**Trace Table Examples**

Trace tables are paper based versions of Watches. They help you see the values in variables as your program “runs”. They can help you find bugs.

**Example:**

**This is a program to find the average of all the numbers in a list**

list\_nums = [10,8,3,5,6,1,2]

sum = 0

avg =0.0

for x in range(0, 6):

sum = sum + list\_nums[x]

avg = sum / (x + 1)

print("average =", avg)

**Where does it go wrong?**

Trace table

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **List\_nums** | | | | | | | **sum** | **avg** | **x** | **output** |
| **0** | **1** | **2** | **3** | **4** | **5** | **6** |
| 10 | 8 | 3 | 5 | 6 | 1 | 2 | 0 | 0.0 | - | - |
| 10 | 8 | 3 | 5 | 6 | 1 | 2 | 10 | 0.0 | 0 | - |
| 10 | 8 | 3 | 5 | 6 | 1 | 2 | 18 | 0.0 | 1 | - |
| 10 | 8 | 3 | 5 | 6 | 1 | 2 | 21 | 0.0 | 2 | - |
| 10 | 8 | 3 | 5 | 6 | 1 | 2 | 26 | 0.0 | 3 | - |
| 10 | 8 | 3 | 5 | 6 | 1 | 2 | 32 | 0.0 | 4 | - |
| 10 | 8 | 3 | 5 | 6 | 1 | 2 | 33 | 5.5 | 5 | Average = 5.5 |

**Question 1:**

**What does this program do?**

remainder = 0

input\_num = input("Input a number:")

bin = ""

while (input\_num > 0):

remainder = input\_num MOD 2

input\_num = input\_num DIV 2

bin = str(remainder) + bin #this joins (concatenates) two strings!

print(bin)

**Complete the following trace table if the input is 39**

Trace table

|  |  |  |
| --- | --- | --- |
| **input** | **remainder** | **bin** |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

**Question 2:**

**What does this program do?**

nums = [6,2,8,1,9,2]

n = 0

for i in range(0, 6):

if nums[i] > n:

n = nums[i]

**Complete the following trace table for this code.**

Trace table

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **i** | **n** | **nums** | | | | | |
| **0** | **1** | **2** | **3** | **4** | **5** |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |