FPT Approximations for Fair k-Min-Sum-Radii

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Guessing Radii from a given k-center solution

Algorithm 1 Very Broad Strokes

Input: k-center solution F_0, largest Radius of k-center solution r_1^*, approximation factor β, k, ϵ
Output: set R of $O(log^k_{1+epsilon}(k/\epsilon))$ radius profiles

1: $//\tilde{r}_1 =$ as the optimal largest radius is within one interval of:
2: $R_1 = \emptyset$
3: $lowerBound = (1+\epsilon)^{j-1} * r_1^*/\beta$
4: append $lowerBound$ to R_1
5: $j = 1$
6: **while** $j < \log_{1+\epsilon}(\beta k)$ and last element of $R_1 < F_0 k$ **do**
7: append $(1+\epsilon)^{j-1}\frac{F_0}{\beta}$ to R_1
8: j++
9: append $F_0 k$ to R_1
10: // R_1 now contains all guesses for the largest radius
11: $j = 2$
12: **for all** r_n in R_1 **do**
13: use r_n as upper bound and $\frac{\epsilon}{k} * r_n$ as lower bound
14: find the rest of the intervals as in line 6-8 and append to R_{1n}
15: repeat for each new radius to calculate profiles $R_{11}...R_{nml...}$, until a depth of k is reached