

COSC2406 F18 – Assembly Language Programming

Assignment 7 - Chapters 12

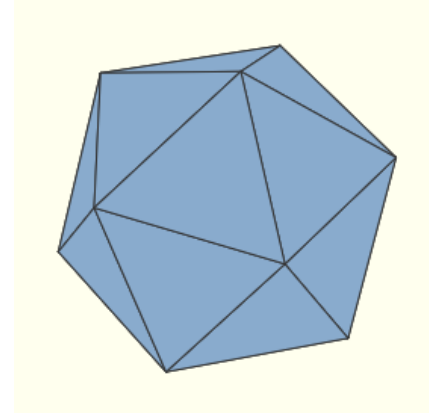
For each of these programs, show that the FPU is empty before exiting by printing the FPU Stack.

Due: Sunday November 25th, 2018 by 11:55pm

Q1 [20] Volume and Area of a Regular Icosahedron

An icosahedron is a regular polyhedron with 20 congruent equilateral triangular faces. Ask the user to supply the length of one of the edges (one side of a triangular face) and then calculate the total surface area and volume of the icosahedron. Report the answers and then repeat. Your program should loop until the value 0 is entered for the radius – and then it should promptly exit. Only positive numbers are allowed for the length of the edge. If a negative value is entered, an appropriate message should be displayed indicating that the value is invalid and the FPU should be made empty before looping again.

$$\begin{aligned}\text{Area} &= 5\sqrt{3} * e^2 \\ \text{Volume} &= \frac{5}{12} (3 + \sqrt{5}) * e^3\end{aligned}$$



Q2 [20] Evaluating Floating-Point Expressions

Write a program that collects five floating point values from the user and stores them in variables. Then evaluate each of the following expressions:

- a) $((A-B) * C) / ((D + C) - E)$
- b) $(D + E) / \sqrt{A * (B - C)}$
- c) $\sqrt{E * A} / (B/D - C)^2$

At least one of these equations must be calculated in a procedure (called by main) which accepts all the parameters by stack, none of the parameters are to be named, and the answer is returned in the eax register. Main will push the parameters onto the stack, call the procedure, and finally print the returned answer.

For all the problems, a right-side column of comments must be included to explain the logic of your code. Writing the logic in Java or pseudo-code is acceptable. When I read your comments, I should clearly see your algorithm. Also, there must be proper comments at the start of every procedure as shown on pages 146-47, and comments with your name, course code, date, assignment/question number, and problem description at the top of every program. Marks will be deducted for missing commenting. *Failure to comment the code properly or to format like the code in the textbook will result in a penalty of up to 25%.*

Demonstrate and explain your working programs to the TA, Glenn Driver (gdriver@algomau.ca) by Thursday Nov 29th. The demonstration and explanation of your code will represent 25% of the

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assignment grade – the other 75% of the grade will come from grading the code and how well the programs meet the specification and requirements of the question.

IMPORTANT:

- a) *If you do not demonstrate your programs to the TA by the end of the demonstration date, you will receive a grade of zero.*
- b) *If you are unable to explain most or all of your code and the logic of your programs, then the maximum grade possible will be 50%.*