FORTRAN program for computing a measure of the population quality of Legislative apportionment

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Some interest has been shown in the second writer's measure of the population quality of legislative apportionment (Kaiser, 1968). Unfortunately, while this index appears to have some theoretical elegance, its computation requires, at least, a desk electronic calculator with a logarithmic routine, or preferably, a full-blown high-speed electronic computer. In this note, we give a FORTRAN program developed on a CDC 3600 computer for determining this measure.

The required inputs to the program are:

K, the number of legislative districts; ENJ(J), J = 1, K, the vector of district populations.

The outputs of the programs are:

K, the number of legislative districts; ENJ(J), J = 1, K, immediately after input the vector of district

populations which we labeled N(J); EN, the total population across districts which we labeled N; AVE, the average district population; ENJ(J), J = 1, K, at the end of the program the vector of district population ratios which we labeled R(J); G, the geometric mean of the population ratios; B, the measure of the population quality of legislative apportionment. A sample output based on California's delegation to the United States House of Representatives, 89th Congress is provided in Table 1.

The program without formal input-output statement follows.

```

EN = .0
DO 50 J = 1,K
50  EN = EN + ENJ(J)
FK = K
AVE = EN/FK
PROD = 1.0
DO 51 J = 1,K
51  ENJ(J) = ENJ(J)/AVE
    PROD = PROD * ENJ(J)
EX = 1.0/FK
G = PROD ** EX
B = 1.0 - (1.0 - G*G) ** .5

```

Availability. A free card deck of the program is available upon request. Write: Dr. Andrew C. Porter, National Institute of Education, Office of Research, Room 851 I, Washington, D. C. 20208.

Table 1
Output Example for California's Delegation to the United States House of Representatives, 89th Congress

K	38										
N(J)	533807	406506	502778	310669	301872	438444	333530	373286	383498	460210	
	444387	379010	368100	409030	407283	496859	376115	510341	377991	388171	
	364865	393907	408099	399322	372357	388421	360558	588933	396813	391541	
	396220	435458	503591	447421	473511	420015	395989	373296			
N	15717204										
AVE	413610.6316										
R(J)	1.291	.983	1.216	.751	.730	1.060	.806	.903	.927	1.113	
	1.074	.916	.890	.989	.985	1.201	.909	1.234	.914	.938	
	.882	.952	.987	.965	.900	.939	.872	1.424	.959	.947	
	.958	1.053	1.218	1.082	1.145	1.015	.957	.915			
G	.990069										
B	.859419										

The research reported in this note was supported in part by the Office of Computing Activities, National Science Foundation.

Andrew C. Porter is now on leave to the National Institute of Education.

REFERENCE

Kaiser, H. F. A measure of the population quality of legislative apportionment, *American Political Science Review*, 1968, 62, 208-215.