CSE-4303 CSE5365 Computer Graphics
Practice Parallel Projections

The viewing parameters for a parallel projection are given as

VRP(WC)=(3,4,5)	VPN(WC)=(8,6,12)
VUP(WC)=(1,2,3)	PRP (VRC)=(2,5,-5)
u_{min} (VRC) = -4	u_{max} (VRC) = 6
v_{min} (VRC) = 24	v_{max} (VRC) = 26
n_{min} (VRC) = 10	n_{max} (VRC) = 20

Find the sequence of transformations that will map this viewing volume into a volume bounded by the planes : x=-1 ; x=1 ; y=-1 ; y=1 ; z=0; z=1

Hint: The **Direction of Projection (DOP)** is calculated as DOP=CW−PRP, where **CW** is the Center of the Window on the View Plane.

Matrix #2: Rx

1.000	0.000	0.000	0.000
0.000	0.894	-0.447	0.000
0.000	0.447	0.894	0.000
0.000	0.000	0.000	1.000

Matrix #1: Translate

1.000	0.000	0.000	-3.000
0.000	1.000	0.000	-4.000
0.000	0.000	1.000	-5.000
0.000	0.000	0.000	1.000

Matrix #4: Rz

0.417	0.909	0.000	0.000
-0.909	0.417	0.000	0.000
0.000	0.000	1.000	0.000
0.000	0.000	0.000	1.000

Matrix #3: Ry

0.859	0.000	-0.512	0.000
0.000	1.000	0.000	0.000
0.512	0.000	0.859	0.000
0.000	0.000	0.000	1.000

Matrix #6: Translate

Matrix #5: Shear

Matrix #7: Scale

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The viewing parameters for a parallel projection are given as

VRP(WC)=(0,0,0) VPN(WC)=(0, 0,1)
VUP(WC)=(0,1,0) PRP (VRC)=(4,7,10)
u_{min} (VRC) = 6 u_{max} (VRC) = 11
v_{min} (VRC) = -3 v_{max} (VRC) = 5
n_{min} (VRC) = 12 n_{max} (VRC) = 20

Find the sequence of transformations that will map this viewing volume into a volume bounded by the planes : x=-1 ; x=1 ; y=-1 ; y=1 ; z=0; z=1

Hint: The **Direction of Projection (DOP)** is calculated as DOP=CW−PRP, where **CW** is the Center of the Window on the View Plane.

Matrix #2: Rx

1	0	0	0
0	1	0	0
0	0	1	0
0	0	0	1

Matrix #1: Translate

1	0	0	0
0	1	0	0
0	0	1	0
0	0	0	1

Matrix #4: Rz

1	0	0	0
0	1	0	0
0	0	1	0
0	0	0	1

Matrix #3: Ry

1	0	0	0
0	1	0	0
0	0	1	0
0	0	0	1

Matrix #6: Shear

Matrix #5: Shear

Matrix #8: Scale

Matrix #7: translate

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The viewing parameters for a parallel projection are given as

VRP(WC)=(3,4,5) VPN(WC)=(8,6,12)
VUP(WC)=(1,2,3) PRP (VRC)=(2,5,5)
u_{min} (VRC) = -4 u_{max} (VRC) = 6
v_{min} (VRC) = 8 v_{max} (VRC) = 12
n_{min} (VRC) = 3 n_{max} (VRC) = 5

Find the sequence of transformations that will map this viewing volume into a volume bounded by the planes : x=-1 ; x=1 ; y=-1 ; y=1 ; z=0; z=1

Hint: The **Direction of Projection (DOP)** is calculated as DOP=CW−PRP, where **CW** is the Center of the Window on the View Plane.

Matrix #2: Rx

1.000	0.000	0.000	0.000
0.000	0.894	-0.447	0.000
0.000	0.447	0.894	0.000
0.000	0.000	0.000	1.000

Matrix #1: Translate

1.000	0.000	0.000	-3.000
0.000	1.000	0.000	-4.000
0.000	0.000	1.000	-5.000
0.000	0.000	0.000	1.000

Matrix #4: Rz

0.417	0.909	0.000	0.000
-0.909	0.417	0.000	0.000
0.000	0.000	1.000	0.000
0.000	0.000	0.000	1.000

Matrix #3: Ry

0.859	0.000	-0.512	0.000
0.000	1.000	0.000	0.000
0.512	0.000	0.859	0.000
0.000	0.000	0.000	1.000

Matrix #6: Shear

Matrix #5: Shear

Matrix #8: Scale

Matrix #7: Translate

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The viewing parameters for a parallel projection are given as

VRP(WC)=(3,4,5)	VPN(WC)=(8,6,12)
VUP(WC)=(1,2,3)	PRP (VRC)=(5,2,1)
u_{min} (VRC) = 2	u_{max} (VRC) = 6
v_{min} (VRC) = 16	v_{max} (VRC) = 24
n_{min} (VRC) = 15	n_{max} (VRC) = 20

Find the sequence of transformations that will map this viewing volume into a volume bounded by the planes : x=-1 ; x=1 ; y=-1 ; y=1 ; z=0; z=1

Hint: The **Direction of Projection (DOP)** is calculated as DOP=CW−PRP, where **CW** is the Center of the Window on the View Plane.

Matrix #2: Rx

1.000	0.000	0.000	0.000
0.000	0.894	-0.447	0.000
0.000	0.447	0.894	0.000
0.000	0.000	0.000	1.000

Matrix #1: Translate

1.000	0.000	0.000	-3.000
0.000	1.000	0.000	-4.000
0.000	0.000	1.000	-5.000
0.000	0.000	0.000	1.000

Matrix #4: Rz

0.417	0.909	0.000	0.000
-0.909	0.417	0.000	0.000
0.000	0.000	1.000	0.000
0.000	0.000	0.000	1.000

Matrix #3: Ry

0.859	0.000	-0.512	0.000
0.000	1.000	0.000	0.000
0.512	0.000	0.859	0.000
0.000	0.000	0.000	1.000

Matrix #6: Translate

Matrix #5: Shear

Matrix #7: Scale

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1. The viewing parameters for a parallel projection are given as

VRP(WC)=(1,3,4) **VPN(WC)=(6,0,8)**
VUP(WC)=(10,0,0) **PRP (VRC)=(0,4,5)**
u_{min} **(VRC) = 13** u_{max} **(VRC) = 17**
v_{min} **(VRC) = -7** v_{max} **(VRC) = 3**
n_{min} **(VRC) = 12** n_{max} **(VRC) = 14**

Find the sequence of transformations that will map this viewing volume into a volume bounded by the planes : x=-1 ; x=1 ; y=-1 ; y=1 ; z=0; z=1

Hint: The **Direction of Projection (DOP)** is calculated as DOP=CW−PRP, where **CW** is the

Matrix #2: Rx

Matrix #1: Translate

Matrix #4: Rz

Matrix #3: Ry

Matrix #6: Shear

Matrix #5: Shear

Matrix #8: Scale

Matrix #7: Translate

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The viewing parameters for a parallel projection are given as:

VRP(WC)=**(0,0,0)** VPN(WC)=(**0, 0,1**)
VUP(WC)=**(0,1,0)** PRP (VRC)=(**10,20,50**)
u_{min} (VRC) = **-6** u_{max} (VRC) = **-2**
v_{min} (VRC) = **-2** v_{max} (VRC) = **6**
n_{min} (VRC) = **-4** n_{max} (VRC) = **1**

Find the sequence of transformations that will map this viewing volume into a volume bounded by the planes : x=-1 ; x=1 ; y=-1 ; y=1 ; z=0; z=1

Hint: The **Direction of Projection (DOP)** is calculated as DOP=CW−PRP, where **CW** is the Center of the Window on the View Plane.

Matrix #1: Translate

1	0	0	0
0	1	0	0
0	0	1	0
0	0	0	1

Matrix #2: Rx

1	0	0	0
0	1	0	0
0	0	1	0
0	0	0	1

Matrix #3: Ry

1	0	0	0
0	1	0	0
0	0	1	0
0	0	0	1

Matrix #4: Rz

1	0	0	0
0	1	0	0
0	0	1	0
0	0	0	1

Matrix #5: Shear

Matrix #6: Translate

Matrix #7: Scale

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The viewing parameters for a parallel projection are given as

VRP(WC)=(0,0,0)	VPN(WC)=(0, 0,1)
VUP(WC)=(0,1,0)	PRP (VRC)=(4,5,10)
u_{min} (VRC) = 1	u_{max} (VRC) = 5
v_{min} (VRC) = -6	v_{max} (VRC) = 2
n_{min} (VRC) = 30	n_{max} (VRC) = 40

Find the sequence of transformations that will map this viewing volume into a volume bounded by the planes : x=-1 ; x=1 ; y=-1 ; y=1 ; z=0; z=1

Hint: The **Direction of Projection (DOP)** is calculated as DOP=CW−PRP, where **CW** is the Center of the Window on the View Plane.

Matrix #2: Rx

1	0	0	0
0	1	0	0
0	0	1	0
0	0	0	1

Matrix #1: Translate

1	0	0	0
0	1	0	0
0	0	1	0
0	0	0	1

Matrix #4: Rz

1	0	0	0
0	1	0	0
0	0	1	0
0	0	0	1

Matrix #3: Ry

1	0	0	0
0	1	0	0
0	0	1	0
0	0	0	1

Matrix #6

Matrix #5:

Matrix #7

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The viewing parameters for a parallel projection are given as

VRP(WC)=(0,0,0) **VPN(WC)=(0, 2, 0)**

VUP(WC)=(0,1,2) **PRP (VRC)=(12,25,60)**

u_{min} (VRC) = -13 **u_{max} (VRC) = -17**

v_{min} (VRC) = -7 **v_{max} (VRC) = 9**

n_{min} (VRC) = 58 **n_{max} (VRC) = 62**

Find the sequence of transformations that will map this viewing volume into a volume bounded by the planes : x=-1 ; x=1 ; y=-1 ; y=1 ; z=0; z=1

Hint: The **Direction of Projection (DOP)** is calculated as DOP=CW−PRP, where **CW** is the Center of the Window on the View Plane.

Show the matrices for Problem 2

Matrix #2: Rx

Matrix #1: Translate

Matrix #4: Rz

Matrix #3: Ry

Matrix #6: Shear

Matrix #5: Shear

Matrix #8: Scale

Matrix #7: Translate
