

SQA Assignment 4 – Spring 2016

Due: Monday, March 28, 2016 (beginning of class)

Problem Descriptions:

Suppose we are to test an income tax calculation system. An input to the system contains two numbers, (X, Y). If X = 1, it means it is for “single” filing; X = 2, for “joint” filing; other numbers are invalid input. Y represents the income of the filing and must be an integer positive number.

The tax calculation rule follows.

For single filing:

Income range	Tax rate
0-\$6K (inclusive)	0
\$6K - \$55K (incl. \$55K)	10%
\$55K - \$105K (incl. \$105K)	20%
\$105K - \$160K (incl. \$160K)	30%
\$160K and above	40%

For joint filing

Income range	Tax rate
0-\$10K (inclusive)	0
\$10K - \$70K (incl. \$70K)	10%
\$70K - \$120K (incl. \$120K)	20%
\$120K - \$250K (incl. \$200K)	30%
\$250K and above	40%

For example, with an input of (2, 90K), the calculation would be:

First \$10K, no tax

$(\$70K - \$10K) * 0.1 = \$6K$

$(\$90K - \$70K) * 0.2 = \$4K$

The total tax would be $\$4K + \$6K = \$10K$

Design test cases to cover all boundaries for this system. Some invalid test cases must also be designed. Note: a test case should contain both input and expected output, i.e., (X, Y), tax).