



Bachelor of IT (Computer Science)
Assignment Title
Course

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1 Algorithm Design

1.1 Jobs ADT

1.1.1 IsValidId Method

This method checks whether a provided job ID is valid. It achieves this by checking that the provided ID is greater than the minimum valid ID (1) and less than the maximum valid ID (999). If the ID meets these criteria, the method returns true indicating the ID is valid, otherwise it returns false indicating the ID is invalid.

```
ALGORITHM IsValidId(v)  
    // Given an integer (v)  
    // Returns True if v is a valid job ID  
    // Otherwise returns False  
    if  $v \geq 1$  and  $v \leq 999$   
        return True  
    else  
        return False
```

1.1.2 IsValidExecutionTime Method

This method simply checks whether a provided job execution time is valid. It achieves this by simply checking whether the execution time is greater than 0. If the execution time is greater than 0, the method returns true indicating the execution time is valid, otherwise it returns false indicating the execution time is invalid.

```
ALGORITHM IsValidExecutionTime(v)  
    // Given an integer (v)  
    // Returns True if v is a valid job execution time  
    // Otherwise returns False  
    if  $v > 0$   
        return True  
    else  
        return False
```

1.1.3 IsValidPriority Method

This method checks whether a provided job priority is valid. It achieves this by checking that the provided priority is greater than or equal to the minimum valid priority (1) and less than or equal to the maximum valid priority (9). If the priority is meets these criteria, the method returns true indicating the priority is valid, otherwise it returns false indicating the priority is invalid.

ALGORITHM *IsValidPriority(v)*
// Given an integer (v)
// Returns True if v is a valid job priority
// Otherwise returns False
if $v \geq 1$ **and** $v \leq 9$
 return *True*
else
 return *False*

1.1.4 IsTimeReceived Method

This method checks whether a provided job time received is valid. It achieves this by checking that the provided time received is greater than zero. If the time received is greater than zero, the method returns true indicating the time received is valid, otherwise it returns false indicating the time received is invalid.

ALGORITHM *IsTimeReceived(v)*
// Given a job time received (v)
// Returns True if v is a valid time received
// Otherwise returns False
if $v > 0$
 return *True*
else
 return *False*

1.2 JobCollection ADT

1.2.1 Add Method

This method adds a job to the job collection. It achieves this by first checking that the job doesn't already exist in the collection. If the job does already exist in the collection, the method returns false indicating the job was not added to the collection. If the job does not already exist in the collection, the method adds the job to the collection, increments the count variable and returns true.

ALGORITHM *Add(v)*
// Let (n) be count
// Given a job (v)
// Returns True if v was added to the jobs array (J)
// Otherwise returns False
for $i \leftarrow 0$ **in** $n - 1$ **do**
 if $v.id = J[i].id$
 return *False*
else
 $J[n] \leftarrow v$
 $n \leftarrow n + 1$
 return *True*

1.2.2 Contains Method

This method is used to check if a job exists in the job collection. It achieves this by checking if there is a job in the collection with the same ID as the provided job ID. If there is a job with the same ID the method returns true, otherwise it returns false.

ALGORITHM *Contains(v)*
// Let (n) be count
// Given a job ID (v)
// Returns True if a job with the ID v exists in the jobs array (J)
// Otherwise returns False
for $i \leftarrow 0$ **in** $n - 1$ **do**
 if $v = J[i].id$
 return *True*
else
 return *False*

1.3 Scheduler ADT

2 Analysis

2.1 Jobs ADT

2.2 JobCollection ADT

2.3 Scheduler ADT

3 Testing

3.1 Jobs ADT

3.2 JobCollection ADT

3.3 Scheduler ADT