

```
int dllInsertAfterSpec (DLList *l, void *key, void *data,
int (*cmp)(void *, void *)) {
```

```
    DLLNode *newNode, *spec;
```

```
    if (l != NULL) {
```

```
        if (l->first != NULL) {
```

```
            spec = l->first;
```

```
            while (spec->next != NULL && cmp(key, spec->data)
                != TRUE) {
```

```
            {
```

```
                spec = spec->next;
```

```
            }
```

```
            if (cmp(key, spec->next) == TRUE) {
```

```
                newnode = (DLLNode) malloc (sizeof (DLLNode));
```

```
            }
```

```
            if (newNode != NULL) {
```

```
                newNode->data = data;
```

```
                newNode->next = spec->next;
```

```
                spec->next->prev = newNode;
```

```
                spec->next = newNode;
```

```
                return TRUE
```

```
            }
```

```
        }
```

```
        return false;
```

```
    }
```

```
}
```

```

int dllInsertBeforeSpec(DLLList *l, void *key, void *data,
int (*cmp)(void *, void *)) {
    DLLNode *spec, *newNode;
    if (l != NULL) {
        if (l->first == NULL) {
            spec = l->first;
            while (spec != NULL || cmp(key, data) != TRUE) {
                spec = spec->next;
            }
            if (cmp(key, data) == TRUE) {
                newNode = (DLLNode) malloc(sizeof(DLLNode));
                if (newNode != NULL) {
                    newNode->data = data;
                    spec->prev->next = newNode;
                    newNode->next = spec;
                    newNode->prev = spec->prev;
                    return TRUE;
                }
            }
        }
        return FALSE;
    }
}

```