1c.
This is a program to find the min and max of an array of numbers:
https://github.com/anthonywittemann/MIPS-Assembly-EE-352/blob/master/Lab3Problem1.asm

Line numbers 26 and 40 provide an example of spatial locality, using $t1 as a counter to increment the access of the array by 4 each time.
Line numbers 28 and 34 demonstrate temporal locality, repeatedly accessing the value of $a0. These would be replicated for every index in an array of n elements.

5.2.1

Address	Binary	Tag	Index	Hit?
3	0000_0011	0: 0000	0011	F
180	1011_0100	11: 1011	0100	F
43	0010_1011	2: 0010	1011	F
2	0000_0010	0: 0000	0010	F
191	1011_1111	11: 1011	1111	F
88	0101_1000	5: 0101	1000	F
190	1011_1110	11: 1011	1110	F
14	0000_1110	0: 0000	1110	F
181	1011_0101	11: 1011	0101	F
44	0010_1100	2: 0010	1100	F
186	1011_1010	11: 1011	1010	F
253	1111_1101	15: 1111	1101	F

5.2.2

Address	Binary	Tag	Index	Offset	Hit?
3	0000_0011	0	001	1	F
180	1011_0100	11	010	0	F
43	0010_1011	2	101	1	F
2	0000_0010	0	001	0	True
191	1011_1111	11	111	1	F
88	0101_1000	5	100	0	F
190	1011_1110	11	111	0	True
14	0000_1110	0	111	0	F
181	1011_0101	11	010	1	True
44	0010_1100	2	110	0	F
186	1011_1010	11	101	0	F
253	1111_1101	15	110	1	F

5.2.3

Above two tables are 1 and 2 word block cache examples. Below is a four word block example.

Address	Binary	Tag	Index	Offset	Hit?
3	0000_0011	0	00	11	F
180	1011_0100	11	01	00	F
43	0010_1011	2	10	11	F
2	0000_0010	0	00	10	True
191	1011_1111	11	11	11	F
88	0101_1000	5	10	00	F
190	1011_1110	11	11	10	True
14	0000_1110	0	11	10	F
181	1011_0101	11	01	01	True
44	0010_1100	2	11	00	F
186	1011_1010	11	10	10	F
253	1111_1101	15	11	01	F

As C1 has no hits and both C2 and C3 have the same number of hits, because C2 has the lower access time it is the better choice for this specific set of references.
Time taken -
C1: 0*2 + 12*25 = 300
C2: 3*3 + 9*25 = 234 ← Lowest total access time
C3: 3*5 + 9*25 = 240

5.2.6

The XOR method of indexing would an acceptable way to index a cache, but this method would require a maximum of 16 cache blocks while the current cache supplies 1024, meaning the cache would have to be *greatly* curtailed.