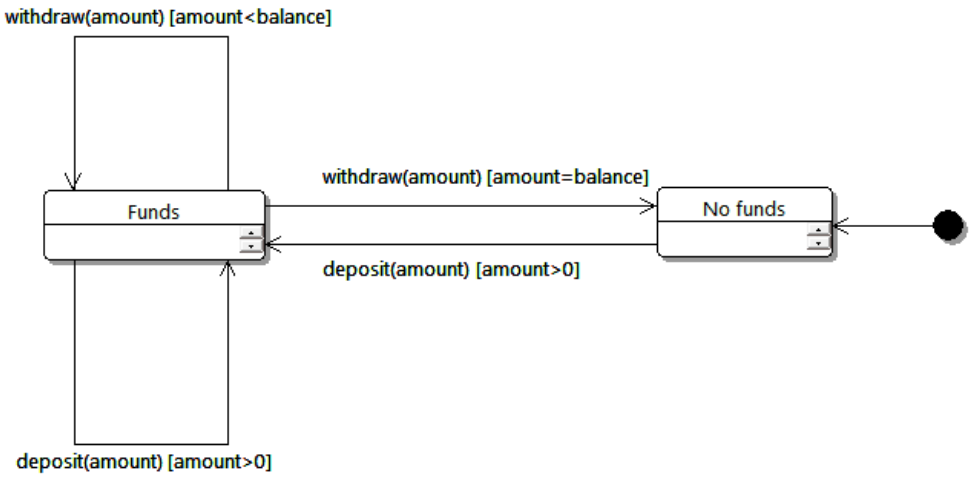
University of Stirling
Computing Science and Mathematics
CSCU9P5 Software Engineering I **Autumn 2018**

Tutorial 5 (for week starting 12 November)

1. Consider again the *state diagram* for the example of the bank account seen in lectures, given below:



   Extend the state diagram to include show that after a withdrawer requests to *withdraw* a certain amount, the account enters a state where it is *checking for funds before allowing the withdrawal (or not)* (e.g. perhaps it is checking with the bank's central account server). You will need to introduce a new state as well as new transitions.

   Extend the diagram to also include details about the creation and closing of an account (these actions are not shown in the diagrams above), under the constraint that an account can be closed only if empty.

2. A vending machine sells coffee at 50p. First you have to introduce enough money, one coin at a time, and then the coffee is delivered as soon as sufficient has been entered. The machine only accepts 10p, 20p and 50p coins. Change is given. You can assume the machine always has sufficient coins of any given amount for the change.

   Design a state diagram that describes the control behaviour of the machine. For this, assume that there is an integer attribute variable in which the total amount entered: this variable can appear in the guards and actions that appear on transitions.

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