

NAME

DATE

PERIOD

UNIT 4 · TOPIC 4.1 · WORKSHEET

Handle With Care

Trim the form, hide the digits, catch the bias, and question the data.

About 30 minutes

10 questions

Cumulative through 4.1

TOPIC

4.1



DIRECTIONS

Work each puzzle in pencil. Every app, school, and person here is made up. For Java code, write exactly what prints. Some puzzles include pieces you won't need.



THINK FIRST

A free trivia app wants your name, birthday, school, and home address before you can play. Which does a trivia game actually need? Guess in the margin; question 2 tests that idea.

PART A · 3 QUESTIONS

A

Guard the personal data

1 YOU'RE THE JVM

A sign-in screen confirms where a login code was sent without showing the whole email address. Run this code in your head. Write the exact output.

```
String email = "sam.ortiz@example.com";
int at = email.indexOf("@");
String shown = email.substring(0, 2) + "****" + email.substring(at);
System.out.println("Code sent to " + shown);
```

OUTPUT

2 PENCIL CHECK

StudyBuddy puts students in the same course into study groups and emails them meeting times. **RideCrew** sets up carpools to school for nearby families. Write *yes* if the app needs the field to do its job, or *no* if it doesn't.

Field on the form	StudyBuddy needs it?	RideCrew needs it?
Name		
Courses this semester		
Home address		
Birthday		
Phone's location, all day		

3 SNIPPET POOL

A pharmacy app confirms which phone gets refill texts. It should show only the **last four digits**. Fill each numbered hole with a snippet from the pool so the program prints `Texts go to *****4471`. Each snippet is used at most once, and some aren't needed.

```
String phone = "5550124471";
int keep = (1);
String shown = (2) + phone.substring((3));
System.out.println("Texts go to " + shown);
```

THE POOL

Each snippet can be used only once, and not every snippet is needed.

"*****"	keep	4
"*****"	phone.length()	phone.length() - keep
10		



FAIR QUESTION

If I store the data in a private instance variable, isn't it private?

Not in the privacy sense. `private` decides which `code` may use a variable. It doesn't stop a person from reading a screen, copying a saved file, or selling a list. Privacy is about what the program collects, shows, keeps, and shares.

PART B · 2 QUESTIONS

B

Fair for everyone?

4

FACE-OFF

Tonight: Algorithmic Bias and a Random Glitch argue about which one is worse. Fill in the blanks.

RANDOM GLITCH

When the server crashed for ten minutes, whoever happened to be online lost their work. Next time, it could be _____.

ALGORITHMIC BIAS

My errors aren't luck. I'm _____: built right into the program's rules or the data behind them.

RANDOM GLITCH

So you happen more than once?

ALGORITHMIC BIAS

Every time the situation comes up. I'm _____, and I always land on the same _____ of users.

RANDOM GLITCH

Nobody can predict me. With you, people can predict exactly _____ will be treated unfairly.

ALGORITHMIC BIAS

Don't blame only me. People wrote my rules and collected my _____.



WATCH OUT

"A computer just follows the rules, so it can't be unfair." People wrote the rules, and people collected the data. A program applies an unfair assumption to every user, faster and more consistently than any person could.

5 WHO GETS IN?

A club sign-up program checks each first name. Its programmer assumed real first names are never longer than 8 letters. Trace each call and write what it returns.

```
1 public static String check(String firstName) {
2     if (firstName.length() <= 8) {
3         return "accepted";
4     }
5     return "rejected";
6 }
```

Call	Returns
check("Maya")	
check("Oluwaseun")	
check("Ethan")	
check("Kalaniiopua")	

IS THIS ALGORITHMIC BIAS? WHO IS HARMED, AND WHY?

REWRITE LINE 2 SO EVERY NON-EMPTY NAME IS ACCEPTED

PART C · 5 QUESTIONS

C Can you trust the data?

6 PENCIL CHECK

Each data set has a problem. Write *biased collection* (the method reached some people more than others), *incomplete* (values are missing), or *inaccurate* (values are wrong).

What happened	Problem
A survey about the lunch menu is handed out only at the salad bar.	
A thermometer was unplugged for three days, so those days have no reading.	
A runner's mile time was typed as 70 minutes instead of 7.	
A poll about after-school jobs is posted only on the robotics club's page.	
Half the students skipped the "favorite subject" question.	
A store's price list still shows last year's prices.	

7 TWO TRUTHS AND A LIE

A weather station saves each day's high temperature. On day 3 its sensor glitched and saved 999. Two claims are true and one is a lie. Circle the lie, then rewrite it so it's true.

```
int total = 0;
total += 62;
total += 65;
total += 999;
total += 64;
System.out.println("Average high: " + total / 4);
```

- 1 The program prints Average high: 297.
- 2 The arithmetic in the code is correct; the wrong average comes from inaccurate data.
- 3 The program compiled and ran with no errors, so its average can be trusted.

THE LIE, REWRITTEN

8 ONE-TOKEN FIX

A step tracker saves -1 for any day its battery was dead, so the program can skip missing days. It prints Days counted: 4 and Average: 5999, but it should print Days counted: 3 and Average: 8000. Change exactly **one token** to fix it.

```
1 public class StepLog {
2     private static int total = 0;
3     private static int days = 0;
4
5     public static void record(int steps) {
6         if (steps != 0) {
7             total += steps;
8             days++;
9         }
10    }
11
12    public static void main(String[] args) {
13        record(8000);
14        record(-1);
15        record(9000);
16        record(7000);
17        System.out.println("Days counted: " + days);
18        System.out.println("Average: " + total / days);
19    }
20 }
```

YOUR FIX, AND WHY THE FIRST VERSION WAS WRONG

9 DOES IT FIT?

The cafeteria has a record of every lunch it sold last semester: the item, the price, and the date. For each question, write *yes* (this data can answer it), *no*, or *not reliably*.

Question	Fits?
Which lunch item sold the most last semester?	
Which day of the week sold the most lunches?	
How many students bring lunch from home?	
Do students like the new veggie wrap?	

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 information about one particular person, like a name, address, or location.	
I'm your ability to control who knows that information about you.	
I'm a systemic, repeated error that keeps treating the same group unfairly.	
I'm who was asked or measured, where, when, and how.	
I'm a data set with holes: some of my values are missing.	
I'm what you do when you use data to predict beyond what was measured.	