CPSC 314
Theory Assignment 4
Due Tuesday, December 01 at 23:59

Submit your answers on the corresponding assignment on canvas

Given the following data:

ray origin [-70,20,0]
ray direction [1,0,0]

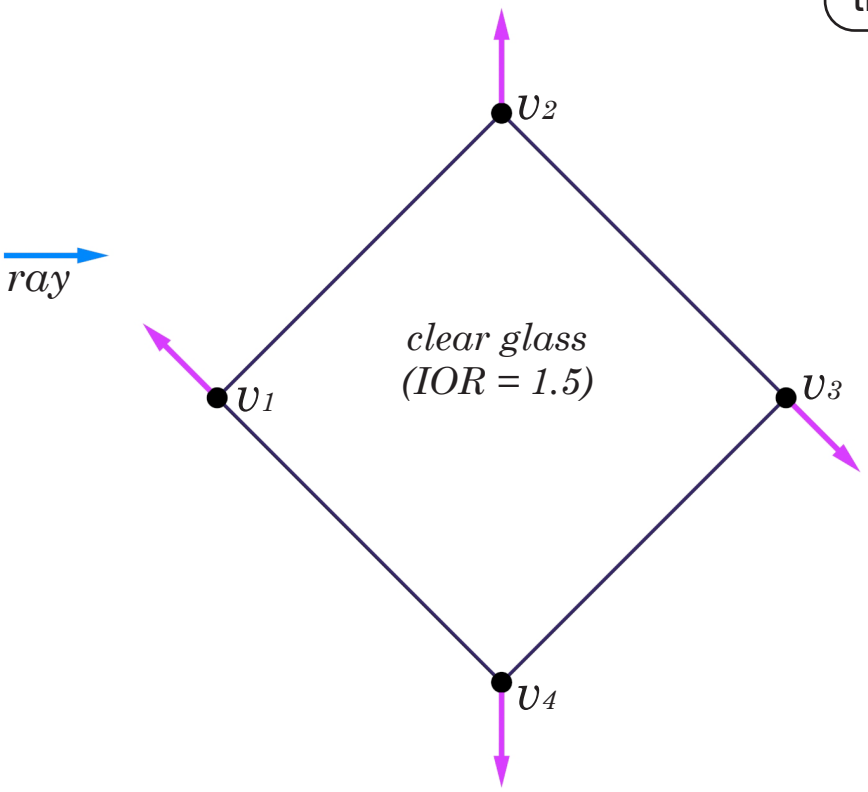
	Coordinates xyz	normal
v_1	[-40,0,0]	[cos(135),sin(135),0]
v_2	[0,40,0]	[0,1,0]
v_3	[40,0,0]	[cos(315),sin(315),0]
v_4	[0,-40,0]	[0,-1,0]

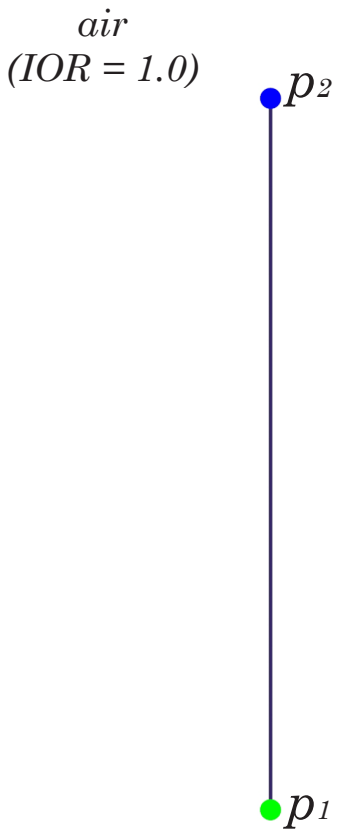
	Coordinates xyz	Color
p_1	[90, -60,0]	[0,255,0]
p_2	[90, 30,0]	[0,0,255]

a) (20pts) Compute the first intersection of the primary ray with the glass object. (position and interpolated normal)

b) (30pts) Compute the secondary refraction rays (coming in and out from the glass object)

c) (50pts) Compute the final color sampled by the ray. (interpolating the color between p1 and p2 (if the ray intersects that segment)





Bonus 1

Submit your answers on the corresponding assignment on canvas

Given the following data:

ray origin [-60,40,0]
ray direction [0.939693,-0.34202,0]

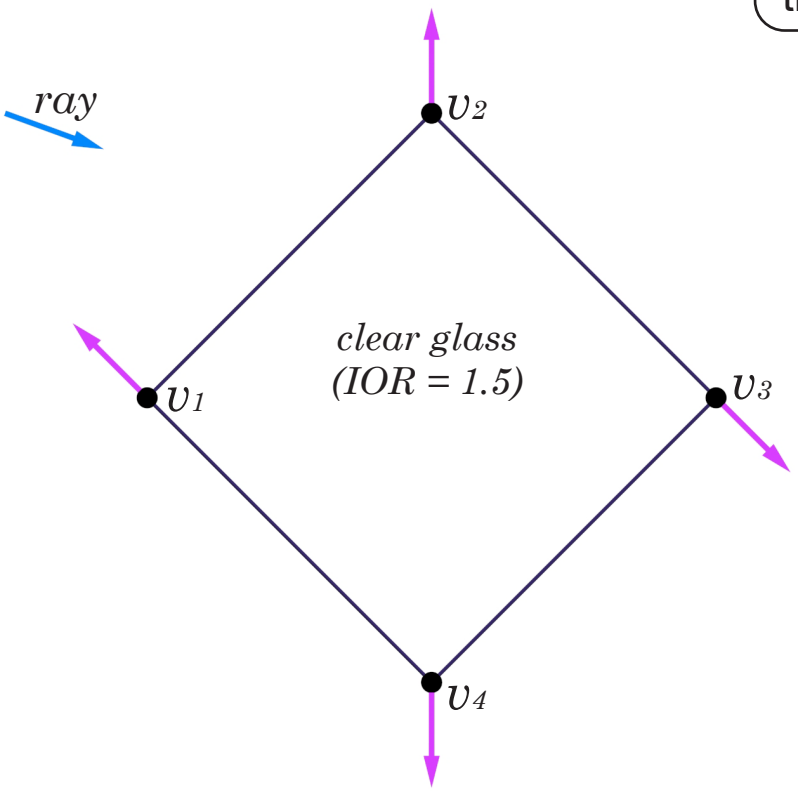
	Coordinates xyz	normal
v_1	[-40,0,0]	[cos(135),sin(135),0]
v_2	[0,40,0]	[0,1,0]
v_3	[40,0,0]	[cos(315),sin(315),0]
v_4	[0,-40,0]	[0,-1,0]

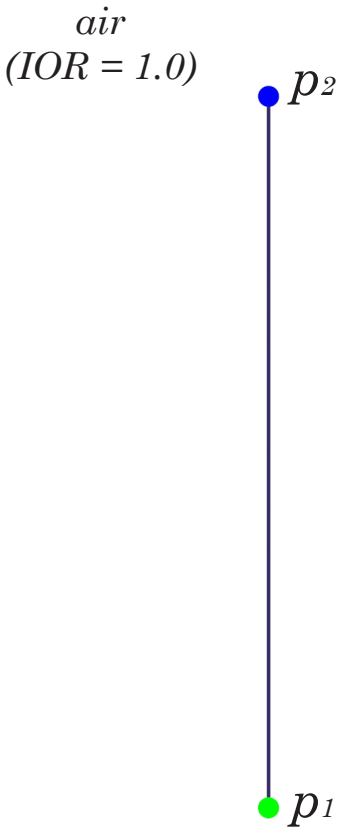
	Coordinates xyz	Color
p_1	[90, -70,0]	[0,255,0]
p_2	[90, 30,0]	[0,0,255]

a) (20pts) Compute the first intersection of the primary ray with the glass object. (position and interpolated normal)

b) (30pts) Compute the secondary refraction rays (coming in and out from the glass object)

c) (50pts) Compute the final color sampled by the ray. (interpolating the color between p1 and p2 (if the ray intersects that segment)





Bonus 2

Submit your answers on the corresponding assignment on canvas

Given the following data:

ray origin	[-31.7668,27.1443,0]
ray direction	[0.984808,0.173648,0]

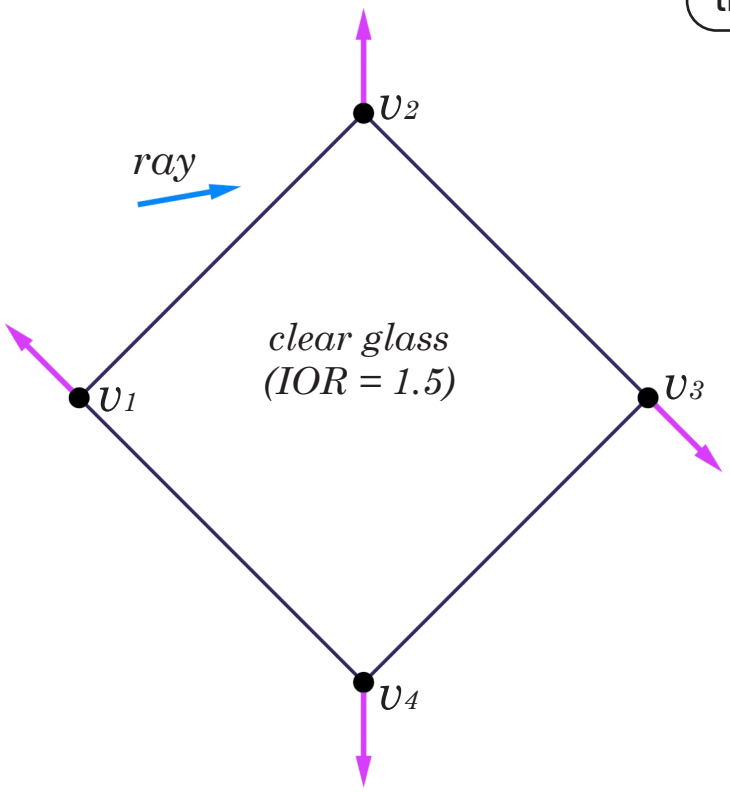
	Coordinates xyz	normal
v_1	[-40,0,0]	[cos(135),sin(135),0]
v_2	[0,40,0]	[0,1,0]
v_3	[40,0,0]	[cos(315),sin(315),0]
v_4	[0,-40,0]	[0,-1,0]

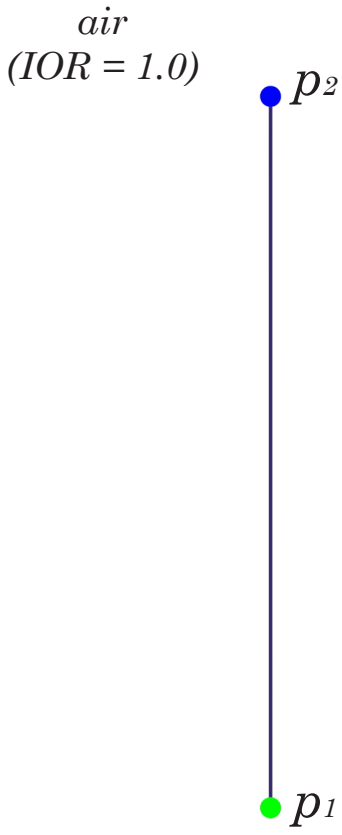
	Coordinates xyz	Color
p_1	[90, -70,0]	[0,255,0]
p_2	[90, 30,0]	[0,0,255]

a) (20pts) Compute the first intersection of the primary ray with the glass object. (position and interpolated normal)

b) (30pts) Compute the secondary refraction rays (coming in and out from the glass object)

c) (50pts) Compute the final color sampled by the ray. (interpolating the color between p1 and p2 (if the ray intersects that segment)





Bonus 3

Submit your answers on the corresponding assignment on canvas

Given the following data:

ray origin [-31.7668,27.1443,0]
ray direction [0.984808,0.173648,0]

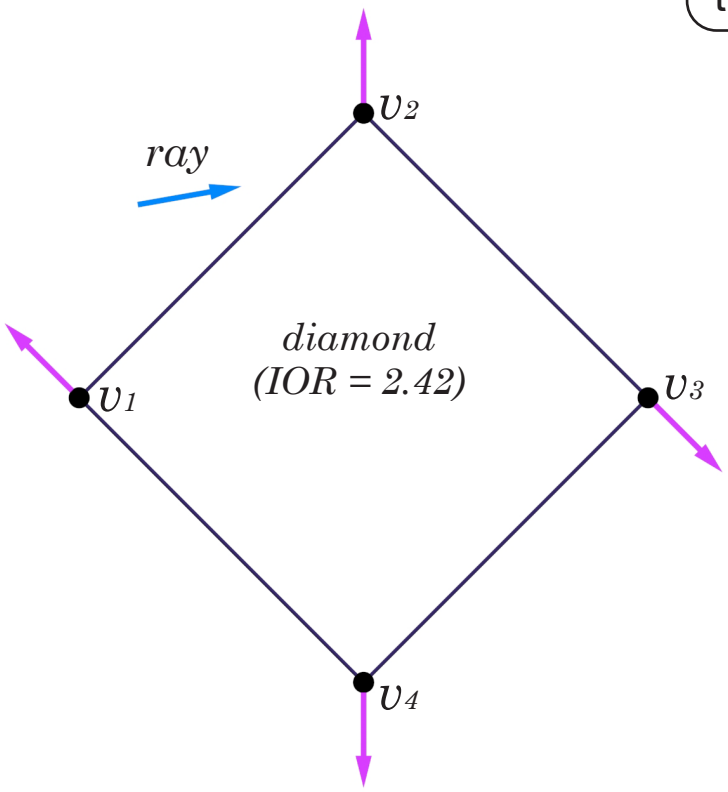
	Coordinates xyz	normal
v_1	[-40,0,0]	[cos(135),sin(135),0]
v_2	[0,40,0]	[0,1,0]
v_3	[40,0,0]	[cos(315),sin(315),0]
v_4	[0,-40,0]	[0,-1,0]

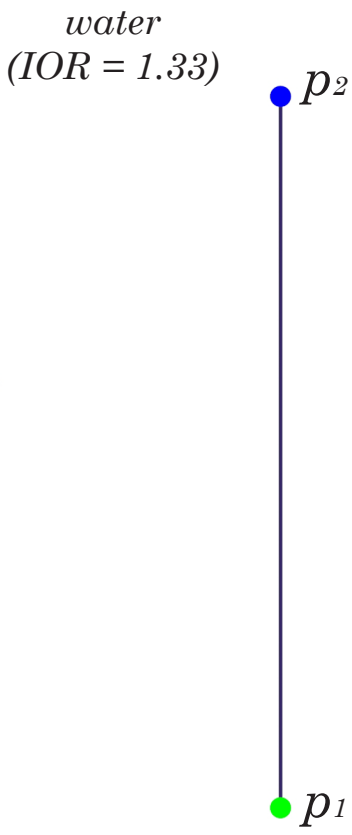
	Coordinates xyz	Color
p_1	[90, -70,0]	[0,255,0]
p_2	[90, 30,0]	[0,0,255]

a) (20pts) Compute the first intersection of the primary ray with the glass object. (position and interpolated normal)

b) (30pts) Compute the secondary refraction rays (coming in and out from the glass object)

c) (50pts) Compute the final color sampled by the ray. (interpolating the color between p1 and p2 (if the ray intersects that segment)





Bonus 4

Submit your answers on the corresponding assignment on canvas

Given the following data:

ray origin [-44.1182,30.7795,0]
ray direction [0.642788,-0.766044,0]

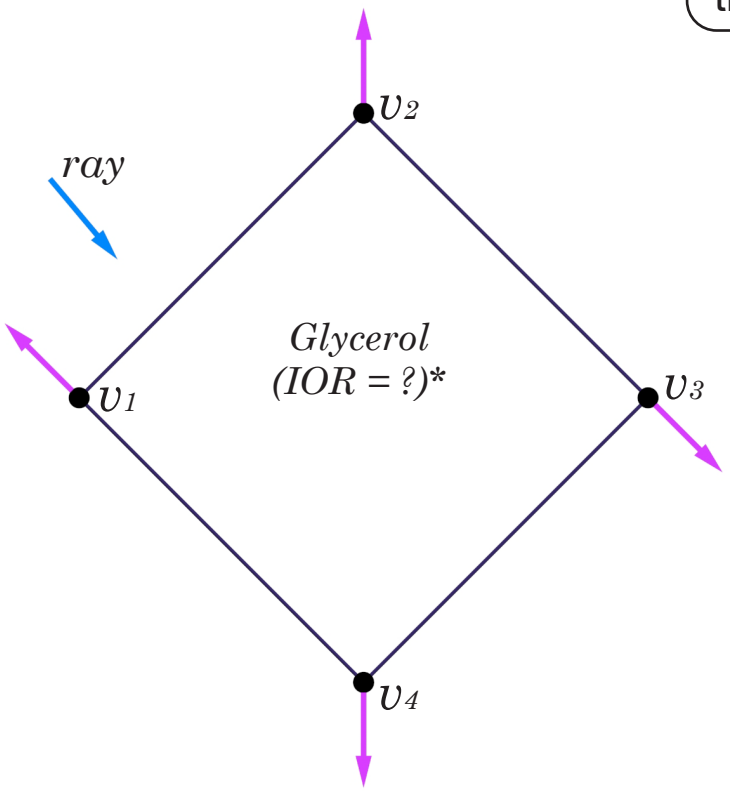
	Coordinates xyz	normal
v_1	[-40,0,0]	[cos(135),sin(135),0]
v_2	[0,40,0]	[0,1,0]
v_3	[40,0,0]	[cos(315),sin(315),0]
v_4	[0,-40,0]	[0,-1,0]

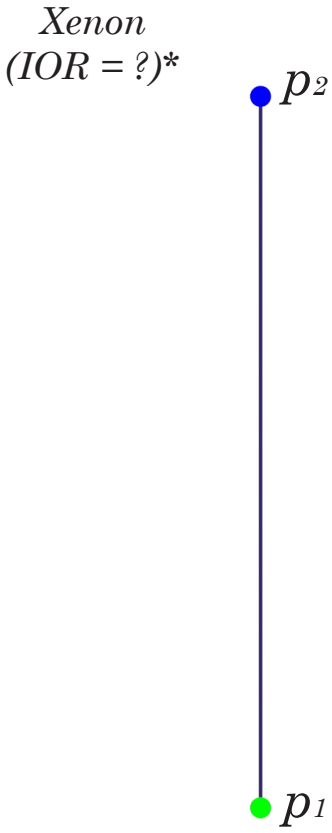
	Coordinates xyz	Color
p_1	[90, -70,0]	[0,255,0]
p_2	[90, 30,0]	[0,0,255]

a) (20pts) Compute the first intersection of the primary ray with the glass object. (position and interpolated normal)

b) (30pts) Compute the secondary refraction rays (coming in and out from the glass object)

c) (50pts) Compute the final color sampled by the ray. (interpolating the color between p1 and p2 (if the ray intersects that segment)





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