Viva (OpenMP | PADP)

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- Mandelbrot set is the set of complex numbers 'c' for which the function $f_c(z) = z^2 + c$ does not diverge when iterated from $z=0$. (Wikipedia)
- The program computes an image of the Mandelbrot set.
- The program returns an image of size 500 by 500 in the PPM format.

The specifics of the program are:

Each point $C = x + i*y$.

X_range = [-2.25, 1.25]

Y_range = [-1.75, 1.75]

A total of 2000 iterations are carried out to convert these points into their corresponding RGB values.

These part of conversion is carried out using the OpenMP directives.

- The variables shared between the threads are:

(b, count, count_max, g, r, x_max, x_min, y_max, y_min.)

(The "shared" scope defined in the code indicates this)

- The variables having private scope in each thread are:
(i), j, k, x, x1, x2, y, y1, y2).
("private" scope defined indicates this)

- The program has an overall runtime complexity of O(n x m x count_max). Using the OpenMP directives. (FOR) we are parallelising these iterations thus reducing the time required to generate the "ppm" image.

- I modified the program to carry out the execution ~~parallelly~~ sequentially without any OpenMP directives. The overall timing achieved was 0.878898 s.

- The time taken for execution in parallel using OpenMP was 0.469337 s