# SOEN331: Introduction to Formal Methods for Software Engineering

# Assignment 2 on Object-Z specification

Tarek Ait Hamouda (40044119), Abhijit Gupta (40066502),
Ethel Narra Pangan (40061530)

February 24, 2019

# 1 Map

*Map*

$[Description, Coordinate]$

$Point == Coordinate \times Coordinate$

$Message ::== ok \mid location\_already\_known \mid no\_location\_found$

$$locations : Description \pfun Point$$

---

$$\forall l1, l2 : locations \bullet (l1.description \neq l2.description)$$

*INIT*

$$locations = \{\}$$

*AddLocationOK*

$$\Delta(locations)$$
$$newDescription? : Description$$
$$newPoint? : Point$$

---

$$newDescription? \notin dom\ locations$$
$$locations' = locations \cup \{newDescription? \mapsto newPoint?\}$$

*DeleteLocationOK*

$$\Delta(locations)$$
$$location? : locations$$

---

$$location? \in locations$$
$$locations' = locations \setminus \{location\}$$

*ModifyLocationOK*

$$\Delta(locations)$$
$$desc? : Description$$
$$newPoint? : Point$$

---

$$desc? \in dom\ locations$$
$$locations' = locations \oplus \{desc? \mapsto newPoint?\}$$

*FindLocationOK*

$$desc? : Description$$
$$point! : Point$$

---

$$desc? \in domlocations$$
$$point! = locations(desc?)$$

*Success*

$$result! : Message$$

---

$$result! = ok$$

*LocationAlreadyKnown*

$$\Xi(locations)$$
$$description? : Descriptionresult! : Message$$

---

$$description? \in domlocations$$
$$result! = location_{a}lready_{k}nown$$

*noLocationFound*