1 Exercise I, Kearns p. 50

NOTE: I will use italics instead of CAPS to represent predicates, I will use the symbol $\wedge$ instead of & to indicate logical 'and', and I will use the symbol $\neg$ instead of the tilde to represent negation.

(1) $\exists x[young(x) \wedge woman(x) \wedge arrived(x)]$
Here we can get away without grouping two of the sub-propositions with parentheses because it doesn't make a difference: $(p \wedge q) \wedge r$ is equivalent to $p \wedge (q \wedge r)$.

(2) $\exists x[sinister(x) \wedge saw(i, x)]$
i = Ida

(3) $\forall x[road(x) \rightarrow leadto(x, r)]$
r = Rome

(4) $\forall x[(traveller(x) \wedge from(x, s)) \rightarrow welcome(u, x)]$
u = Utopia

(5) $\exists x[castle(x) \wedge in(x, e)]$
e = Edinburgh

(6) $\exists x[person(x) \wedge murdered(x, c)]$
c = Clive
Note that since the English quantifier 'someone' can quantify only over people (vs. 'something'), I added the restriction that x satisfy the predicate *person*.

(7) $\exists x[person(x) \wedge murdered(x, c)]$
This has the same logical form as the last one, even though 'someone' isn't specified in the syntax. The sentence still entails that someone has murdered Clive, so we need to represent this.

(8) $\exists x[sank2(x, b)]$
b = the boat
$sank2(x, y)$ = a two place predicate that denotes a relation between objects such that the first sank the second.
This sentence, like (7) also entails that some cause or agent caused the boat to sink, so I added an existential quantifier and translated the verb as a two-place predicate. Also, since the cause or agent of sinking doesn't have to be a person, I did not add a *person* predicate like in (7).

(9) $sank1(b)$
b = the boat
The difference between (9) and (8) is that (9) does NOT entail that there was an agent or cause of the sinking; the boat may have just sunk 'on its own'. This requires us to introduce a different 1-place predicate $sank1$ to represent the meaning of this sentence.

(10) can be translated in two ways, which are logically equivalent:

(10) a. $\forall x[person(x) \rightarrow \neg saw(x, c)]$
b. $\neg\exists x[person(x) \wedge saw(x, c)]$
$c =$ Charles

Here I'm assumign that 'nobody' only applies to people, though if you think that animals like dogs and cats count as 'nobodies', you'd want to modify this.

(11) $\forall x[(letter(x) \wedge wrote(j, x, m)) \rightarrow sent(m, x, r)]$
$m =$ Maxine
$j =$ John
$r =$ Ruth
$wrote(x, y, z) =$ a three place predicate that denotes the relation between three things such that the first wrote the second to the third
$sent(x, y, z) =$ a three place predicate that denotes the relation between three things such that the first sent the second to the third

The last example is ambiguous: (12a) corresponds to the interpretation paraphrased in (13a); (12b) corresponds to the interpretation paraphrased in (13b).

(12) a. $\forall x[puppy(x) \rightarrow (fed(g, x) \vee fed(b, x))]$
b. $\forall x[puppy(x) \rightarrow fed(g, x)] \vee \forall y[puppy(y) \rightarrow fed(b, y)]$
$g =$ Gina
$b =$ Boris

(13) a. Every puppy is such that Gina or Boris fed it.
b. Gina fed every puppy or Boris fed every pupppy.