ECS 30A

Fall 2008

Due:Monday, October 20.Written:4:00pm in 2131 Kemper.Programs:11:59pm using handin to cs30a, p2 directory.Filenames:car.c, projectile.c, round.c earth.c, music.c, compass.c, gas.c, boiling.c

Written: p. 140: 1, 2, 3, 4, 5. p.202: 5, 6

Programming: All programs should be able to compile with no warnings when compiled with the –Wall option. You should put your name(s) in a comment on the first line of each file. The prompts and output format of each program must match the following examples exactly. The actual values calculated by the programs may vary slightly from the examples. To use functions from math.h, you must have –Im on your compile line (that is an "I" as in library) to link with the math library, e.g., gcc –Wall –Im car.c.

#1. (p. 140) Filename: car.c

[...@pc...]\$ car.out
Please enter the principal, and interest> 10000 18
Please enter the number of payments> 36
Your loan of \$10000.00 will have monthly payments of \$361.52.
[...@pc...]\$

#4 (p. 141) Filename: projectile.c

[...@pc...]\$ projectile.out This program computes the duration of a projectile's flight, and its height above the ground when it reaches the target. The program will ask you for the angle of elevation (in radians), the distance to the target (in feet), and the project velocity (in feet per second).

Please enter the angle, distance, velocity> 0.3 11000 800 The projectile will take 14.393 seconds to reach the target. The projectile will hit the target at a height of 70.6 feet. [...@pc...]\$

#5 (p. 142) Filename: round.c

This can be done without calling any functions.

[...@pc...]\$ round.out
Please enter a positive number> 32.4851
That rounded is 32.4900
[...@pc...]\$

#10 (p. 143) Filename earth.c

celsius should be an int, and Fahrenheit should be a double.

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[...@pc...]$ earth.out
Please enter a depth (in kilometers)> 25.9
The temperature at that depth is 278 Celsius, or 532.4 Fahrenheit.
[...@pc...]$
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#1. p 203 Filename: music.c

You should write this program without using an "else".

The tricky part of this program is the need to transform the money into ints to guarantee correct arithmetic of the displayed tax and discount with the total purchases. You should convert the double purchases to an int containing the corresponding value in terms of cents. Note that rounding errors cause 100×24.90 to become 2489 when storing in an int! You will need to add 0.1 to overcome the rounding problem, e.g. $100 \times 24.90 + 0.1$ becomes 2490.

[...@pc...]\$ music.out Please enter your total purchases> 122.00 Are you a teacher (0 = No, 1 = Yes) > 0Total purchases \$122.00 Sales tax (5%) 6.10 \$128.10 Total [...@pc...]\$ music.out Please enter your total purchases> 122.00 Are you a teacher (0 = No, 1 = Yes) > 1Total purchases \$122.00 Teacher's discount (12%) 14.64 Discounted total 107.36 Sales tax (5%) 5.37 Total \$112.73 [...@pc...]\$ #3, p. 204 Filename: compass.c North is 0°, East is 90°, South is 180°, and West is 270°. [...@pc...]\$ compass.out Please enter a heading in degrees (0-360.0)> 23.3 That is North 23.3 East. [...@pc...]\$ compass.out Please enter a heading in degrees (0-360.0)> 110.0 That is South 70.0 East. [...@pc...]\$ compass.out Please enter a heading in degrees (0-360.0)> 370 Your heading is outside the allowed values. Please try again. [...@pc...]\$ #4. p. 204 Filename: gas.c You must use a switch statement. [...@pc...]\$ gas.out Please enter the first letter of the cylinder's color> O Contents is ammonia. [...@pc...]\$ gas.out Please enter the first letter of the cylinder's color> y Contents is hydrogen. [...@pc...]\$ gas.out Please enter the first letter of the cylinder's color> B Contents is carbon monoxide. [...@pc...]\$

#11. p.207 Filename: boiling.c

[...@pc...]\$ boiling.out Please enter the boiling point of the substance> 103 Substance is water. [...@pc...]\$ boiling.out Please enter the boiling point of the substance> 1200 Substance is copper. [...@pc...]\$ boiling.out Please enter the boiling point of the substance> 2500 Substance unknown. [...@pc...]\$