

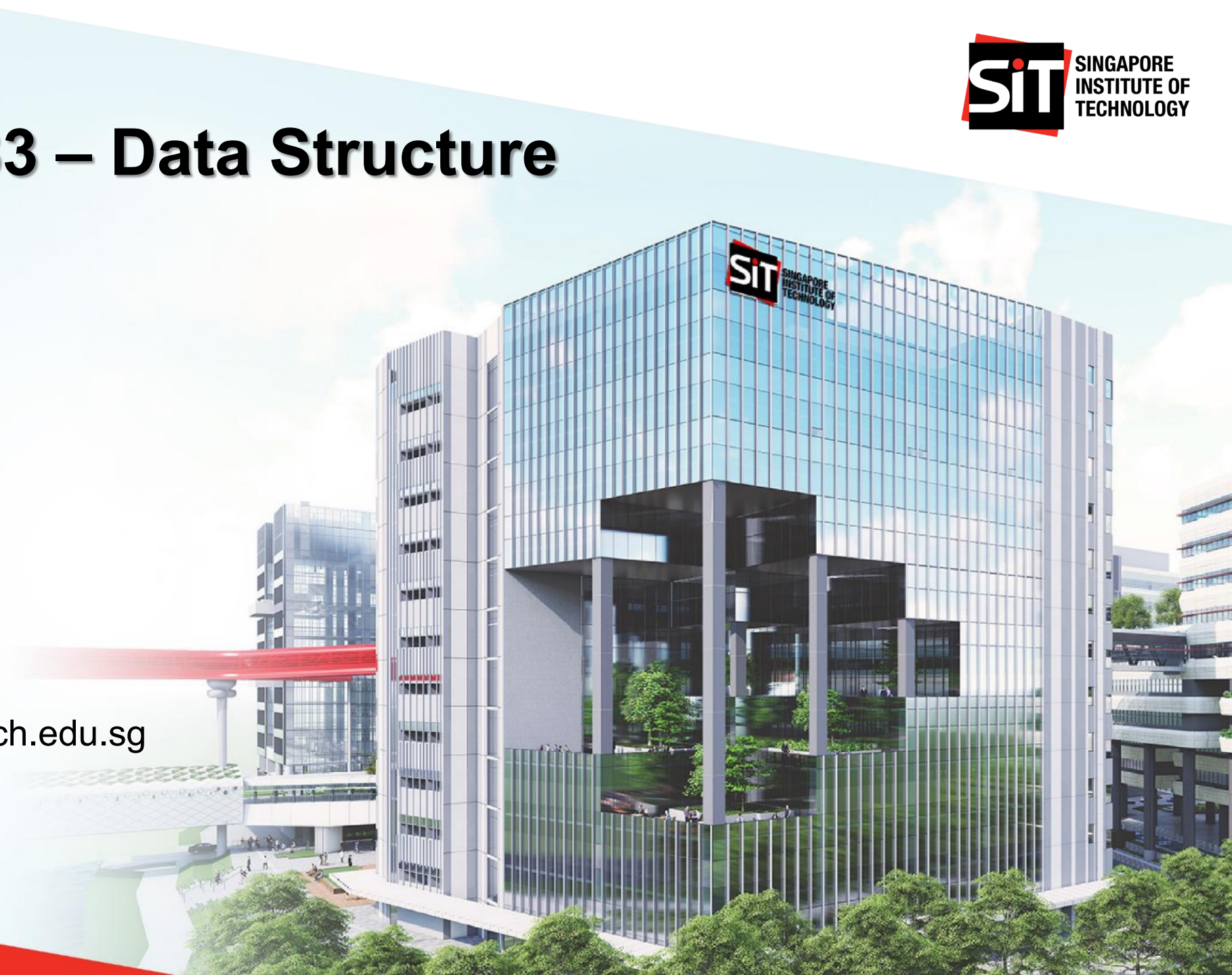
# CSD2181/2183 – Data Structure

# Exercises

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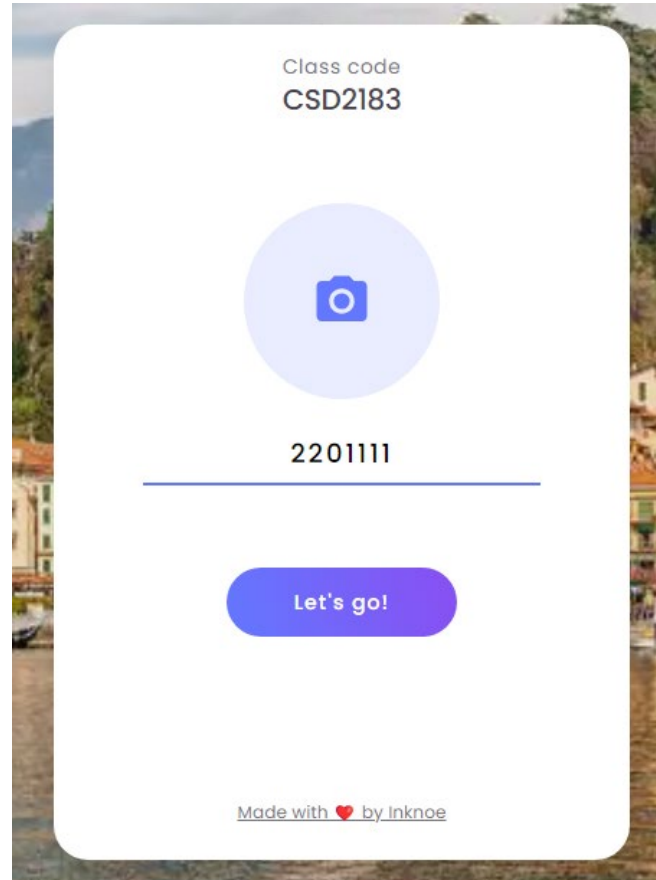
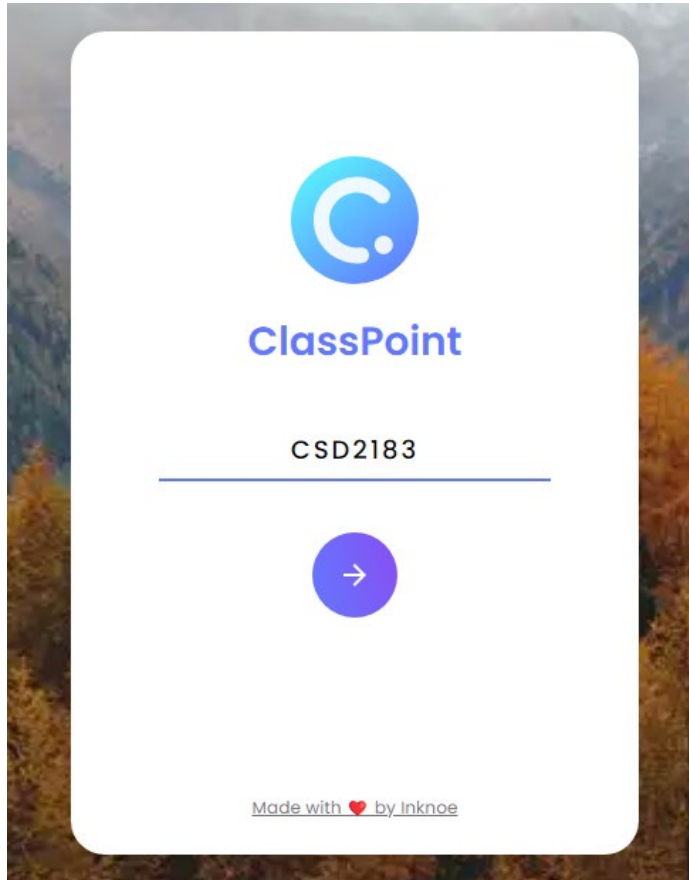


# Introduction – Data Structure Exercises

- Purpose: to reinforce what you have learned and practiced in lectures.
- The exercise session is conducted face to face in class.
- It consists of a few MCQs to be solved within class.
- Limited time is given for each question (answer will be discussed afterwards).
- You are required to login to ClassPoint with your student ID.
- So, bring along your laptop or devices with Internet access.
- Attendance is compulsory and there is no make up.
- Exercises are marked considering your overall performance in the module.

# Introduction – Data Structure Exercises

<https://www.classpoint.app/>



OR



# **Exercise 2**

## **Algorithm Analysis**

## Exercise 2 – Algorithm Analysis

### 2.1 What is the time complexity of do()?

- A.  $O(1)$
- B.  $O(\log n)$
- C.  $O(n)$
- D.  $O(n \log n)$
- E.  $O(n^2)$
- F.  $O(n^3)$

```
void op(int size){
    for (int i=0; i<size; ++i){
        int fa = 888;
    }
}

void do(){
    for (int i=0; i<n; ++i){
        for (int j=0; j<n; ++j){
            op(n);
        }
    }
}
```

★ Multiple Choice



## Exercise 2 – Algorithm Analysis

### 2.2 What is the time complexity of do()?

- A.  $O(1)$
- B.  $O(\log n)$
- C.  $O(n)$
- D.  $O(n \log n)$
- E.  $O(n^2)$
- F.  $O(n^3)$

```
void op(int size){
    for (int i=0; i<size; ++i){
        int fa = 888;
    }
}

void do(){
    for (int i=0; i<n; ++i){
        for (int j=0; j<n; ++j){
            op(n);
            op(8);
        }
    }
}
```

★ Multiple Choice

## Exercise 2 – Algorithm Analysis

### 2.3 What is the time complexity of do()?

- A.  $O(1)$
- B.  $O(\log n)$
- C.  $O(n)$
- D.  $O(n \log n)$
- E.  $O(n^2)$
- F.  $O(n^3)$

```
void op(int size){
    for (int i=0; i<size; ++i){
        int fa = 888;
    }
}

void do(){
    if (/* some random conditional */) {
        op(n);
    }
    else {
        op(881);
    }
}
```

★ Multiple Choice

## Exercise 2 – Algorithm Analysis

### 2.4 What is the time complexity of do()?

- A.  $O(1)$
- B.  $O(\log n)$
- C.  $O(n)$
- D.  $O(n \log n)$
- E.  $O(n^2)$
- F.  $O(n^3)$

★ Multiple Choice

```
void op(int size){
    for (int i=0; i<size; ++i){
        int fa = 888;
    }
}

void do(){
    if (/* some random conditional */) {
        op(n*n);
    }
    else if (/* some random conditional2 */){
        op(881);
    }
}
```



## Exercise 2 – Algorithm Analysis

### 2.5 What is the time complexity of do()?

- A.  $O(1)$
- B.  $O(\log n)$
- C.  $O(n)$
- D.  $O(n \log n)$
- E.  $O(n^2)$
- F.  $O(n^3)$

★ Multiple Choice

```
void op(int size){
    for (int i=0; i<size; ++i){
        int fa = 888;
    }
}

void do(){
    if (/* some random conditional */) {
        op(n*n);
    }
    else if (/* some random conditional2 */){
        op(n);
    }
}
```

## Exercise 2 – Algorithm Analysis

### 2.6 What is the time complexity of do()?

- A.  $O(1)$
- B.  $O(\log n)$
- C.  $O(n)$
- D.  $O(n \log n)$
- E.  $O(n^2)$
- F.  $O(n^3)$

★ Multiple Choice

```
void op(int size){
    for (int i=0; i<size; ++i){
        int fa = 888;
    }
}

void do(){
    for (int i=0; i<n; i*=2){
        op(8);
    }
}
```

## Exercise 2 – Algorithm Analysis

### 2.7 What is the time complexity of do()?

- A.  $O(1)$
- B.  $O(\log n)$
- C.  $O(n)$
- D.  $O(n \log n)$
- E.  $O(n^2)$
- F.  $O(n^3)$

★ Multiple Choice

```
void op(int size){
    for (int i=0; i<size; ++i){
        int fa = 888;
    }
}

void do(){
    for (int i=0; i<n; i*=2){
        op(n);
    }
}
```

## Exercise 2 – Algorithm Analysis

### 2.8 What is the time complexity of do()?

- A.  $O(1)$
- B.  $O(\log n)$
- C.  $O(n)$
- D.  $O(n \log n)$
- E.  $O(n^2)$
- F.  $O(n^3)$

★ Multiple Choice

```
void op(int size){
    for (int i=0; i<size; ++i){
        int fa = 888;
    }
}

void do(){
    for (int i=0; i<n; i*=3){
        op(8);
    }
}
```

## Exercise 2 – Algorithm Analysis

### 2.9 What is the time complexity of do()?

- A.  $O(1)$
- B.  $O(\log n)$
- C.  $O(n)$
- D.  $O(n \log n)$
- E.  $O(n^2)$
- F.  $O(n^3)$

```
void op(int size){
    for (int i=0; i<size; ++i){
        int fa = 888;
    }
}

void do(){
    for (int i=0; i<n; ++i){
        for (int j=0; j<n; j*=a){
            op(8);
        }
    }
}
```

★ Multiple Choice

## Exercise 2 – Algorithm Analysis

### 2.10 What is the time complexity of do()?

- A.  $O(1)$
- B.  $O(\log n)$
- C.  $O(n)$
- D.  $O(n \log n)$
- E.  $O(n^2)$
- F.  $O(n^3)$

```
void op(int size){
    for (int i=0; i<size; ++i){
        int fa = 888;
    }
}

void do(){
    for (int i=0; i<n; ++i){
        for (int j=i; j<n; ++j){
            op(8);
        }
    }
}
```

★ Multiple Choice



## Exercise 2 – Algorithm Analysis

```
int main() {  
    int n = 100;  
    for (int i=1; i<=n; i*=2) {  
        for (int j=1; j<=i; j++)  
            cout<<i*j<<endl;  
    }  
}
```

# The End