

Appendix 11

The Result of Pre Test per Element

No	Students' Code	Item Number																																								Total Correct		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40			
1	A	1	1	1	0	0	1	1	0	1	0	0	1	1	0	1	0	0	0	0	1	1	1	0	1	0	0	0	0	1	1	0	1	0	0	1	0	1	0	1	0	0	19	
2	B	1	1	1	0	0	0	0	1	0	1	0	1	0	1	1	0	1	1	1	1	0	1	0	1	0	1	1	1	1	0	0	0	0	1	1	0	0	0	0	1	0	20	
3	C	0	0	1	0	0	0	1	0	1	0	0	1	0	1	0	0	1	1	1	1	0	1	0	0	1	0	1	0	1	1	1	0	1	1	0	1	0	1	0	1	20		
4	D	1	1	0	0	1	0	0	1	0	1	0	1	0	1	1	1	0	0	1	1	0	0	1	0	1	1	1	0	1	0	1	1	1	0	1	1	0	1	1	1	1	24	
5	E	1	0	1	1	1	0	1	0	1	0	1	0	1	0	0	1	1	1	0	0	1	1	0	1	0	0	0	1	0	1	0	0	1	1	1	1	1	1	1	1	1	25	
6	F	0	1	1	0	0	1	1	0	1	1	1	0	0	1	0	0	1	0	1	1	1	1	1	0	1	1	1	1	0	1	1	1	1	1	1	1	1	0	1	0	1	27	
7	G	1	0	0	1	1	0	1	1	1	0	0	1	1	0	1	1	0	1	1	0	0	0	0	1	0	1	0	1	0	1	1	0	0	0	1	0	0	0	1	1	0	0	19
8	H	1	1	1	0	1	1	1	0	0	1	0	0	0	1	1	0	0	0	1	1	1	1	1	1	0	1	1	0	0	1	1	0	1	1	1	1	0	0	1	1	1	27	
9	I	0	1	1	0	1	1	1	0	1	1	0	1	1	1	0	1	1	1	0	1	0	1	0	1	1	1	1	0	1	1	0	1	0	0	1	0	1	1	0	0	1	25	
10	J	0	0	1	0	1	0	0	0	0	0	1	1	1	0	1	0	1	1	1	0	0	1	1	0	1	0	0	1	1	0	0	1	1	0	0	1	0	0	1	0	1	1	20
11	K	1	0	1	1	0	1	1	0	1	1	0	1	0	1	0	1	0	1	1	1	1	0	1	1	0	0	1	0	0	1	0	0	1	0	1	1	0	0	1	1	0	23	
12	L	1	1	1	0	1	1	1	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	1	0	0	1	0	1	1	1	1	1	0	1	1	1	0	1	0	1	1	25	
13	M	1	1	1	0	0	1	1	0	1	0	1	0	0	1	0	1	0	1	0	1	1	1	1	1	1	0	1	0	1	1	0	1	1	0	1	0	1	0	1	0	1	1	25
14	N	0	0	0	1	0	1	1	0	0	1	0	1	1	0	1	0	1	0	1	1	0	0	1	0	0	1	0	1	0	0	0	1	0	0	1	0	1	0	1	0	1	18	
15	O	1	0	1	0	1	0	0	0	1	0	1	0	1	1	0	0	1	1	0	0	1	1	0	0	0	1	1	0	1	1	0	1	1	0	1	1	1	1	1	0	1	22	
16	P	0	0	0	1	1	0	1	1	0	0	0	1	0	1	1	0	0	1	1	1	1	1	0	1	1	1	1	0	1	1	0	0	1	1	1	0	0	0	1	0	0	21	
17	Q	1	0	1	0	0	1	1	0	0	1	1	0	1	0	0	1	1	0	0	1	0	1	1	0	1	0	1	0	1	0	1	0	0	0	1	0	1	0	1	1	1	0	20
18	R	1	1	0	1	1	0	1	0	0	0	1	1	0	1	0	0	0	1	1	0	1	1	0	1	0	1	0	1	0	1	1	1	1	1	1	1	1	1	0	1	0	1	24
19	S	1	0	1	0	0	1	1	0	0	1	0	0	1	0	0	1	1	0	0	1	1	0	1	0	0	1	0	0	1	1	0	1	1	0	1	1	0	1	1	1	1	21	
20	T	1	1	1	0	1	0	0	1	1	0	1	0	0	1	1	1	0	1	1	1	1	1	0	1	1	0	1	1	1	1	1	0	1	1	1	1	0	0	1	1	0	27	
21	U	0	1	1	0	1	0	1	1	1	0	0	1	0	1	1	1	1	1	1	0	1	1	1	0	1	1	0	1	1	1	1	1	0	1	1	0	1	1	1	1	1	29	
22	V	1	0	0	1	0	1	0	0	0	1	0	0	1	0	0	1	0	1	0	1	1	0	0	1	0	1	1	1	1	0	1	0	0	0	1	1	0	1	1	1	1	20	
23	W	1	0	1	0	1	0	0	0	0	1	0	1	0	1	1	0	1	1	1	1	0	1	1	0	0	0	0	0	1	0	0	0	1	1	0	0	1	1	0	0	1	18	
24	X	0	0	1	0	1	0	0	0	0	1	0	1	0	0	0	0	1	1	1	1	0	0	1	1	1	1	0	1	1	1	1	0	0	1	0	0	0	0	0	1	0	1	18
25	Y	1	0	0	1	0	1	1	0	1	0	1	1	0	0	1	0	0	0	1	0	1	1	0	0	0	1	1	1	0	0	0	0	1	1	0	1	1	1	1	1	0	21	
26	Z	1	0	0	1	1	0	0	0	0	1	0	0	1	0	0	1	1	1	1	1	0	1	1	1	0	1	1	1	1	1	1	0	1	1	1	1	1	0	0	0	0	1	23
27	AA	1	0	0	0	0	1	0	1	0	1	0	1	0	1	1	1	1	1	0	0	1	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	1	1	1	0	16
28	AB	1	0	1	0	1	0	1	0	0	1	0	0	1	0	0	1	1	1	1	1	0	0	0	1	0	0	1	0	1	1	0	0	1	1	1	0	1	0	0	0	0	1	19
29	AC	1	0	1	0	0	1	0	0	0	1	1	1	1	1	1	0	1	0	1	0	1	1	1	0	0	1	1	1	1	0	0	1	1	0	0	0	0	0	0	0	0	0	20
30	AD	1	1	1	0	1	0	1	1	0	0	0	1	0	0	1	1	1	1	0	1	0	1	1	0	1	1	1	1	1	1	1	0	1	1	1	1	1	0	0	1	1	1	27
31	AE	1	1	1	0	0	1	1	1	0	1	0	1	1	0	1	0	1	1	1	1	0	0	1	0	1	0	1	1	1	0	1	0	0	1	1	1	1	0	1	1	0	1	26
Total		23	12	22	9	17	15	20	10	12	18	10	19	13	16	17	15	20	22	21	19	18	21	17	14	13	21	17	21	23	16	9	19	26	16	17	16	12	24	18	20	689		

The Result of Post Test per Element

No	Students' Code	Item Number																																								Total correct		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40			
1	A	1	1	0	1	1	1	0	1	0	0	1	0	1	0	1	0	1	1	1	1	1	0	1	1	1	0	1	1	0	1	0	0	0	0	1	0	0	0	1	0	1	23	
2	B	1	1	1	0	1	1	0	1	0	1	1	0	1	0	1	1	1	1	1	1	1	0	1	1	0	0	1	1	0	1	1	0	0	1	1	0	1	1	1	0	27		
3	C	0	1	1	0	0	1	1	0	1	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	1	0	0	1	1	0	0	0	0	0	0	1	0	19	
4	D	1	0	1	1	1	0	0	1	1	0	1	0	1	1	1	1	1	0	1	0	1	0	1	0	1	0	1	0	1	1	1	0	1	1	1	0	1	1	1	1	27		
5	E	1	1	0	1	0	1	1	0	1	1	0	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	0	1	1	0	1	0	1	0	1	0	1	1	0	0	28		
6	F	1	0	1	0	1	1	1	1	0	1	1	1	1	0	1	1	1	1	1	1	0	1	1	1	0	1	1	0	1	1	0	1	0	1	1	0	1	1	0	0	1	28	
7	G	1	1	0	1	0	1	1	0	1	0	1	1	0	1	0	1	0	1	1	1	1	1	0	1	0	1	0	1	0	1	0	0	1	1	1	0	1	1	1	0	1	26	
8	H	1	0	1	0	1	1	0	1	1	1	1	0	1	1	1	0	1	1	1	1	0	1	1	1	1	1	1	1	1	1	0	1	1	1	1	0	1	1	0	1	1	31	
9	I	1	1	1	1	0	1	1	0	1	0	1	1	1	1	0	1	1	1	0	1	0	1	0	1	0	1	0	1	0	1	1	1	0	1	1	1	1	1	1	0	1	28	
10	J	0	0	1	0	1	1	1	1	0	1	1	1	1	1	1	0	1	0	1	1	1	1	1	1	0	1	1	1	1	1	0	1	0	1	0	0	0	1	0	1	0	26	
11	K	1	1	1	1	0	1	0	0	1	0	1	1	0	1	0	1	0	1	1	1	1	1	0	1	0	1	1	1	1	1	1	0	1	1	1	1	0	1	1	1	1	1	29
12	L	1	1	1	0	1	1	1	1	0	1	0	1	1	0	1	1	1	1	1	1	1	1	1	0	1	1	1	0	1	1	1	0	1	1	1	1	1	1	0	1	1	30	
13	M	1	1	1	1	1	1	0	0	1	0	1	1	1	1	0	1	1	1	0	1	0	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	0	1	0	1	1	29	
14	N	1	0	1	0	0	1	1	1	1	1	0	1	0	1	1	1	0	1	1	1	1	0	1	1	1	1	1	1	1	0	1	0	0	1	0	0	0	0	0	0	0	0	24
15	O	1	1	0	1	1	0	1	1	1	0	1	1	1	1	0	1	1	1	0	0	0	1	1	1	0	1	0	1	0	1	0	1	0	0	1	0	0	1	0	1	1	1	26
16	P	1	1	1	0	0	1	0	1	0	1	0	0	1	1	1	1	0	1	1	1	1	0	1	1	1	1	1	1	1	1	0	1	0	0	1	1	0	1	0	0	1	26	
17	Q	0	1	0	0	1	1	1	0	1	0	1	1	0	1	0	0	1	1	1	0	0	1	1	1	1	1	0	1	0	1	0	1	0	1	1	0	1	1	0	1	1	1	25
18	R	1	0	1	0	1	1	0	1	1	1	0	0	1	0	1	1	0	1	1	1	1	0	1	1	1	1	1	1	1	1	0	0	0	1	0	1	1	0	0	0	0	24	
19	S	1	1	0	1	1	1	1	0	1	0	1	1	0	1	0	0	1	1	1	1	1	1	1	1	1	0	1	0	1	1	1	1	0	1	0	0	0	0	0	1	1	1	26
20	T	1	1	1	1	1	1	0	1	0	1	0	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	0	1	0	0	1	32	
21	U	1	1	1	1	1	1	1	1	1	0	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	0	0	1	0	1	1	0	1	1	1	1	33	
22	V	1	0	0	1	1	1	0	1	0	1	1	1	1	1	1	0	1	1	1	0	1	0	1	1	1	1	1	0	1	0	0	1	0	0	1	0	1	0	0	1	0	0	24
23	W	1	0	1	0	1	1	1	0	1	1	1	1	0	1	0	1	0	1	1	1	0	1	0	1	0	1	0	1	0	1	0	0	1	0	0	1	0	0	1	0	1	0	23
24	X	1	1	0	1	0	1	0	1	0	1	0	0	1	0	0	0	1	1	0	0	1	0	1	0	1	1	1	1	1	0	1	1	0	0	1	1	1	0	0	1	22		
25	Y	1	0	1	0	1	1	1	1	1	0	1	1	0	1	1	1	0	1	1	1	0	1	1	1	0	1	1	1	0	1	0	0	0	0	1	0	1	0	1	1	0	26	
26	Z	1	1	1	1	0	1	0	1	0	1	0	1	1	0	0	0	1	1	1	1	1	0	1	1	1	0	1	0	1	0	0	0	1	1	0	1	0	1	1	0	0	24	
27	AA	0	0	1	0	1	0	1	0	1	1	1	0	0	1	0	1	0	0	1	1	0	0	0	1	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	14
28	AB	1	1	0	0	0	1	0	1	0	1	1	1	0	0	1	0	1	0	0	1	1	0	1	0	1	0	1	1	1	0	1	1	1	0	1	0	0	0	0	0	0	1	21
29	AC	0	0	1	0	1	1	1	0	1	1	1	0	1	1	0	1	0	1	1	1	1	0	1	0	1	0	1	0	1	0	1	1	1	1	0	0	0	1	0	0	0	24	
30	AD	1	1	0	1	1	1	1	1	0	1	0	1	0	1	1	0	1	0	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	0	1	0	1	1	0	1	30	
31	AE	1	0	1	0	1	1	0	1	1	0	1	1	1	1	0	1	0	1	1	1	1	1	1	1	0	1	1	1	1	1	1	0	1	0	1	1	1	1	0	0	29		
Total		26	19	21	15	21	28	17	20	19	19	21	22	20	23	16	21	18	26	25	25	22	19	24	25	19	26	20	26	21	19	14	17	19	16	15	15	17	18	14	18	806		