Simultaneous Offers Game Strategy Paper

Bargaining strategies for the following model are to be pitted against one another.   Two programmed
negotiating strategies will interact by making a series of simultaneous offers to divide 100 units between
them. Bargaining ends successfully when the strategies make proposals that exactly divide the 100 units. If
100 rounds of bargaining pass without agreement, bargaining ends with each strategy getting a payoff of
zero. The strategy with the highest average payoff across all interactions will be declared the winner.

Rules for strategy submission:
1. The submitted strategy must be complete over all possible rounds of play.
2. It must specify proposals in whole-number (i.e., integer) terms.
3. The initial proposal may be predetermined (e.g., a specific number) or randomly generated in some range.
4. Subsequent proposals may be predetermined, based on previous proposals, or some mix thereof. If based on previous proposals, they may be based any portion of the previous history.
5. Strategies may be submitted as written descriptions following the above rules (which I will then translate into programming language) or as programming formulas that will run in QBASIC. (See examples below.)

Here is an example of a strategy pairing written in QBASIC. The items highlighted are subject to change
for submitted strategies.

```
strategy1:                                    strategy2:
'Strategy name:                               'Strategy name:
s1$ = "Bully"                                 s2$ = "Compromise"
IF t = 0 THEN RETURN                          IF t = 0 THEN RETURN
'Opening proposal:                            'Opening proposal:
IF t = 1 THEN s1(t) = 100                     IF t = 1 THEN s2(t) = INT(RND * 50) + 50
'Subsequent proposals:                        'Subsequent proposals:
IF t > 1 THEN s1(t) = 101 – t                 IF t > 1 THEN s2(t) =
'Check for valid proposal and correct:        (s2(t – 1) + 100 – s1(t – 1)) / 2
IF s1(t) <> INT(s1(t)) THEN s1(t) = INT(s1(t))  'Check for valid proposal and correct:
IF s1(t) > 100 OR s1(t) < 0 THEN s1(t) =      IF s2(t) <> INT(s2(t)) THEN s2(t) = INT(s2(t))
INT(RND * 100) + 1                            IF s2(t) > 100 OR s2(t) < 0 THEN s2(t) =
RETURN                                        INT(RND * 100) + 1
                                              RETURN
```

Here is one possible result of the above strategy pairing. The S1 and S2 columns are the offers each strategy
made per period.

Sample Output
```
S1: Bully
S2: Compromise
Period          S1              S2
 1              100             51
 2              99              71
 3              98              36
 4              97              19
 5              96              11
 6              95              67
 7              94              36
 8              93              21
 9              92              14
10              91              11
11              90              10
Successful bargain struck.
```