

Concordia University  
Department of Computer Science and Software  
Engineering

**SOEN 331 - S and U**  
**Introduction to Formal Methods**  
**for Software Engineering**

**Assignment 2 - Solutions**  
The Object-Z specification language

**Team 19 - Section U**

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# 1 Contact management

*Contacts*

$\uparrow (MakeNewContact, AddNumber, SearchForNumber, DeleteNumber)$

$numbers : \mathbb{P} PhoneNumberType$   
 $recorded : PhoneNumberType \leftrightarrow NameType$

$numbers = dom\ recorded$

*INIT*

$recorded = \emptyset$

*MakeNewContact*

$\Delta(recorded)$   
 $number? : PhoneNumberType$   
 $name? : NameType$

$number? \notin numbers$   
 $name? \notin ran\ recorded$   
 $recorded' = recorded \cup \{number? \mapsto name?\}$

*AddNumber*

$\Delta(recorded)$   
 $number? : PhoneNumberType$

$number? \notin numbers$   
 $name? \in ran\ recorded$   
 $recorded' = recorded \cup \{number? \mapsto name?\}$

*SearchForNumber*

$\exists Contacts$   
 $name? : NameType$   
 $numbers! : \mathbb{P} number$

$numbers! = \{n : number \mid recorded(n) = name?\}$

*DeleteNumber*

$\Delta(recorded)$   
 $number? : PhoneNumberType$

$number? \in numbers$   
 $recorded' = \{number?\} \triangleleft recorded$

...

*Contacts/cont.*

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