Algorithm 5 range(Position q, distance r)

```
$v \leftarrow$ getHostPartition($q$)
$R \leftarrow$ rangeSearch($v$'s bucket, $p, r$)
for each door $d_i \in P2D_{\sqsubset}(v)$ do
    $r_1 \leftarrow r - dist_V(q, d_i)$
    for $j$ from 1 to $|\mathcal{S}_{door}|$ do
        $d_j \leftarrow M_{idx}[d_i, j]$
        if $M_{d2d}[d_i, d_j] > r_1$ then
            break
        else
            $r_2 \leftarrow r_1 - M_{d2d}[d_i, d_j]$
            if DPT$[d_j].vPtr_1 \neq null$ then
                if DPT$[d_j].dist_1 \leq r_2$ then
                    add objects in DPT$[d_j].vPtr_1$'s bucket to $R$
                else
                    $R \leftarrow R \cup$ rangeSearch(DPT$[d_j].vPtr_1, d_j, r_2$)
            if DPT$[d_j].vPtr_2 \neq null$ then
                if DPT$[d_j].dist_2 \leq r_2$ then
                    add objects in DPT$[d_j].vPtr_2$'s bucket to $R$
                else
                    $R \leftarrow R \cup$ rangeSearch(DPT$[d_j].vPtr_2, d_j, r_2$)
return $R$
```