



Mahindra
École Centrale
COLLEGE OF ENGINEERING

CS 101 Introduction to Computing

Semester – 2014 -15 / II Semester

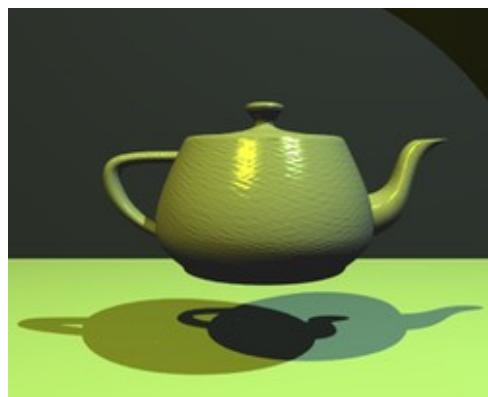
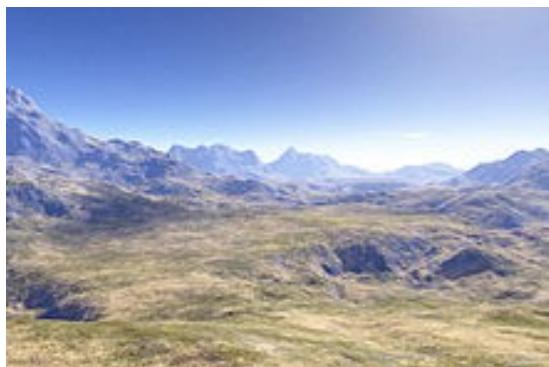
Units – 2 – 0 – 2 – 3

Pre-requisite – None

Instructors – Sanjay Dhande, Arya Bhattacharyya,
Lilian Besson, Vipin K

Tutors – Arya, Lilian, Vipin, Vivek, Kondiah

Computer Graphics & Animation Systems



- Vector Graphics & Raster Graphics
- Color Graphics, B & W Graphics
- Graphics Programming
- Graphics Engine
- Geometric modeling in graphics



Motion Control & Robotics



- Stepper Motors and Drives
- NC, CNC Drives
- NC, CNC Programming
- Pick, Place operations
- Machine Tools, AGVs, Robots
- Drive controllers
- FANUC controller
- NUMERIQUE controllers

Homework Problems

- Consider a 2-D Cartesian coordinate work space of $(-100, 100)$ to $(100, 100)$
- Input a point $P(x, y)$ and check if it is IN, ON or OUT of WS
- Input two points P and Q and check if a point A is on RIGHT, LEFT or ON the line PQ
- Circle problem, Triangle problem
- Given K , calculate the sum of the first K odd integers

Homework Problem # 1

- Consider a 2-D Cartesian coordinate work space (WS) of (x_{\min}, x_{\max}) to (y_{\min}, y_{\max})
- Input a point P (x, y) and check if it is IN, or OUT of WS
- $(x_{\min} < x)$ and $(x_{\max} > x)$
- $(y_{\min} < y)$ and $(y_{\max} > y)$
- Use logical operations for checking
- Write a pseudo-code

Homework Problem # 2

- Consider a 2-D Cartesian coordinate work space (WS) of (x_{\min}, x_{\max}) to (y_{\min}, y_{\max})
- Input point P (x_1, y_1) and Q (x_2, y_2) . Check if P and Q are in WS
- Input A (x, y)
- Considering a line from P to Q, check if A is on RIGHT or LEFT or ON the line PQ
- Write a pseudo-code

Homework Problem # 3

- Consider a 2-D Cartesian coordinate work space (WS) of (x_{\min}, x_{\max}) to (y_{\min}, y_{\max})
- Input point O (x_c, y_c) and r –radius of a circle with O as the center.
- Input a point A (x, y)
- Check if A is INSIDE the circle or OUTSIDE the circle or ON the circle
- Write a pseudo-code

Homework Problem # 4

- Consider a 2-D Cartesian coordinate work space (WS) of (x_{\min}, x_{\max}) to (y_{\min}, y_{\max})
- Input three vertex points of a triangle A $(-x, -y)$, B $(x, -y)$ and C $(0, y)$.
- Input a point P (x_1, y_1)
- Check if P is INSIDE the triangle or OUTSIDE the triangle or ON the periphery of the triangle
- Write a pseudo-code

Homework Problem # 5

- Input an integer K
- Enumerate and print the first K odd integers.
- For example, if $K = 5$, the answer will be 1, 3, 5, 7, 9
- Write a pseudo-code

Concepts of Structured Programming

- All algorithms will have one entry and one exit point
- All steps can be grouped in the form of constructs in an algorithm
- There are some basic constructs
- Any group or block of instructions will consist of only these constructs
- Repetitive instructions can be designed as subroutines



Construct – Sequence of Statements

- begin
 S1;
 S2;

 Sn
- end
- Left side is always a variable in S
- Right hand side will be an expression in S



Construct – Conditional statement

- Begin
 - if B then S1
 - else S2
- End
- B is a condition outcome of which is TRUE or FALSE
- S1 is executed if B is TRUE
- S2 is executed if B is FALSE

Construct – Repetition statement

- While B do
 begin
 S
 end
- B is a condition outcome of which is TRUE or FALSE
- S is executed if B is true and the loop is repeated
- If B is FALSE, the execution comes out



Construct – Input / Read statement

- While B do
 begin
 S
 end
- B is a condition outcome of which is TRUE or FALSE
- S is executed if B is true and the loop is repeated
- If B is FALSE, the execution comes out





Construct – Output / Write statement

- While B do
 begin
 S
 end
- B is a condition outcome of which is TRUE or FALSE
- S is executed if B is true and the loop is repeated
- If B is FALSE, the execution comes out





What is Structured Programming ?

Structured programming is a programming paradigm aimed at improving the clarity, quality, and development time of a computer program by making extensive use of subroutines, block structures and basic constructs



Thank You!

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