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Exercise 2

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Exercise 2

6 points possible (graded)

ESTIMATED TIME TO COMPLETE: 12 minutes

For the following programs, fill in the best-case and the worst-case number of steps it will take to run each program.

For these questions, you'll be asked to write a mathematical expression. Use +, -, / signs to indicate addition, subtraction, and division. Explicitly indicate multiplication with a * (ie say "6*n" rather than "6n"). Indicate exponentiation with a caret (^) (ie "n^4" for n^4). Indicate base-2 logarithms with the word log2 followed by parenthesis (ie "log2(n)").

1. Program 1:


```
def program1(x):  
    total = 0  
    for i in range(1000):  
        total += i  
  
    while x > 0:  
        x -= 1  
        total += x  
  
    return total
```

What is the number of steps it will take to run Program 1 in the best case? Express your answer in terms of n , the size of the input


 .

▼ **Week 6:**
Algorithmic
Complexity


11.
Computational
Complexity

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12. Searching and
Sorting Algorithms

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Problem Set 6

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What is the number of steps it will take to run Program 1 in the worst case? Express your answer in terms of n , the size of the input .

2. Program 2:

```
def program2(x):
    total = 0
    for i in range(1000):
        total = i

    while x > 0:
        x = x//2
        total += x

    return total
```

What is the number of steps it will take to run Program 2 in the best case? Express your answer in terms of n , the size of the input .

What is the number of steps it will take to run Program 2 in the worst case? Express your answer in terms of n , the size of the input .

3. Program 3:

```
def program3(L):  
    totalSum = 0  
    highestFound = None  
    for x in L:  
        totalSum += x  
  
    for x in L:  
        if highestFound == None:  
            highestFound = x  
        elif x > highestFound:  
            highestFound = x  
  
    return (totalSum, highestFound)
```

What is the number of steps it will take to run Program 3 in the best case? Express your answer in terms of n , the number of elements in the list `L`.

What is the number of steps it will take to run Program 3 in the worst case? Express your answer in terms of n , the number of elements in the list `L`.

Reminder: You do not lose points for trying a problem multiple times, nor do you lose points if you hit "Show Answer". If this problem has you stumped after you've tried it a few times, feel free to reveal the solution.

Click the "Reset" button to clear your answers.

Submit

Exercise 2

Show Discussion 



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