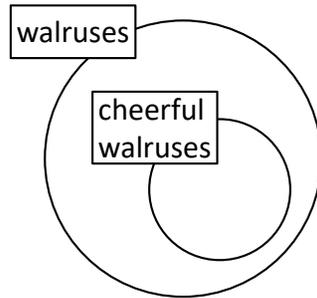# (B) Game: Set Match (1/2) [10 Points]

Consider the word *walruses* and the phrase *cheerful walruses*. The diagram below shows one way to illustrate the relationship between these phrases.


Each circle stands for the set of things that could be described by the relevant word or phrase. Since all cheerful walruses are walruses, the region for *cheerful walruses* is fully contained inside the region for *walruses*. The sizes of the circles are irrelevant; what matters is how they overlap and which ones are contained inside others.

This example relates to an important question: how does the meaning of a phrase relate to the meanings of the words that make it up? This question comes up in computational linguistics because computers that process language must be able to determine the meanings of complex phrases. In this problem, we highlight some of the nuances of this topic.

Note that this problem only gives a partial picture of meaning in language. The diagrams on this page depict the relationships between certain words and phrases, but they do not provide complete meanings for these words and phrases. Some of the nuances that are left out of this problem are important in linguistic theories, but for the sake of this problem you should only use the information presented.

Below are 18 words and phrases given in <u>arbitrary order</u>, along with a diagram representing their meanings. Some of their meanings are clarified in the *Notes* section on the following page.

A. *alleged spies*
B. *berries*
C. *big elephants*
D. *blueberries*
E. *cars*

F. *elephants*
G. *fruits*
H. *future spies*
I. *green cars*
J. *green Italian cars*

K. *happy spies*
L. *Italian cars*
M. *purple Italian cars*
N. *small big elephants*
O. *small blueberries*

P. *small elephants*
Q. *spies*
R. *strawberries*
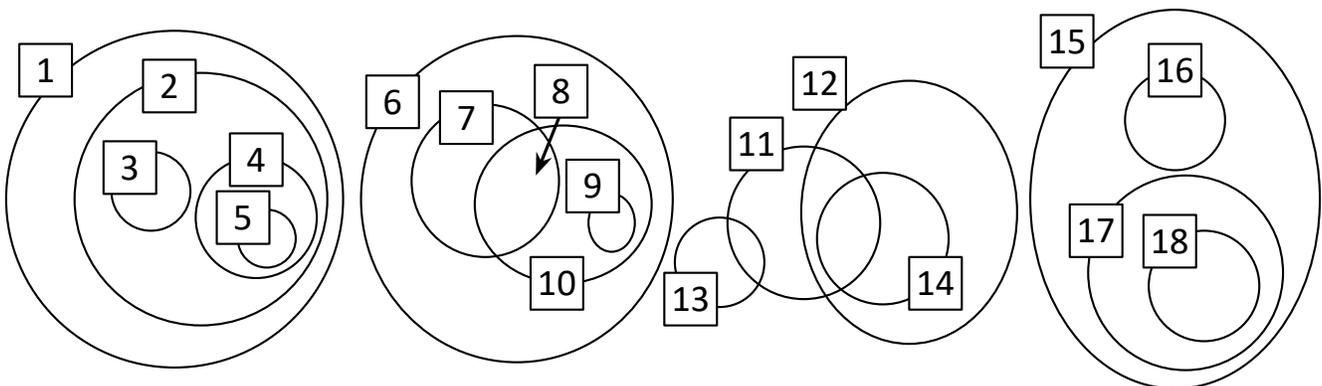
(B) Game: Set Match (2/2)

B1. Each of the words or phrases A–R corresponds to one of the regions 1–18 in the diagram on the previous page. Match each region to the word or phrase it corresponds to:

1. ☐ 2. ☐ 3. ☐ 4. ☐ 5. ☐ 6. ☐

7. ☐ 8. ☐ 9. ☐ 10. ☐ 11. ☐ 12. ☐

13. ☐ 14. ☐ 15. ☐ 16. ☐ 17. ☐ 18. ☐

Notes:

- Each number goes with the circle that it touches, except for 8, which goes with the intersection of the 7 and 10 circles.
- *Alleged spies* are people who have been accused of being spies but who may or may not actually be spies.
- The phrase *small big elephants* may be confusing without context. Here's an example where it can occur: "That's a big elephant, but compared to other big elephants it's relatively small; it's a small big elephant."
- We assume that cars cannot be both green and purple at the same time.
- In this problem, we use the informal definition of the word *berry*, in which strawberries are a type of berry (even though there is a technical definition of *berry* that excludes strawberries).
- We assume that elephants cannot be spies. In real life, this is a dangerous assumption to make.