Functional and Logic Programming
cpsc 370 Fall 2018
Currying Questions—Monday, September 17 2018

Questions

(2) **1.** Consider the relations

- $A = \{\, (\bot, \{\, (\spadesuit, \pi), (\clubsuit, \pi) \,\}), (\top, \{\, (\spadesuit, \pi), (\clubsuit, 3) \,\}) \,\}$

- $B = \{\, (\bot, \{\, (\spadesuit, \pi), (\clubsuit, \pi) \,\}), (\top, \{\, (\clubsuit, 3) \,\}) \,\}$

- $C = \{\, ((3, \clubsuit), \top), ((3, \spadesuit), \bot), ((\pi, \clubsuit), \bot), ((\pi, \spadesuit), \bot) \,\}$

(a) Which of the above are functions? Why?

(b) Are either sets A or B Curried functions? Why or why not?

(c) The set C is a function. What is its Curried form?

2. Sometimes it is useful to consider subsets as defined by a function on the larger set that returns true if and only if an element is a member of a subset. Let $\mathbf{2} = \{\, \top, \bot \,\}$ be the set containing true ($\top$) and false ($\bot$). The observation about subsets means that the power set of S, $\mathcal{P}(S)$ can be thought of as a set of functions: $\mathcal{P}(S) \equiv \mathbf{2}^S$.

Use this and Currying to explain why a relation r on $S \times T$ can be thought of as a function $\hat{r}$ from S to $\mathcal{P}(T)$.