```
Initial Parameters...
R(load) = 500 \text{ ohms}
r = 1.00
w = 0.50
_____
INITIAL Particle 1 :: pos(duty) = 0.12202052 fitness(Output Power) = 10.64447425
INITIAL Particle 2 :: pos(duty) = 0.26843882 fitness(Output Power) = 10.64447425
INITIAL Particle 3 :: pos(duty) = 0.25784617 fitness(Output Power) = 10.64447425
______
_____
Iteration No: 1
c1 = 0.33166524 c2 = 0.15223401
velocity =
       0
  -0.0089
  -0.0083
Particle 1 :: pos(duty) = 0.12202052 fitness(Output Power) = 10.64447425
Particle 2 :: pos(duty) = 0.25952288 fitness(Output Power) = 10.64447425
Particle 3 :: pos(duty) = 0.24957526 fitness(Output Power) = 10.64447425
Updated best Fitness Position = 0.12202052
Iteration No: 2
c1 = 0.34800766 c2 = 0.12165845
velocity =
  -0.0111
  -0.0103
Particle 1 :: pos(duty) = 0.12202052 fitness(Output Power) = 10.64447425
Particle 2 :: pos(duty) = 0.24837358 fitness(Output Power) = 10.64447425
Particle 3 :: pos(duty) = 0.23923255 fitness(Output Power) = 10.64447425
Updated best Fitness Position = 0.12202052
Iteration No: 3
c1 = 0.88415306 c2 = 0.09427839
velocity =
       0
  -0.0103
  -0.0096
```

```
Particle 1 :: pos(duty) = 0.12202052
                                       fitness(Output Power) = 10.64447425
Particle 2 :: pos(duty) = 0.23803399 fitness(Output Power) = 10.64447425
Particle 3 :: pos(duty) = 0.22964098
                                        fitness(Output Power) = 10.64447425
Updated best Fitness Position = 0.12202052
_____
Iteration No: 4
c1 = 0.93004063 c2 = 0.39901997
velocity =
        0
  -0.0237
  -0.0220
Particle 1 :: pos(duty) = 0.12202052 fitness(Output Power) = 10.64447425
Particle 2 :: pos(duty) = 0.21434751 fitness(Output Power) = 10.64447425
Particle 3 :: pos(duty) = 0.20766811 fitness(Output Power) = 10.64447425
Updated best Fitness Position = 0.12202052
-----
Iteration No: 5
c1 = 0.04740146 c2 = 0.34237350
velocity =
        0
  -0.0245
  -0.0227
Particle 1 :: pos(duty) = 0.12202052 fitness(Output Power) = 10.64447425
                                       fitness(Output Power) = 10.64447425
Particle 2 :: pos(duty) = 0.18986015
Particle 3 ::
             pos(duty) = 0.18495228 fitness(Output Power) = 10.64447425
Updated best Fitness Position = 0.12202052
Iteration No: 6
c1 = 0.73596616 c2 = 0.79468216
velocity =
  -0.0338
  -0.0314
Particle 1 :: pos(duty) = 0.12202052 fitness(Output Power) = 10.64447425
Particle 2 :: pos(duty) = 0.15605209 fitness(Output Power) = 10.64447425
Particle 3 :: pos(duty) = 0.15359007 fitness(Output Power) = 10.64447425
```

```
Updated best Fitness Position = 0.12202052
_____
Iteration No: 7
c1 = 0.54490590 c2 = 0.68622346
velocity =
        0
  -0.0262
  -0.0243
Particle 1 :: pos(duty) = 0.12202052 fitness(Output Power) = 10.64447425
Particle 2 :: pos(duty) = 0.12980676 fitness(Output Power) = 10.64447425
Particle 3 :: pos(duty) = 0.12924346 fitness(Output Power) = 10.64447425
Updated best Fitness Position = 0.12202052
_____
Iteration No: 8
c1 = 0.89363270 c2 = 0.05479179
velocity =
        0
  -0.0133
  -0.0123
Particle 1 :: pos(duty) = 0.12202052 fitness(Output Power) = 10.64447425
Particle 2 :: pos(duty) = 0.11651344 fitness(Output Power) = 10.64447425
Particle 3 :: pos(duty) = 0.11691185 fitness(Output Power) = 10.64447425
Updated best Fitness Position = 0.12202052
_____
Iteration No: 9
c1 = 0.30366138 c2 = 0.04619156
velocity =
        0
  -0.0065
  -0.0061
Particle 1 :: pos(duty) = 0.12202052 fitness(Output Power) = 10.64447425
Particle 2 :: pos(duty) = 0.10996853 fitness(Output Power) = 10.64447425
Particle 3 :: pos(duty) = 0.11084044 fitness(Output Power) = 10.64447425
Updated best Fitness Position = 0.12202052
```

```
_____
Iteration No: 10
c1 = 0.19547676 c2 = 0.72016580
velocity =
  1.0e-03 *
        Ω
   0.1993
   0.1849
Particle 1 :: pos(duty) = 0.12202052 fitness(Output Power) = 10.64447425
Particle 2 :: pos(duty) = 0.11016785 fitness(Output Power) = 10.64447425
Particle 3 :: pos(duty) = 0.11102533 fitness(Output Power) = 10.64447425
Updated best Fitness Position = 0.12202052
_____
Iteration No: 11
c1 = 0.72175327 c2 = 0.87779907
velocity =
        0
   0.0043
   0.0040
Particle 1 :: pos(duty) = 0.12202052 fitness(Output Power) = 10.64447425
Particle 2 :: pos(duty) = 0.11442921 fitness(Output Power) = 10.64447425
Particle 3 :: pos(duty) = 0.11497841 fitness(Output Power) = 10.64447425
Updated best Fitness Position = 0.12202052
Iteration No: 12
c1 = 0.58243296 c2 = 0.07068434
velocity =
        0
   0.0023
   0.0022
Particle 1 :: pos(duty) = 0.12202052 fitness(Output Power) = 10.64447425
Particle 2 :: pos(duty) = 0.11677453 fitness(Output Power) = 10.64447425
Particle 3 :: pos(duty) = 0.11715405 fitness(Output Power) = 10.64447425
Updated best Fitness Position = 0.12202052
Iteration No: 13
```

```
c1 = 0.92274457 c2 = 0.80037209
velocity =
        Λ
   0.0029
   0.0026
Particle 1 :: pos(duty) = 0.12202052 fitness(Output Power) = 10.64447425
Particle 2 :: pos(duty) = 0.11962669 fitness(Output Power) = 10.64447425
Particle 3 :: pos(duty) = 0.11979987 fitness(Output Power) = 10.64447425
Updated best Fitness Position = 0.12202052
_____
Iteration No: 14
c1 = 0.28594686 c2 = 0.54366323
velocity =
        0
   0.0019
   0.0018
Particle 1 :: pos(duty) = 0.12202052 fitness(Output Power) = 10.64447425
Particle 2 :: pos(duty) = 0.12157334 fitness(Output Power) = 10.64447425
Particle 3 :: pos(duty) = 0.12160569 fitness(Output Power) = 10.64447425
Updated best Fitness Position = 0.12202052
_____
Iteration No: 15
c1 = 0.98477624 c2 = 0.71567807
velocity =
        Λ
   0.0011
   0.0010
Particle 1 :: pos(duty) = 0.12202052 fitness(Output Power) = 10.64447425
Particle 2 :: pos(duty) = 0.12267468 fitness(Output Power) = 10.64447425
             pos(duty) = 0.12262735 fitness(Output Power) = 10.64447425
Particle 3 ::
Updated best Fitness Position = 0.12202052
_____
Iteration No: 16
c1 = 0.83896960 c2 = 0.43326056
velocity =
  1.0e-03 *
```

```
0
   0.4373
   0.4057
Particle 1 :: pos(duty) = 0.12202052
                                       fitness(Output Power) = 10.64447425
Particle 2 :: pos(duty) = 0.12311198 fitness(Output Power) = 10.64447425
Particle 3 :: pos(duty) = 0.12303302 fitness(Output Power) = 10.64447425
Updated best Fitness Position = 0.12202052
_____
Iteration No: 17
c1 = 0.47062472 c2 = 0.56071341
velocity =
  1.0e-04 *
       Ω
  -0.2615
  -0.2426
Particle 1 :: pos(duty) = 0.12202052 fitness(Output Power) = 10.64447425
Particle 2 :: pos(duty) = 0.12308583 fitness(Output Power) = 10.64447425
Particle 3 :: pos(duty) = 0.12300876 fitness(Output Power) = 10.64447425
Updated best Fitness Position = 0.12202052
_____
Iteration No: 18
c1 = 0.26909154 c2 = 0.74901847
velocity =
  1.0e-03 *
        Λ
  -0.3323
  -0.3082
Particle 1 :: pos(duty) = 0.12202052 fitness(Output Power) = 10.64447425
Particle 2 :: pos(duty) = 0.12275358 fitness(Output Power) = 10.64447425
Particle 3 :: pos(duty) = 0.12270055 fitness(Output Power) = 10.64447425
Updated best Fitness Position = 0.12202052
Iteration No: 19
c1 = 0.50388777 c2 = 0.64680967
velocity =
```

```
1.0e-03 *
        Λ
  -0.3558
  -0.3300
Particle 1 :: pos(duty) = 0.12202052 fitness(Output Power) = 10.64447425
Particle 2 :: pos(duty) = 0.12239780 fitness(Output Power) = 10.64447425
Particle 3 :: pos(duty) = 0.12237050 fitness(Output Power) = 10.64447425
Updated best Fitness Position = 0.12202052
_____
Iteration No: 20
c1 = 0.30774558 c2 = 0.13872464
velocity =
  1.0e-03 *
       Ω
  -0.1988
  -0.1844
Particle 1 :: pos(duty) = 0.12202052 fitness(Output Power) = 10.64447425
Particle 2 :: pos(duty) = 0.12219897 fitness(Output Power) = 10.64447425
Particle 3 :: pos(duty) = 0.12218606 fitness(Output Power) = 10.64447425
Updated best Fitness Position = 0.12202052
Iteration No: 21
c1 = 0.47557293 c2 = 0.36245928
velocity =
  1.0e-03 *
        0
  -0.1253
  -0.1162
Particle 1 :: pos(duty) = 0.12202052 fitness(Output Power) = 10.64447425
Particle 2 :: pos(duty) = 0.12207368 fitness(Output Power) = 10.64447425
Particle 3 :: pos(duty) = 0.12206984 fitness(Output Power) = 10.64447425
Updated best Fitness Position = 0.12202052
Iteration No: 22
```

```
c1 = 0.78811343 c2 = 0.78029582
velocity =
  1.0e-04 *
        0
  -0.7924
  -0.7350
Particle 1 :: pos(duty) = 0.12202052
                                       fitness(Output Power) = 10.64447425
Particle 2 :: pos(duty) = 0.12199445 fitness(Output Power) = 10.64447425
Particle 3 :: pos(duty) = 0.12199633 fitness(Output Power) = 10.64447425
Updated best Fitness Position = 0.12202052
_____
Iteration No: 23
c1 = 0.66851221 c2 = 0.13350386
velocity =
  1.0e-04 *
        0
  -0.3823
  -0.3546
Particle 1 :: pos(duty) = 0.12202052
                                      fitness(Output Power) = 10.64447425
Particle 2 :: pos(duty) = 0.12195622 fitness(Output Power) = 10.64447425
Particle 3 :: pos(duty) = 0.12196087 fitness(Output Power) = 10.64447425
Updated best Fitness Position = 0.12202052
Iteration No: 24
c1 = 0.02155589 c2 = 0.55984071
velocity =
  1.0e-05 *
       Ω
  -0.4714
  -0.4373
Particle 1 :: pos(duty) = 0.12202052 fitness(Output Power) = 10.64447425
Particle 2 :: pos(duty) = 0.12195151 fitness(Output Power) = 10.64447425
Particle 3 :: pos(duty) = 0.12195650 fitness(Output Power) = 10.64447425
```

Updated best Fitness Position = 0.12202052

Updated best Fitness Position = 0.12202052

```
_____
Iteration No: 25
c1 = 0.30081902 c2 = 0.93940971
velocity =
  1.0e-04 *
        0
   0.2358
   0.2187
Particle 1 :: pos(duty) = 0.12202052 fitness(Output Power) = 10.64447425
Particle 2 :: pos(duty) = 0.12197508 fitness(Output Power) = 10.64447425
             pos(duty) = 0.12197837 fitness(Output Power) = 10.64447425
Particle 3 ::
Updated best Fitness Position = 0.12202052
_____
Iteration No: 26
c1 = 0.98090364 c2 = 0.28662039
velocity =
  1.0e-04 *
        0
   0.1700
   0.1577
Particle 1 :: pos(duty) = 0.12202052 fitness(Output Power) = 10.64447425
Particle 2 :: pos(duty) = 0.12199208 fitness(Output Power) = 10.64447425
Particle 3 :: pos(duty) = 0.12199414 fitness(Output Power) = 10.64447425
Updated best Fitness Position = 0.12202052
_____
Iteration No: 27
c1 = 0.80082029 c2 = 0.89611135
velocity =
  1.0e-04 *
        0
   0.1869
   0.1734
Particle 1 :: pos(duty) = 0.12202052
                                       fitness(Output Power) = 10.64447425
Particle 2 :: pos(duty) = 0.12201077
                                       fitness(Output Power) = 10.64447425
Particle 3 :: pos(duty) = 0.12201148 fitness(Output Power) = 10.64447425
```

```
_____
Iteration No: 28
c1 = 0.59752658
                  c2 = 0.88401674
velocity =
  1.0e-04 *
        0
   0.1279
   0.1187
                                        fitness(Output Power) = 10.64447425
Particle 1 ::
             pos(duty)=
                         0.12202052
Particle 2 :: pos(duty) = 0.12202356 fitness(Output Power) = 10.64447425
Particle 3 :: pos(duty) = 0.12202334 fitness(Output Power) = 10.64447425
Updated best Fitness Position = 0.12202052
Iteration No: 29
c1 = 0.94373154 c2 = 0.54915809
velocity =
  1.0e-05 *
       0
   0.5728
   0.5313
Particle 1 :: pos(duty) = 0.12202052
                                        fitness(Output Power) = 10.64447425
Particle 2 :: pos(duty) = 0.12202929 fitness(Output Power) = 10.64447425
Particle 3 :: pos(duty) = 0.12202866 fitness(Output Power) = 10.64447425
Updated best Fitness Position = 0.12202052
Iteration No: 30
c1 = 0.72838682
                  c2 = 0.57675830
velocity =
  1.0e-06 *
        0
   0.8398
   0.7790
Particle 1 :: pos(duty) = 0.12202052 fitness(Output Power) = 10.64447425
Particle 2 :: pos(duty) = 0.12203013 fitness(Output Power) = 10.64447425
Particle 3 :: pos(duty) = 0.12202944 fitness(Output Power) = 10.64447425
```

```
Updated best Fitness Position = 0.12202052
_____
Iteration No: 31
c1 = 0.02585747 c2 = 0.44653098
velocity =
  1.0e-05 *
        0
  -0.1297
  -0.1203
Particle 1 :: pos(duty) = 0.12202052 fitness(Output Power) = 10.64447425
Particle 2 :: pos(duty) = 0.12202883 fitness(Output Power) = 10.64447425
Particle 3 :: pos(duty) = 0.12202823 fitness(Output Power) = 10.64447425
Updated best Fitness Position = 0.12202052
_____
Iteration No: 32
c1 = 0.64630196 c2 = 0.52120295
velocity =
  1.0e-05 *
       0
  -0.2382
  -0.2210
Particle 1 :: pos(duty) = 0.12202052 fitness(Output Power) = 10.64447425
Particle 2 :: pos(duty) = 0.12202645 fitness(Output Power) = 10.64447425
Particle 3 :: pos(duty) = 0.12202602 fitness(Output Power) = 10.64447425
Updated best Fitness Position = 0.12202052
Iteration No: 33
c1 = 0.37231266 c2 = 0.93713467
velocity =
  1.0e-05 *
  -0.3415
  -0.3168
Particle 1 :: pos(duty) = 0.12202052 fitness(Output Power) = 10.64447425
Particle 2 :: pos(duty) = 0.12202304 fitness(Output Power) = 10.64447425
```

```
Particle 3 :: pos(duty) = 0.12202285 fitness(Output Power) = 10.64447425
Updated best Fitness Position = 0.12202052
_____
Iteration No: 34
c1 = 0.82953282 c2 = 0.84908548
velocity =
   1.0e-05 *
        0
   -0.2563
   -0.2378
Particle 1 :: pos(duty) = 0.12202052 fitness(Output Power) = 10.64447425
Particle 2 :: pos(duty) = 0.12202047 fitness(Output Power) = 10.64447425
Particle 3 :: pos(duty) = 0.12202048 fitness(Output Power) = 10.64447425
Updated best Fitness Position = 0.12202052
_____
Iteration No: 35
c1 = 0.37253424 c2 = 0.59318458
velocity =
  1.0e-05 *
         0
   -0.1271
   -0.1179
Particle 1 :: pos(duty) = 0.12202052 fitness(Output Power) = 10.64447425
Particle 2 :: pos(duty) = 0.12201920 fitness(Output Power) = 10.64447425
Particle 3 :: pos(duty) = 0.12201930 fitness(Output Power) = 10.64447425
Updated best Fitness Position = 0.12202052
Iteration No: 36
c1 = 0.87255256 c2 = 0.93350161
velocity =
   1.0e-06 *
         0
   -0.1442
   -0.1338
```

```
Particle 1 :: pos(duty) = 0.12202052 fitness(Output Power) = 10.64447425
Particle 2 :: pos(duty) = 0.12201906 fitness(Output Power) = 10.64447425
Particle 3 :: pos(duty) = 0.12201916 fitness(Output Power) = 10.64447425
Updated best Fitness Position = 0.12202052
_____
Iteration No: 37
c1 = 0.66846427 c2 = 0.20677646
velocity =
   1.0e-07 *
         \cap
    0.4864
    0.4513
Particle 1 :: pos(duty) = 0.12202052 fitness(Output Power) = 10.64447425
Particle 2 :: pos(duty) = 0.12201911 fitness(Output Power) = 10.64447425
Particle 3 :: pos(duty) = 0.12201921 fitness(Output Power) = 10.64447425
Updated best Fitness Position = 0.12202052
Iteration No: 38
c1 = 0.65385059 c2 = 0.07205155
velocity =
   1.0e-07 *
         0
    0.6499
    0.6029
Particle 1 :: pos(duty) = 0.12202052 fitness(Output Power) = 10.64447425
Particle 2 :: pos(duty) = 0.12201917 fitness(Output Power) = 10.64447425
Particle 3 :: pos(duty) = 0.12201927 fitness(Output Power) = 10.64447425
Updated best Fitness Position = 0.12202052
Iteration No: 39
c1 = 0.40672692 c2 = 0.66693153
velocity =
   1.0e-06 *
         0
    0.3916
```

1.0e-06 *

0.3633 Particle 1 :: pos(duty) = 0.12202052 fitness(Output Power) = 10.64447425 Particle 2 :: pos(duty) = 0.12201956 fitness(Output Power) = 10.64447425 Particle 3 :: pos(duty) = 0.12201963 fitness(Output Power) = 10.64447425 Updated best Fitness Position = 0.12202052 Iteration No: 40 c1 = 0.93372566 c2 = 0.81095003velocity = 1.0e-06 * 0 0.5054 0.4689 Particle 1 :: pos(duty) = 0.12202052 fitness(Output Power) = 10.64447425 Particle 2 :: pos(duty) = 0.12202007 fitness(Output Power) = 10.64447425 Particle 3 :: pos(duty) = 0.12202010 fitness(Output Power) = 10.64447425 Updated best Fitness Position = 0.12202052 Iteration No: 41 c1 = 0.48454827 c2 = 0.75674921velocity = 1.0e-06 * 0 0.3887 0.3605 Particle 1 :: pos(duty) = 0.12202052 fitness(Output Power) = 10.64447425 Particle 2 :: pos(duty) = 0.12202046 fitness(Output Power) = 10.64447425 Particle 3 :: pos(duty) = 0.12202046 fitness(Output Power) = 10.64447425 Updated best Fitness Position = 0.12202052 _____ Iteration No: 42 c1 = 0.41704745 c2 = 0.97178599velocity =

```
0
   0.2178
   0.2021
Particle 1 :: pos(duty) = 0.12202052 fitness(Output Power) = 10.64447425
Particle 2 :: pos(duty) = 0.12202068 fitness(Output Power) = 10.64447425
Particle 3 :: pos(duty) = 0.12202066 fitness(Output Power) = 10.64447425
Updated best Fitness Position = 0.12202052
_____
Iteration No: 43
c1 = 0.98797470 c2 = 0.86414753
velocity =
  1.0e-07 *
   0.5451
   0.5057
Particle 1 :: pos(duty) = 0.12202052 fitness(Output Power) = 10.64447425
Particle 2 :: pos(duty) = 0.12202073 fitness(Output Power) = 10.64447425
Particle 3 :: pos(duty) = 0.12202071 fitness(Output Power) = 10.64447425
Updated best Fitness Position = 0.12202052
_____
Iteration No: 44
c1 = 0.38888378 c2 = 0.45474183
velocity =
  1.0e-07 *
  -0.1129
  -0.1047
Particle 1 :: pos(duty) = 0.12202052 fitness(Output Power) = 10.64447425
Particle 2 :: pos(duty) = 0.12202072
                                     fitness(Output Power) = 10.64447425
Particle 3 :: pos(duty) = 0.12202070 fitness(Output Power) = 10.64447425
Updated best Fitness Position = 0.12202052
_____
Iteration No: 45
c1 = 0.24668720 c2 = 0.78442309
velocity =
```

```
1.0e-07 *
        0
  -0.6859
  -0.6363
Particle 1 :: pos(duty) = 0.12202052 fitness(Output Power) = 10.64447425
Particle 2 :: pos(duty) = 0.12202065 fitness(Output Power) = 10.64447425
Particle 3 :: pos(duty) = 0.12202064 fitness(Output Power) = 10.64447425
Updated best Fitness Position = 0.12202052
Iteration No: 46
c1 = 0.88283761 c2 = 0.91371168
velocity =
  1.0e-07 *
  -0.8255
  -0.7657
Particle 1 :: pos(duty) = 0.12202052 fitness(Output Power) = 10.64447425
Particle 2 :: pos(duty) = 0.12202057 fitness(Output Power) = 10.64447425
Particle 3 :: pos(duty) = 0.12202056 fitness(Output Power) = 10.64447425
Updated best Fitness Position = 0.12202052
Iteration No: 47
c1 = 0.55828492 c2 = 0.59886810
velocity =
  1.0e-07 *
        0
  -0.5312
  -0.4928
Particle 1 :: pos(duty) = 0.12202052 fitness(Output Power) = 10.64447425
Particle 2 :: pos(duty) = 0.12202051
                                      fitness(Output Power) = 10.64447425
Particle 3 :: pos(duty) = 0.12202051 fitness(Output Power) = 10.64447425
Updated best Fitness Position = 0.12202052
_____
Iteration No: 48
c1 = 0.14887672 c2 = 0.89971348
```

```
velocity =
  1.0e-07 *
        0
  -0.2525
  -0.2342
Particle 1 :: pos(duty) = 0.12202052 fitness(Output Power) = 10.64447425
Particle 2 :: pos(duty) = 0.12202049 fitness(Output Power) = 10.64447425
Particle 3 :: pos(duty) = 0.12202049 fitness(Output Power) = 10.64447425
Updated best Fitness Position = 0.12202052
Iteration No: 49
c1 = 0.45039358 c2 = 0.20567234
velocity =
  1.0e-07 *
        0
  -0.1025
  -0.0951
Particle 1 :: pos(duty) = 0.12202052 fitness(Output Power) = 10.64447425
Particle 2 :: pos(duty) = 0.12202048
                                        fitness(Output Power) = 10.64447425
Particle 3 :: pos(duty) = 0.12202048 fitness(Output Power) = 10.64447425
Updated best Fitness Position = 0.12202052
Iteration No: 50
c1 = 0.89965099 c2 = 0.76258554
velocity =
  1.0e-08 *
        0
   0.6817
   0.6324
Particle 1 :: pos(duty) = 0.12202052 fitness(Output Power) = 10.64447425
Particle 2 :: pos(duty) = 0.12202049 fitness(Output Power) = 10.64447425
Particle 3 :: pos(duty) = 0.12202049 fitness(Output Power) = 10.64447425
Updated best Fitness Position = 0.12202052
```

>>