Part B

```
datatype listop = emptyList of exp
                | isEmpty of exp
                | cons of exp * exp
                | car of exp * exp
                | cdr of exp * exp
```

$$\frac{\Gamma \vdash e : \tau \quad `}{\Gamma \vdash \text{emptyList}(e) : \text{LISTTY}(\tau)} \quad \texttt{(emptyList)}$$

$$\frac{\Gamma\ e_1 : \tau_1 \quad e_2 : \text{LISTTY}(\tau_2) \quad \tau_1 = \tau_2 \quad `}{\Gamma \vdash \text{cons}(e_1\ e_2) : \text{LISTTY}(\tau_1)} \quad \text{(car)}$$

$$\frac{\Gamma \vdash e : \text{LISTTY}(\tau) \quad `}{\Gamma \vdash \text{car}(e) : \tau} \quad \text{(car)}$$

$$\frac{\Gamma \vdash e : \text{LISTTY}(\tau) \quad `}{\Gamma \vdash \text{car}(e) : \text{LISTTY}(\tau)} \quad \text{(cdr)}$$

$$\frac{\Gamma \vdash e : \text{LISTTY}(\tau) \quad `}{\Gamma \vdash \text{isEmpty}(e) : \text{bool}} \quad \text{(isEmpty)}$$