CS111 Introduction to Computers

Programming Sheet 2

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1) **Evaluate the following expressions:**

7 / 22
22 / 7
7 % 22
22 % 7

2) **Write the following as a valid C arithmetic expression**

$X = a + \dfrac{b}{c}$

$y = (\dfrac{a + b}{2}) * 0.324$

$z = 1 + \dfrac{3}{a + b} - d$

3) **Evaluate the following:**

floor (15.8)
floor (15.8 + 0.5)
ceil (- 7.2) * pow (4.0, 2.0)
sqrt (floor (fabs (-16.8)))
log10 (1000.0)

4) A Manufacturer wishes to determine the cost of producing an open-top cylindrical container. The surface area of the container is the sum of the area of the circular base plus the area of the outside (the circumference of the base times the length of the container). **Write a program** to take the radius of the base, the height of the container, and the cost per square cm of the material. Calculate and display the cost of each cylindrical container.

5) Write a program that asks a student for his grade (out of 100) in 3 exams and then print out his final grade (out of 100), given that the weight of the first exam is 30%, the second 30%, and the third 40% .

6) **Write a computer program that computes the duration of a projectile's flight and its height when it reaches the target.**

Program Constant:

g   32.17   /* Gravitional constant */

Program inputs

double	theta	/* angle of elevation */
double	distance	/* distance to target */
double	velocity	/* projectile velocity in ft/sec */

Program outputs

double	time	/* time of flight */
double	height	/* height at impact */

Relevant Formulas

$$Time = \frac{Distance}{velocity \times cos(theta)}$$

$$Height = velocity \times sin(theta) \times time - \frac{g \times time^2}{2}$$

Try your program with inputs: angle : 0.3 radians, velocity 800 ft/sec, and distance 11000 feet.