8] Parallelization is where multiple cores or threads in a CPU are assigned to the same task in order to shorten the processing time. This is beneficial as it can significantly reduce processing time when compared to a single core. Parallel processing works by dividing a much larger task into several smaller tasks which are solved simultaneously. Parallel processing is more complex to program than regular sequential programs. One example of this is establishing communication and synchronisation between the different processes which is the greatest obstacle when creating an efficient parallelized program. Parallelization is limited to a maximum speed and can be calculated using Amdahl’s Law.

T(n) = T(1)(B+1/2(1-b))

T(n) = time taken on n threads

N = number of threads

B = fraction of algorithm that is sequential

For example, if a program requires 10 hours using a single core and 90% of the program is parallelised. Then no matter how many cores are assigned to the process, it will never reach under 1 hour .

T(1) = T(1)(0.9+(1-0.9)) = 1 hour

The speed up of a program using parallelization is limited by the percentage of sequential parts of the code.

9]

Array = [11,5,2,7,1]

Temp = 0

Moreswaps = True

While moreswaps = True

Moreswaps = False

For I = 0 to length(array)-1 then

If Array[i} <= Array[I + 1] then  
 temp = array[I + 1]

Array[i+1] = Array[i}

myArray[i] = temp

moreswaps = true

end if

end for

10]An algorithm is an unambiguous set of instructions to solve a problem. Algorithms can also be written in natural language, like English.

b) Terminating Condition, Calls itself

c) Can be complex to program

if the terminating condition isn’t met, the algorithm continues indefinitely

11}

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | DATA | NEXT POINT 1 | NEXT POINT 2 | NEXT POINT 3 |
| 0 | SMITH | 4 | 4 |  |
| 1 | JONES | 3 | 3 | 3 |
| 2 | AHMED | 5 | 5 | 5 |
| 3 | LEWIS | 0 | 6 | 6 |
| 4 | THOMAS | -1 | -1 | -1 |
| 5 | BROWN | 1 | 7 | 7 |
| 6 | MURPHY |  | 0 | 4 |
| 7 | COLLINS |  | 1 | 1 |
|  |  |  |  |  |

BROWN

THOMAS

LEWIS

AHMED

JONES

SMITH

12]

Trucation is where the decimal points in a number are disregarded and cut to the whole number

Rounding is where the decimal points are moved to the nearest whole number

3.6 trucates to 3

3.6 rounds to 4

b) Rounding

c)Absoluted = original – new

relative = error/ original