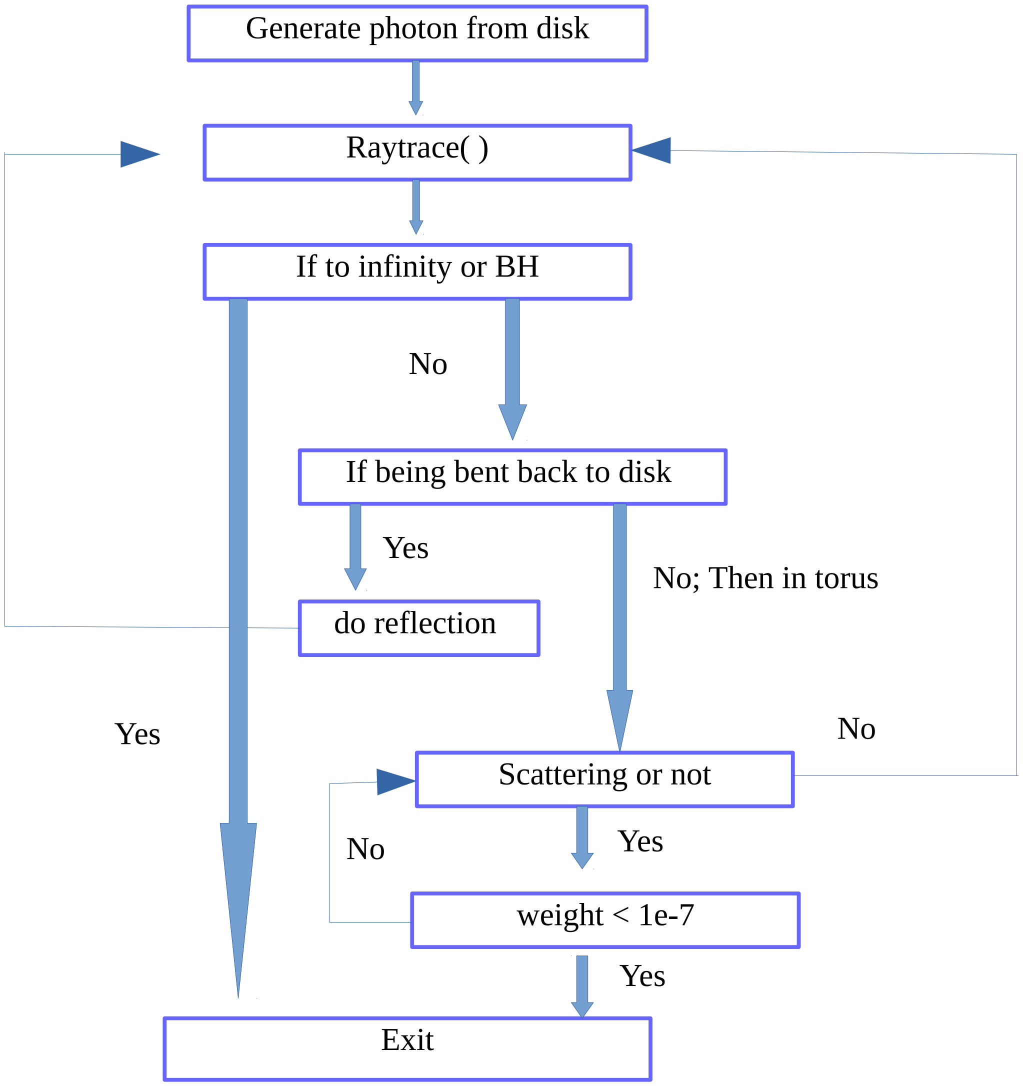
Generate photon from disk
Raytrace( )
If to infinity or BH
No
If being bent back to disk
Yes
No; Then in torus
do reflection
Yes
No
Scattering or not
No
Yes
weight < 1e-7
Yes
Exit

```
do{// loop1

    do{// loop2
        raytrace_out_torus(position, momentum, energy, i_path);
                        if(i_path=3, going to BH) then jump out of loop1
                        if(i_path=0, going to infinity) then jump out of loop1
                        if(i_path=1, going to disk){ // this is the reflection
                            reflection() // do reflection;
                        }
                        if(i_path=2, going inside torus) then go to loop3

     }//loop2

    do{// loop3:  for possible multi-scattering in the torus
        raytrace_in_torus(position, momentum, energy, weight);
             if(no scattering in torus) then jump out of loop3 and go to loop2
             if(scattering at least for one time) then keep stay in loop3.

    }//loop3

}//loop1
```

Notes:

1. raytrace_out_torus(): // raytrace for photon in vacuum, including reflection
   input: position, momentum, energy
   output: i_path, a flag which tells the possible path before going to infinity:
   (1) i_path=0, i.e, go to infinity, give position and energy at the infinity;
   (2) i_path=1, i.e, back to disk, give position, momentum and energy before illuminating disk
   (3) i_path=2, i.e, go to torus, give position, momentum and energy when just going inside torus
   (4) i_path=3, i.e, go to BH, ignore this photon

2. reflection() : disk reflection function (to be done soon)

3. raytrace_in_torus(): // raytrace for photon in torus, including scattering
   input: position, momentum, energy, weight
   output: if this function return 0: Scattering happens when photon travels through torus. This function can give the scattering position, and (momentum, energy, weight) after scattering
   1: No scattering happens when photon travels through torus. This function can give position of escaping torus, and corresponding momentum, energy, weight

4. The code can output three spectrum file: (1) Novikov-Thorne disk spectrum
(2) disk reflection spectrum
(3) Comptonized spectrum from the torus
according to each photon's trajectory.