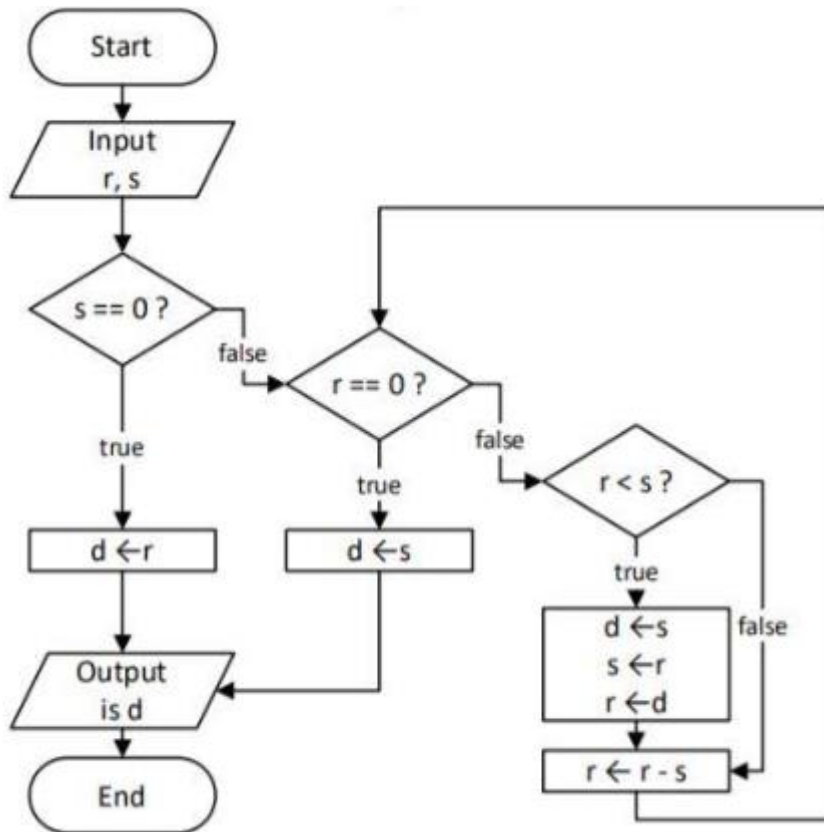


WEEK 8 ALGORITHMS AND FLOWCHARTS (PRACTISE)

SPOT QUESTIONS

1. Given a flowchart as shown below, conceive an algorithm for the same.



What will be the value of d if $r=12$ and $s=8$?

2. Develop an algorithm for the following problem:

Blizzard has come over the whole state, covering all highways with 40 inches of snow. To keep the distribution of food, roads between major cities need to be cleared, so that each major city can be reached from each other. But getting rid of the snow from a highway is expensive - \$1000 per mile. You, member of the Emergency Services, need to devise a plan that keeps all major cities connected through cleared roads, with the cost of clearing as small as possible. You are given the list of distances (in miles) of direct connections (i.e., not going through any other major city) between the major cities. You have to do the math, and choose which of those connections should be cleared.

3.

The flow chart in Figure Q5 represents an algorithm that contains an infinite loop. In this question the task is to consider each numbered process, one at a time. Is it possible to adjust what is added or subtracted in the first equation in the process to avoid an infinite loop whilst keeping the other processes the same as in the figure? For example, in Process 1 only the +1 can be changed, the rest of the process must not be changed. What is added must be an integer although it can be positive, zero or negative. The answer should be either no change will avoid an infinite loop or an example of the first equation in the process that will avoid the infinite loop. Provide an answer for:

- When only the first equation in Process 1 is changed. [1 Mark]
- When only the first equation in Process 2 is changed. [1 Mark]
- When only the first equation in Process 3 is changed. [1 Mark]
- When only the first equation in Process 4 is changed. [1 Mark]
- What is the value of COUNT in cases when End is reached? [2 Marks]

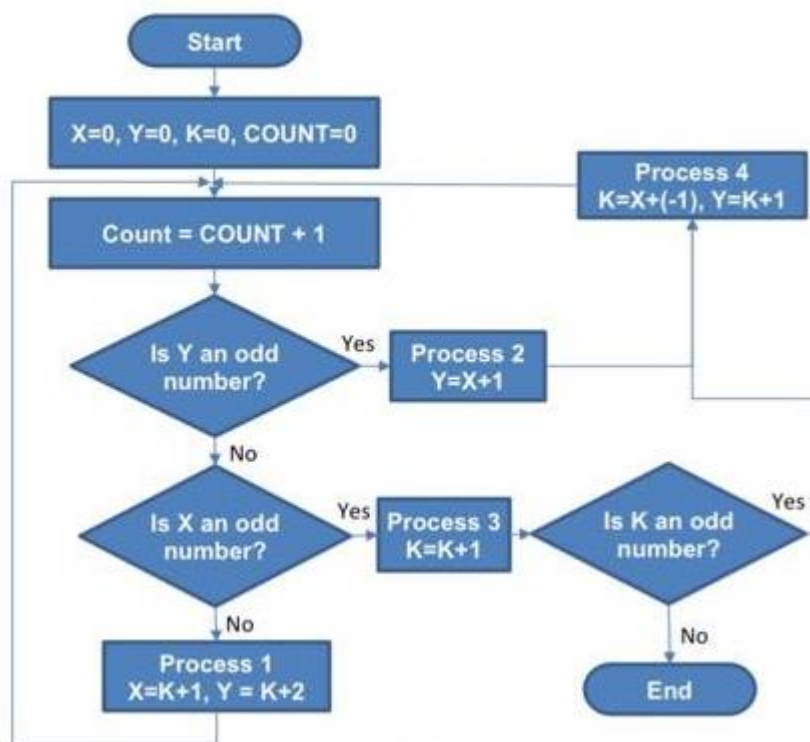


Figure Q5: Flowchart for question 5

4. Trace the algorithm described by the flowchart and determine what will be the value in R1 when the program exits.

