# 1 Exercises

1. Describe what is meant by object-oriented programming.

2. Describe what is meant by the term *inheritance* in object-oriented programming. Use examples.

3. A coin is weighted so that heads is four times as likely as tails. Find the probability that: (a) tails appears, (b) heads appears

4. Under which of the following functions does $S = \{a_1, a_2\}$ become a probability space?
   (a) $P(a_1) = \frac{1}{3}$, $P(a_2) = \frac{1}{2}$ (b) $P(a_1) = \frac{3}{4}$, $P(a_2) = \frac{1}{4}$
   (c) $P(a_1) = 1$, $P(a_2) = 0$ (d) $P(a_1) = \frac{5}{4}$, $P(a_2) = -\frac{1}{4}$

5. Identify, if any, the sinks and sources of the digraph shown in Figure 1.

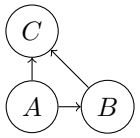


Figure 1: Digraph for Question 5

# 2 Solutions

3 Let $p = P(T)$, then $P(H) = 4p$. We require $P(H) + P(T) = 1$, so $4p + p = 1$, hence $p = \frac{1}{5}$. Therefore: (a) $P(T) = \frac{1}{5}$, (b) $P(H) = \frac{4}{5}$

4 4b and 4c

5 $A$ is a souce and $C$ is a sink.