

# Serial Programming vs Parallel Programming

Consider below application which is used to demonstrate the difference between serial programming approach and parallel programming approach.

```
1 from threading import *;
2 from multiprocessing import *;
3 from time import *;
4 from os import *;
5
6 def Square(no):
7     print(getpid());
8     return no * no;
9
10 def main():
11     arr = [1,31,41,3,5,4,2];
12     brr = [];
13
14     starttime1 = time();
15     for i in range(len(arr)):
16         brr.append(Square(arr[i]));
17     endtime1 = time();
18
19     print(brr);
20
21     print("Serial", endtime1 - starttime1);
22
23     pobj = Pool();
24
25     starttime2 = time();
26     crr = pobj.map(Square,arr);
27     endtime2 = time();
28
29     print(crr);
30
31     print("Parallel", endtime2 - starttime2);
32     print(getpid());
33
34 if __name__ == "__main__":
35     main();
```

## Output of above application

```
Desktop — -bash — 51x20
(base) MacBook-Pro-de-MARVELLOUS:Desktop marvellous$ python hello.py
681
681
681
681
681
681
681
681
[1, 961, 1681, 9, 25, 16, 4]
Serial 6.604194641113281e-05
682
683
684
682
683
682
683
[1, 961, 1681, 9, 25, 16, 4]
Parallel 0.0017740726470947266
```

