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Supplemental Data: Table S1A. Matching/mismatching of RF classification analysis of 39830 PFGE patterns (including G1 and G2) adjusted by NCTR fixed band method using Group 1 as the standard set of band classes. Two-fold cross validation was used with 100 repetitions.

Serotype	4,5,12:-	Agona	Braenderup	Enteritidis	Hadar	Heidelberg	Infantis	Javiana	Mississippi	Montevideo	Muenchen	Newport	Oranienburg	Paratyphi B var. L(+)-tartrate+	Poona	Saintpaul	Thompson	Typhi	Typhimurium	Typhimurium var. 5-	Anatum	Bareilly	Berta	Derby	Hartford	Litchfield	Mbandaka	Panama	Paratyphi A	Schwarzengrund	Senftenberg	Stanley		
1,4,[5],12:-	1710	0	0	0	0	0	0	0	0	0	1	0	0	0	3	0	0	0	151	49	0	1	0	0	0	0	0	0	0	0	0	0	1	
Agona	0	1951	0	0	0	2	2	0	2	4	3	1	1	0	2	3	1	0	0	1	2	1	0	11	0	1	0	2	1	0	2	0	1	
Braenderup	0	0	1846	1	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1	0	0	1	0	0	0	1	0	1		
Enteritidis	0	0	0	1837	1	0	0	0	0	0	0	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Hadar	1	0	0	0	1815	0	0	0	0	0	2	0	0	0	3	1	0	0	0	2	0	4	0	0	0	0	0	2	0	0	0	0	0	
Heidelberg	0	0	0	0	0	1919	0	0	0	0	0	0	0	0	2	0	0	0	1	3	1	0	0	0	0	0	0	1	0	1	2	0	0	
Infantis	0	1	1	0	0	0	1839	0	1	1	7	4	0	1	1	0	2	3	0	0	8	0	3	3	0	0	0	0	0	0	1	0	1	0
Javiana	0	0	0	0	4	0	0	1791	1	0	0	0	1	0	8	0	0	0	0	0	2	0	0	0	0	0	11	0	0	0	1	1	0	
Mississippi	0	0	0	0	2	0	0	0	1800	0	2	1	1	0	6	0	0	0	1	0	1	1	5	0	0	0	1	0	0	0	1	0	1	0
Montevideo	1	1	0	2	1	0	0	0	1	1870	0	0	3	1	0	0	2	1	1	0	0	1	0	2	1	0	0	0	0	0	0	1	1	0
Muenchen	0	0	1	0	2	0	1	0	3	1	1857	2	0	1	3	1	1	0	0	0	0	1	0	2	1	1	0	0	0	0	0	1	1	0
Newport	0	0	0	1	1	0	0	1	1	0	0	1815	1	2	1	2	0	0	0	0	0	4	0	0	0	1	1	0	0	3	1	1	0	
Oranienburg	0	0	0	0	0	1	0	0	0	0	0	0	1939	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	
Paratyphi B var. L(+)-tartrate+	0	0	0	0	0	0	1	0	0	1	0	1	1814	2	2	0	0	0	1	0	6	2	0	0	0	0	0	1	1	0	0	8	0	
Poona	1	0	0	0	5	0	0	3	2	0	0	0	0	0	1809	0	0	1	1	1	0	2	0	1	0	0	0	2	0	1	4	0	0	
Saintpaul	0	0	0	0	1	1	0	0	0	0	0	0	3	0	2	1881	0	0	1	2	0	5	0	0	0	1	0	3	0	0	0	0	0	
Thompson	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1834	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Typhi	0	0	1	0	1	0	0	3	1	0	2	0	1	1	5	0	0	1935	0	1	2	0	0	0	1	0	0	0	0	0	0	0	2	0
Typhimurium	95	0	0	0	0	0	0	0	0	0	1	0	0	0	2	2	0	0	1267	457	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Typhimurium var. 5-	40	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	419	1317	1	0	0	0	0	0	0	0	0	0	0	0	1	0
Anatum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	215	0	0	0	0	0	0	0	0	0	0	0	0	0
Bareilly	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	162	0	0	0	0	0	0	0	0	0	1	0	0
Berta	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	204	0	0	0	1	0	0	0	0	0	0	0	0
Derby	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	186	0	0	0	0	0	0	0	0	0	0	0
Hartford	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	211	0	0	0	0	0	0	0	0	0
Litchfield	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	229	0	0	0	0	0	0	0	
Mbandaka	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	269	0	0	0	0	0	0	
Panama	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	205	1	0	0	0	
Paratyphi A	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	133	0	0	0	0	
Schwarzengrund	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	218	0	1	0
Senftenberg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	175	0	
Stanley	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	202	0
Total	1849	1953	1850	1843	1834	1923	1843	1800	1812	1877	1876	1825	1951	1824	1855	1894	1841	1941	1841	1833	222	201	209	212	218	237	270	228	135	225	189	219		
Average Accuracy	92.5%	99.9%	99.8%	99.7%	99.0%	99.8%	99.8%	99.5%	99.3%	99.6%	99.0%	99.5%	99.4%	99.5%	97.5%	99.3%	99.6%	99.7%	68.8%	71.8%	96.8%	80.6%	97.8%	87.7%	97.0%	96.6%	99.6%	89.7%	98.3%	96.8%	92.4%	92.3%	96.0%	

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Table S1B. Matching/mismatching of SVM classification analysis of 39830 PFGE patterns (including G1 and G2) adjusted by NCTR fixed band method using Group 1 as the standard set of band classes. Two-fold cross validation was used with 100 repetitions.

Predicted Serotype	4,[5],12:i:-	Agona	Braenderup	Enteritidis	Hadar	Heidelberg	Infantis	Javiana	Mississippi	Montevideo	Muenchen	Newport	Oranienburg	Paratyphi B var. L(+) tartrate+	Poona	Saintpaul	Thompson	Typhi	Typhimurium	Typhimurium var. 5-	Anatum	Bareilly	Berta	Derby	Hartford	Litchfield	Mbandaka	Panama	Paratyphi A	Schwarzengrund	Senftenberg	Stanley	
14,[5],12:i:-	1710	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	156	52	0	0	1	0	0	0	0	0	0	0	0	0	1
Agona	0	1952	0	0	0	0	0	0	0	0	0	0	0	0	1	2	1	0	0	0	1	0	0	7	0	1	1	0	1	0	0	0	
Braenderup	0	0	1843	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Enteritidis	0	0	0	1837	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	
Hadar	1	0	0	0	1815	0	0	0	0	0	1	1	0	0	1	0	0	0	0	2	1	2	0	0	0	0	0	3	0	1	0	0	
Heidelberg	0	0	0	0	0	1918	0	0	0	0	0	0	0	0	0	0	0	0	1	3	0	0	0	0	0	0	0	1	0	0	1	0	
Infantis	0	0	0	0	0	0	1839	0	1	0	2	2	0	0	0	0	1	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0
Javiana	0	0	0	0	2	0	0	1793	1	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	1	0	
Mississippi	0	0	1	0	1	2	3	0	1801	1	1	3	0	0	4	0	0	1	0	1	2	2	2	6	0	2	2	1	0	0	0	0	
Montevideo	0	0	0	2	1	0	0	0	0	1872	0	0	2	2	0	0	4	0	0	0	1	2	0	0	2	0	0	0	0	0	0	0	
Muenchen	0	0	1	0	2	0	1	0	0	1	1867	2	0	1	1	1	1	0	0	0	0	2	0	1	2	0	0	0	0	0	1	0	
Newport	0	0	3	1	2	0	0	1	1	0	0	1815	0	1	0	1	0	0	0	0	0	1	0	1	1	4	0	0	0	1	0	0	
Oranienburg	0	0	0	0	0	0	0	0	0	0	0	0	1941	0	0	0	3	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	
Paratyphi B var. L(+) tartrate+	0	0	0	0	0	0	0	0	0	1	2	2	1813	0	2	0	0	0	0	1	0	5	5	2	0	1	0	0	0	0	1	6	
Poona	2	0	1	0	7	2	0	5	4	0	1	1	2	4	1834	3	0	1	1	3	0	2	0	7	0	3	1	4	0	3	11	2	
Saintpaul	0	0	0	0	1	1	0	0	0	0	0	0	3	0	0	1882	0	0	1	1	0	2	0	0	0	0	0	1	0	0	0	0	
Thompson	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1832	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Typhi	0	0	1	0	1	0	0	0	0	0	2	0	0	0	4	0	0	0	0	0	0	0	0	0	2	0	1	0	0	0	0	0	
Typhimurium	95	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0	1247	454	0	0	0	0	0	0	0	0	0	0	0	
Typhimurium var. 5-	41	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	435	1316	1	0	0	0	0	0	0	0	0	0	0	
Anatum	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	216	0	0	0	0	0	0	0	0	0	0	0	
Bareilly	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	178	0	1	0	0	0	0	0	1	0	0	
Berta	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	200	0	0	0	0	0	0	0	0	0	0	
Derby	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	187	0	0	0	0	0	0	0	0	
Hartford	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	210	0	0	0	0	0	0	0	
Litchfield	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	224	0	0	0	0	0	0	
Mbandaka	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	266	0	0	0	0	0	
Panama	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	209	1	0	0	0	
Paratyphi A	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	132	0	0	0	
Schwarzengrund	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	218	0	0	
Senftenberg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	174	0	
Stanley	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	210	
Total	1849	1953	1850	1843	1834	1923	1843	1800	1812	1877	1876	1825	1951	1824	1855	1894	1841	1941	1841	1833	222	201	209	212	218	237	270	228	135	225	189	219	
Average accuracy	92.5%	#####	99.6%	99.7%	98.9%	99.7%	99.8%	99.6%	99.4%	99.7%	99.5%	99.4%	99.5%	99.4%	98.9%	99.4%	99.5%	99.9%	67.8%	71.8%	97.4%	88.7%	95.9%	88.1%	96.2%	94.5%	98.5%	91.8%	98.1%	96.8%	91.9%	95.7%	96.1%

17 Supplemental Data:

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19 Table S2A: The detail matching/mismatching of further validation on additional 6,093 PFGE patterns (Group 3) by RF classification
20 algorithm.

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Predicted Serotype	4,[5],12:i:-	Braenderup	Enteritidis	Hadar	Heidelberg	Infantis	Javiana	Mississippi	Montevideo	Muenchen	Newport	Paratyphi B var. L(+) tartrate+	Poona	Saintpaul	Thompson	Typhimurium var. 5-	Typhimurium var	Anatum	Bareilly	Berta	Derby	Hartford	Litchfield	Mbandaka	Panama	Stanley	
I 4,[5],12:i:-	403	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18	14	0	0	0	0	0	0	0	0	0	0
Agona	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	3	0	6	0	0	1	0	0	
Braenderup	0	158	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	4	0	0	0	0	0	0	
Enteritidis	0	0	494	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	
Hadar	0	0	0	145	0	0	0	0	0	0	1	0	0	0	0	0	2	1	9	1	0	0	0	0	0	0	
Heidelberg	0	0	0	0	191	0	0	0	0	0	0	0	0	0	0	1	1	2	0	0	0	0	0	0	0	0	
Infantis	1	0	0	0	0	235	0	0	0	0	0	0	0	0	0	0	1	0	2	0	3	0	0	0	0	0	
Javiana	0	0	0	0	0	0	298	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	14	0	
Mississippi	0	0	0	1	0	0	0	184	0	0	1	0	0	0	0	0	0	1	2	2	0	1	0	0	0	0	
Montevideo	0	0	0	0	0	0	0	0	163	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	2	
Muenchen	1	0	0	0	0	0	0	1	0	93	1	0	0	1	0	0	0	0	3	0	3	0	0	0	2	0	
Newport	0	0	0	1	0	0	2	1	0	0	172	0	0	1	0	0	0	1	1	1	0	0	1	0	0	2	
Oranienburg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	0	0	0	0	0	
Paratyphi B var. L(+) tartrate+	1	0	0	0	0	0	0	0	0	1	4	187	0	0	0	1	1	1	2	3	0	0	1	0	0	11	
Poona	0	0	0	0	0	0	2	0	0	0	0	0	99	0	0	0	0	0	0	1	1	0	0	0	4	0	
Saintpaul	1	0	1	0	0	0	0	0	0	0	0	0	0	356	0	1	0	0	1	0	0	0	0	0	0	1	
Thompson	0	0	0	0	0	0	0	0	0	0	0	0	1	0	204	0	0	1	0	0	0	0	0	0	0	1	
Typhi	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	4	0	0	0	0	
Typhimurium	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	139	66	0	0	0	0	0	0	0	0	0	
Typhimurium var. 5-	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	62	227	0	0	0	0	0	0	0	0	0	
Anatum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	250	0	0	0	0	0	0	0	0	
Bareilly	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	201	0	0	1	0	0	1	0	
Berta	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	279	0	0	0	0	0	0	
Derby	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	163	0	0	0	0	0	
Hartford	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	307	0	0	0	0	
Litchfield	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	1	0	162	0	0	0	
Mbandaka	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	161	0	0	
Panama	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	267	0	
Stanley	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	224	
Total	431	158	495	147	191	235	302	187	164	94	180	187	101	358	204	223	313	256	225	293	181	313	164	162	288	241	
Accuracy	93.5%	100.0%	99.8%	98.6%	100.0%	100.0%	98.7%	98.4%	99.4%	98.9%	95.6%	100.0%	98.0%	99.4%	100.0%	62.3%	72.5%	97.3%	88.9%	95.2%	90.1%	98.1%	98.8%	99.4%	92.7%	92.9%	94.5%

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26 Table S2B: The detail matching/mismatching of further validation on additional 6,093 PFGE patterns (Group 3) by SVMclassification
 27 algorithm.
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Predicted Serotype	4,[5],12:i-	Braenderup	Enteritidis	Hadar	Heidelberg	Infantis	Javiana	Mississippi	Montevideo	Muenchen	Newport	Paratyphi B var. L(+) tartrate+	Poona	Saintpaul	Thompson	Typhimurium var. 5-	Typhimurium var	Anatum	Bareilly	Berta	Derby	Hartford	Litchfield	Mbandaka	Panama	Stanley	
4,[5],12:i-	405	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22	19	0	0	0	0	0	0	0	0	0	0
Agona	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0
Braenderup	0	158	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Enteritidis	0	0	494	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Hadar	1	0	0	145	0	0	0	0	0	0	1	0	0	0	0	0	3	1	2	0	0	1	0	0	0	0	0
Heidelberg	0	0	0	0	191	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0
Infantis	0	0	0	0	0	234	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	0	0	0	0	0	0
Javiana	0	0	0	0	0	0	300	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	11	0	
Mississippi	0	0	0	0	0	1	0	185	0	0	0	0	0	0	0	0	0	0	3	4	0	0	0	0	0	0	1
Montevideo	0	0	0	0	0	0	0	0	163	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	
Muenchen	0	0	0	0	0	0	0	0	0	93	0	0	0	2	1	0	0	0	2	0	2	0	0	0	2	0	
Newport	0	0	0	1	0	0	0	0	0	0	175	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Oranienburg	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Paratyphi B var. L(+) tartrate+	1	0	0	0	0	0	0	0	0	1	2	186	0	0	0	0	1	2	2	1	1	0	1	0	0	3	
Poona	0	0	0	1	0	0	2	2	0	0	1	0	101	0	0	0	0	1	1	0	3	0	0	0	0	6	
Saintpaul	1	0	0	0	0	0	0	0	0	0	0	0	0	356	0	0	0	0	0	0	1	0	0	0	0	0	
Thompson	0	0	0	0	0	0	0	0	0	0	0	0	0	0	202	0	0	0	0	0	0	0	0	0	0	0	
Typhi	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	
Typhimurium	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	141	69	0	0	0	0	0	0	0	0	0	
Typhimurium var. 5-	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	60	219	0	0	0	0	0	0	0	0	0	
Anatum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	253	0	0	0	0	0	0	0	0	
Bareilly	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	212	0	1	1	0	0	3	0	
Berta	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	286	0	0	0	0	0	0	
Derby	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	165	0	0	0	0	0	
Hartford	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	310	0	0	0	0	
Litchfield	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	163	0	0	0	
Mbandaka	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	161	0	0	
Panama	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	271	0	
Senftenberg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	
Stanley	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	229	
Total	431	158	495	147	191	235	302	187	164	94	180	187	101	358	204	223	313	256	225	293	181	313	164	162	288	241	
Accuracy	94.0%	100.0%	99.8%	98.6%	100.0%	99.6%	99.3%	98.9%	99.4%	98.9%	97.2%	99.5%	100.0%	99.4%	99.0%	63.2%	70.0%	98.4%	93.8%	97.6%	91.2%	99.0%	99.4%	99.4%	94.1%	95.0%	95.1%

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 31
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