Tutorial Quiz #10 — Solutions

Using “big-Oh” notation, analyze the running time of the following code fragment, as a function of n.

```java
for (int i = n; i > n / 2; i--) {
    if (i > 50)
        sum += 2;
    else
        sum += 1;
}
```

Answer:

- The first branch of the if-statement takes time $O(1)$.
- The second branch of the if-statement takes time $O(1)$.
- The if test takes time $O(1)$.
- Hence, the time for each iteration of the loop is $O(1)$.
- The loop iterates $O(n)$ times.
- Therefore, the total time for the loop is $O(n)$.

Marking Scheme:

A. 1 mark for having “$O(1)$” for each branch of the if-statement
B. 1 mark for having “$O(1)$” for the if test
C. 1 mark for having “$O(1)$” in total for each iteration of the loop
D. 1 mark for having “$O(n)$ iterations” for the loop
E. 1 mark for multiplying the time for each iteration by the number of iterations to get the total time for the loop

Common Errors: