

CprE 185: Intro to Problem Solving (using C)
Midterm 1: Wednesday Sep 19, 2012

Student Name:

Student ID Number:

Lab Section (circle one): Mon 4-6, Mon 6-8, Tue 12-2, Tue 2-4, Wed 10-12

1. True/False Questions (10 x 1p each = 10p)

- (a) I forgot to write down my name and student ID number. TRUE / FALSE
- (b) The C language was derived from another language called B TRUE / FALSE
- (c) All C functions must have at least one parameter TRUE / FALSE
- (d) It is possible to write a valid C program without including any libraries TRUE / FALSE
- (e) The pre-processor runs before the compiler TRUE / FALSE
- (f) The post-processor runs after the compiler TRUE / FALSE
- (g) The printf function is defined in stdlib.h TRUE / FALSE
- (h) The argument of the cos function must be in degrees TRUE / FALSE
- (i) A C file will compile but will not link if there is no main function TRUE / FALSE
- (j) `sizeof(int) < 5` TRUE / FALSE

2. Expressions and Assignment (5 x 1p each = 5p)

For each of the following five printf's write down what will be printed

```
float result;
int num1 = 2, num2=7, num3=3;
double val1=3.0, val2=8.5, val3=5.0;

printf("(a) %f\n", result = num2/num1);

printf("(b) %f\n", result = val2+num2*num1);

printf("(c) %f\n", result = ++num3+val2*num3);

printf("(d) %f\n", result= num2/5*num1);

printf("(e) %f\n", result = ++num1 + num2/(num1--));
```

3. Short answers (5 x 2p each = 10p)

(a) How does Darth Vader eat?

(b) What is a header file?

(c) What is the difference between `scanf("%d", &a);` and `scanf("%d", a);` ?

(d) What is the difference between a 32-bit int and a 32-bit float?

(e) What is a cache?

4. Number Conversions (5 x 3pt each = 15pt)

(a) Convert 125_{15} to decimal

(b) Convert 123_4 to binary

(c) Convert $CAFE_{16}$ to octal

(d) Convert the following 32-bit float number (in IEEE 754 standard) to decimal

1 1 0 0 0 0 0 1 1 0 1 1 0

(e) Convert $BEC00000_{16}$ (a 32-bit float stored in IEEE 754 format) to decimal:

5. Rectangle Properties (10 pt)

Write a complete C program that calculates the area and the perimeter of a rectangle. The program must ask the user to enter the Cartesian coordinates of the lower-left and the upper-right corner of the rectangle. Using these values, the program must then call two functions that return the area and the perimeter of the rectangle. The main function must then print the results on the screen.

6. Decimal to Binary Conversion (15 p)

Write a complete C program that reads an integer number from the keyboard and then prints its binary representation on the screen. You can assume that the number that the user will enter will always be in the range from 0 to 32.

Question	Max	Score
True/False	10	
Expressions	5	
Short answers	10	
Number Conversions	15	
Rectangle Properties	10	
Decimal to Binary	15	
Program 1 (lab)	10	
Program 2 (lab)	15	
Program 3 (lab)	15	
Program 4 (lab)	15	
Program 5 (lab)	15	
TOTAL:	135	

May the source be with you!