CA Assignment - 8

1Ans) Spatial localities - If a particular storage location is referenced at a particular time, then it is likely that nearby memory locations will be referenced in the near future. In this case, it is common to attempt to guess the size and shape of the area around the current reference for which it is worthwhile to prepare faster access for subsequent reference.

Temporary localities - If at one point a particular memory location is referenced, then it is likely that the same location will be referenced again in the near future. There is a temporary proximity between the adjacent references to the same memory location. In this case it is common to make efforts to store a copy of the referenced data in faster memory storage, to reduce the latency of subsequent references. Temporal locality is a special case of spatial locality, namely when the prospective location is identical to the present location.

For example -

```
for (i=0 ; i<20 ; i++)
    for (j=0; j<10 ; j++)
        a[i] = a[i]*j ;
```

- a[1] is accessed after a[0] both are near memory locations and hence example of spatial locality.
- a[0] is accessed for j=0 and for j=1 ; same memory location accessed in nearby time and hence example of temporary locality.

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S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
					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						

2nd) I would recommend the processor with registers and memory to the processor that has only memory because processor with registers can operate on register contents at the rate of more than one operator in one clock cycle whereas other processor accesses memory at the much slower rate than processor with the registers one. In addition to that, we can control the registers where as memory cannot be controlled and the main theme of the processor is to control or compute something and that need to be stored in some storage locations which are indeed called registers.