def prime\_factors(num):

prime\_factors\_dict = {}

divisor = 2

while num > 1:

if num % divisor == 0:

if divisor not in prime\_factors\_dict:

prime\_factors\_dict[divisor] = 1

else:

prime\_factors\_dict[divisor] += 1

num //= divisor

else:

divisor += 1

return prime\_factors\_dict

def print\_prime\_factors(num):

prime\_factors\_dict = prime\_factors(num)

print(f"The prime factors decomposition of {num} is:")

remaining\_num = num

for prime, power in prime\_factors\_dict.items():

print(f"{remaining\_num} | {prime}")

remaining\_num //= (prime \*\* power)

print(f"{remaining\_num} | {'' if remaining\_num == 1 else ' ' + str(prime \*\* power)}")

print(f"\nTherefore, {num} =", " \* ".join([f"{prime}^{power}" for prime, power in prime\_factors\_dict.items()]))

number = int(input())

if 50 <= number <= 200:

print\_prime\_factors(number)

else:

print("Input number must be between 50 and 200.")