

NAME

DATE

PERIOD

UNIT 4 · TOPIC 4.2 · WORKSHEET

One at a Time

Match questions to plans, fill the planning table, and catch the reset.

About 30 minutes

10 questions

Cumulative through 4.2

TOPIC

4.2



DIRECTIONS

Work each puzzle in pencil. Everyone here is made up. For Java code, write exactly what prints.



THINK FIRST

Can a register total 40 prices while remembering just one number? Guess; question 8 shows how.

PART A · 2 QUESTIONS

A

What's in a data set?

1

PENCIL CHECK

Write *data set*, *data value* (one piece of a data set), *result* (calculated from data), or *question*.

Item	What is it?
The high temperature for every day in June	
June 14: 88 degrees	
June's average high: 84 degrees	
Which day in June was the hottest?	
The team scored 41 goals in all this season.	

2 MATCH-UP

The data set: each swimmer's time in the 100-meter race, for the 8 swimmers on a team, in the order they swam. Match each question to what a program must remember while it visits the times. Each letter is used once.

Question	Letter
1 How many swimmers finished in under 70 seconds?	
2 What was the fastest time?	
3 What was the team's average time?	
4 Did any swimmer finish in under 60 seconds?	
5 How many swimmers beat the time of the swimmer just before them?	
6 Which swimmer trains the most hours each week?	

- **P** the previous value, to compare with
- **Q** a true/false flag
- **R** a counter
- **S** nothing: this data set can't answer it
- **T** a running total, then a division
- **U** the best so far

PART B · 4 QUESTIONS

B Plan it before you code it

3 FACE-OFF

Tonight: a Table and a Chart argue about who shows a data set better. Fill in the blanks.

TABLE	I list every value _____, with a label for each one. Following an algorithm step by step? Use me.
CHART	Lists are fine. I turn each value into a _____ whose length shows how big it is.
TABLE	So people have to estimate the numbers when they read you.
CHART	Maybe, but a _____, like the busiest month, jumps out at a glance.
TABLE	Add a column for each thing an algorithm remembers, and I become a _____.
CHART	Fine. We both show the same _____. We just draw it differently.

4 READ THE CHART

Rosa tracks how many books she reads each month. In this chart, each # stands for one book. Her goal is **at least 5 books** a month.

```
Sep #####
Oct #####
Nov ###
Dec #####
Jan #####
```

Month	Sep	Oct	Nov	Dec	Jan
Books					

In how many months did Rosa reach her goal? _____

A THREE-STEP PLAN IN WORDS A PROGRAM COULD FOLLOW TO ANSWER THAT QUESTION

5 PLANNING TABLE

A ski town records the snowfall (in centimeters) for five days: 3, 0, 7, 7, 5. The plan: *Start **most** at day 1's snowfall and **bestDay** at 1. For each later day, if its snowfall is greater than **most**, set **most** to it and **bestDay** to that day. Report **most** and **bestDay**.* Fill in the planning table. Day 1 is done for you.

Day	Snow	Greater than most?	most after	bestDay after
1	3	(first value)	3	1
2	0			
3	7			
4	7			
5	5			

If the test were *greater than or equal to* **most**, what would the plan report for **bestDay**? _____

6 TWO TRUTHS AND A LIE

Four winter nights had these lows: -5, -2, -9, -4. The plan: Set **highest** to 0. For each low, if it is *greater than* **highest**, set **highest** to it. Report **highest**. Two claims are true and one is a lie. Circle the lie, then rewrite it so it's true.

- **1** The plan reports 0, which isn't one of the lows.
- **2** If the plan started **highest** at the first low, -5, it would report -2.
- **3** Starting **highest** at 0 is safe for any data set, because every value still gets compared with it.

THE LIE, REWRITTEN

PART C · 4 QUESTIONS

C

One value at a time, in Java



FAIR QUESTION

Do the values in a data set have to be numbers?

No. A playlist is a data set of song titles, and a week of weather can be recorded as one letter per day, like S for sunny and R for rain. What matters is that every value describes the same subject. Part C uses data sets of letters, visited one letter at a time.

7

YOU'RE THE JVM

Dev records a Y for each day he finished his homework and an N for each day he didn't. Run this code in your head. What prints?

```
1 String log = "YYNYY";
2 int done = 0;
3 for (int i = 0; i < log.length(); i++) {
4     done = 0;
5     if (log.substring(i, i + 1).equals("Y")) {
6         done++;
7     }
8 }
9 System.out.println(done);
```

A 4

B 1

C 0

D 5

8 CODE TILES

A weather log stores one letter per day: S sunny, R rain, C cloudy. Put the tiles in order so the program counts the rainy days and prints the output below. One tile is a decoy and isn't used.

```
String week = "SRRCRSRS";
```

```
System.out.println("Rainy days: " + rainy);  
}  
for (int i = 0; i < week.length(); i++) {  
    int rainy = 1;  
    if (week.substring(i, i + 1).equals("R")) { rainy++; }  
    int rainy = 0;
```

Target output

Rainy days: 3

YOUR PROGRAM**WATCH OUT**

Setup happens **once**, before the first value. Only the processing repeats. If a "start at 0" step sits inside the "for each" step, every pass wipes out the passes before it.

9 ONE-TOKEN FIX

A bus log stores L for each late day and O for each on-time day. The program prints Late days : 2, but the bus was late 3 times. Change exactly **one token** so the loop visits every value.

```
1 String bus = "LOOLLOOL";
2 int late = 0;
3 for (int i = 1; i < bus.length(); i++) {
4     if (bus.substring(i, i + 1).equals("L")) {
5         late++;
6     }
7 }
8 System.out.println("Late days: " + late);
```

YOUR FIX, AND WHICH VALUE WAS SKIPPED

10 WHO AM I?

Some ideas from this topic are playing a party game. Each gives a clue about itself. Name the idea.

Clue	I am...
I'm one piece of information in a data set, like Tuesday's step count.	
I have a row for each value and a column for each thing an algorithm remembers.	
I show each value as a bar whose length shows its size.	
I start at 0 and grow by each value as it's visited.	
I start at the first value and am replaced only when a later value beats me.	
I start out false and turn true the first time a value matches.	