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
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
Consider a 2-D Cartesian coordinate work space (WS) of \((x_{\text{min}}, x_{\text{max}})\) to \((y_{\text{min}}, y_{\text{max}})\)

- 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
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
Consider a 2-D Cartesian coordinate work space (WS) of \((x_{\text{min}}, x_{\text{max}})\) to \((y_{\text{min}}, y_{\text{max}})\)

- 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
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
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
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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