► **Problem 11.3-01 (g)**
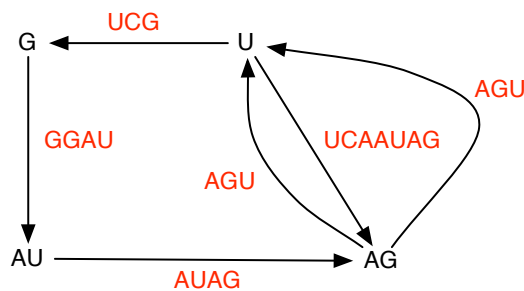
Answer the following questions for the pair of fragment lists given.

(i) From how many RNA chains could the given list of G-fragments arise? From how many chains could the given list of U,C-fragments arise? Which of the these numbers provides a better estimate of the the number of RNA chains whose G-fragments and U,C-fragments are as described?

(ii) Find all RNA chains with the given complete enzyme digests.

G-fragment: UCG, AUAG, AG, UCAAUAG, G

U,C-fragment: C, AGU, AG, GGAU, C, AGU, AAU

Solution. The G-fragments arise from any of $5! = 120$ possible chains. Since the chain ends at AG, the U,C-fragments arise from any of $6!/(2!2!) = 180$ chains. The better estimate is 120 chains. Note that there are four Eulerian circuits ending at AG, but only two of these represent different solutions because arc AGU is repeated (see the following figure). The solutions are AGUCAAUAGUCGGAUAG and AGUCGGAUAGUCAAUAG.