Computing Asymptotic Complexity

Lesson 3.2

Learning Objectives

LO 3.2.1 **Estimate** the asymptotic runtime complexity of a code snippet, function, or algorithm

Computing Code Asymptotic Complexity

- Computing asymptotic complexity can apply to computing both time and space complexity.
- For this lesson, we will focus more on time rather than on space complexity.
- Specifically, we are only interested in **time complexity of assignment and comparison statements**.

Strengthening the Learning Objectives

LO 3.2.1 Estimate the asymptotic runtime complexity of a code snippet, function, or algorithm

```
...code here...

for (i = sum = 0; i < n; i++)

   sum += a[i];

...code here...
```

LO 3.2.1 Estimate the asymptotic runtime complexity of a code snippet, function, or algorithm

```
...code here...

for (i = sum = 0; i < n; i++)
   for (j = 0; j < n; j++)
       sum += a[i][j];

...code here...
```

LO 3.2.1 Estimate the asymptotic runtime complexity of a code snippet, function, or algorithm

```
...code here...

for (i = 0; i < n; i++)

    for (j = 1, sum = a[0]; j <= i; j++)

        sum += a[j];

...code here...
```

LO 3.2.1 Estimate the asymptotic runtime complexity of a code snippet, function, or algorithm

```
...code here...

for (i = 4; i < n; i++)

    for (j = i-3, sum = a[i-4]; j <= i; j++)

        sum += a[j];

...code here...
```