

8 Hoare Logic (MJCG)

- (a) Describe two ways in which the interpretations of $\{P\}C\{Q\}$ differ in Hoare logic and in separation logic. [4 marks]
- (b) Which of the following equations hold for all P and Q ? In each case justify your answer.
- (i) $P \star P = P$ [2 marks]
- (ii) $P \wedge P = P$ [2 marks]
- (iii) $P \star Q = Q \star P$ [2 marks]
- (iv) $P \wedge Q = Q \wedge P$ [2 marks]
- (c) Is the Hoare triple $\{X \doteq 0 \star Y \doteq 1\} [X] := Y \{X \mapsto 1 \star Y \doteq 1\}$ true? If so give a proof, stating any rules that you use; if not, explain why not. [4 marks]
- (d) Is the Hoare triple $\{X \mapsto 0 \star Y \doteq 1\} [X] := Y \{X \mapsto 1 \star Y \doteq 1\}$ true? If so give a proof, stating any rules that you use; if not, explain why not. [4 marks]