avoid adding several lines of new code; the main functionality is already written
- Each line may have a typo, logic mistake, missing code piece, may be in the wrong location, etc...
- Leave a comment with a short explanation of the error near the line the mistake was found

Challenge A. Print all prime factors of a positive whole number from the user (`https://www.mathsisfun.com/prime-factorization.html`)

Program Inputs

- **Enter a positive whole number N:**
  - *The user will always enter a positive number greater than 1, no error checking needed!*

Program Outputs

- **Prime factors: XXX YYY ZZZ....**
  - *Replace XXX, YYY, ZZZ with the prime factors in ascending order.*

Solution Process

- Ask the user for N
- Starting with the prime factor 2, repeatedly try dividing different factors int N
  - If the current factor evenly divides into N, list it and reduce N by dividing by this factor
  - If the current factor does not evenly divide, try the next whole number
  - Repeat until N reduces to 1 or less

Test Case 1:
```
Enter a positive, whole number N: 12
Prime factors: 2 2 3
```

Test Case 2:
```
Enter a positive, whole number n: 315
Prime factors: 3 3 5 7
```

Test Case 3:
```
Enter a positive, whole number n: 360
Prime factors: 2 2 2 3 3 5
```

Test Case 4:
```
Enter a positive, whole number n: 147
Prime factors: 3 7 7
```

Test Case 5:
```
Enter a positive whole number N: 151
Prime factors: 151
```

Challenge B. Given a positive integer N, find the lowest multiple of N made up of only 9's and 0's!

Program Inputs

- **Enter a positive whole number N:**
  - *The user will always follow instructions, no error checking needed!*

Program Outputs

- **Lowest multiple with only 9s and 0s: XXX.**
  - *Replace XXX with the lowest multiple found.*

Solution Process

- Ask the user for N
- Repeatedly create a multiple of N and test if all digits are 9 or 0:
  - Create the next multiple of N, called M
  - Repeatedly divide M by 10 to check each digit:
    - Check the remainder when dividing M by 10
    - If the remainder is 9 or 0, reduce M by a factor of 10 (ignore any decimals)
    - If the remainder was another number, try the next multiple of N

Test Case 1:
```
Enter a positive whole number N: 5
Lowest multiple with only 9s and 0s: 90
```

Test Case 2:
```
Enter a positive whole number N: 6
Lowest multiple with only 9s and 0s: 90
```

Test Case 3:
```
Enter a positive whole number N: 7
Lowest multiple with only 9s and 0s: 9009
```

Test Case 4:
```
Enter a positive whole number N: 432
Lowest multiple with only 9s and 0s: 9990000
```

Test Case 5:
```
Enter a positive whole number N: 511
Lowest multiple with only 9s and 0s: 90099009
```