EECS 22: Advanced C Programming

Lecture 19

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Lecture 19: Overview

- Course Administration
  - Reminder: Final course evaluation
- Review Quiz

Course Administration

- Final Course Evaluation
  - Open until end of 10th week (Sunday night)
  - Nov. 15, 2011, through Dec. 4, 2011, 11:45pm
  - Online via EEE Evaluation application
- Mandatory Evaluation of Course and Instructor
  - Voluntary
  - Anonymous
  - Very valuable
    - *Pioneers!*
    - Please help to improve this class!
- Please spend 5 minutes!

Review Quiz: Question 1

- Which of the following statements is true for an *algorithm*?
  (Check all that apply!)

a) An algorithm must be indeterministic.
b) An algorithm solves a problem quickly.
c) An algorithm is historically based on Al Gore's rythm.
d) An algorithm executes a program using pseudo code.
e) An algorithm must terminate after a finite number of steps.

Review Quiz: Question 1

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d) An algorithm executes a program using pseudo code.
e) An algorithm must terminate after a finite number of steps.

Review Quiz: Question 2

- In C, which properties does every object have?
  (Check all that apply!)

a) A size.
b) A value.
c) A weight.
d) A type.
e) A location.

Review Quiz: Question 2

- In C, which properties does every object have?
  (Check all that apply!)

a) A size.
b) A value.
c) A weight.
d) A type.
e) A location.

Review Quiz: Question 3

- What is the result type of the following expression?

```
-1 + 2.3f * (4.5 / 67f) – (short)89
```

a) **`short int`**
b) **`int`**
c) **`long int`**
d) **`float`**
e) **`double`**

Review Quiz: Question 3

- What is the result type of the following expression?

```
-1 + 2.3f * (4.5 / 67f) – (short)89
```

a) `short int`
b) `int`
c) `long int`
d) `float`
e) **`double`**

Review Quiz: Question 4

- Given the following code fragment,

```
double x;
double y;

x = (int)(y + 0.5);
```

which of the following statements is true? (Check all that apply!)

a) for **`y=5.0`**, **`x`** is set to **`5.0`**
b) for **`y=5.1`**, **`x`** is set to **`5.0`**
c) for **`y=5.49`**, **`x`** is set to **`5.0`**
d) for **`y=5.5`**, **`x`** is set to **`6.0`**
e) for **`y=5.95`**, **`x`** is set to **`6.0`**

Review Quiz: Question 4

- Given the following code fragment,

```
double x;
double y;

x = (int)(y + 0.5);
```

which of the following statements is true? (Check all that apply!)

a) for **y=5.0**, **x** is set to **5.0**
b) for **y=5.1**, **x** is set to **5.0**
c) for **y=5.49**, **x** is set to **5.0**
d) for **y=5.5**, **x** is set to **6.0**
e) for **y=5.95**, **x** is set to **6.0**

Review Quiz: Question 5

- What is the value of **x** after the following code fragment is executed?

```
int x = 10;
while(x > 0)
   { x -= 2;
    }
```

a) **-2**
b) **-1**
c) **0**
d) **1**
e) **2**

Review Quiz: Question 5

- What is the value of **x** after the following code fragment is executed?

```
int x = 10;
while(x > 0)
   { x -= 2;
    }
```

a) `-2`
b) `-1`
c) **`0`**
d) `1`
e) `2`

Review Quiz: Question 6

- Given that the C standard math library is included, which of the following expressions results in the value **`4.0`**?
(Check all that apply!)

a) **`pow(16.0, .5)`**
b) **`4.0 * cos(0.0)`**
c) **`3 + sin(0.0)`**
d) **`log10(10000.00)`**
e) **`sqrt(15.0) + 1`**

Review Quiz: Question 6

- Given that the C standard math library is included, which of the following expressions results in the value **`4.0`**?
  (Check all that apply!)

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b) **`4.0 * cos(0.0)`**
c) **`3 + sin(0.0)`**
d) **`log10(10000.00)`**
e) **`sqrt(15.0) + 1`**

Review Quiz: Question 7

- What is output by the following program fragment?

```
char s[] = "EECS22";

s[4] = 0;
printf("%s %c", s, s[2]);
```

a) **`EECS02 2`**
b) **`EEC 22 0`**
c) **`E E`**
d) **`EECS C`**
e) **`EEC C`**

Review Quiz: Question 7

- What is output by the following program fragment?

```
char s[] = "EECS22";

s[4] = 0;
printf("%s %c", s, s[2]);
```

a) EECS02 2
b) EEC 22 0
c) E E
d) **EECS C**
e) EEC C

Review Quiz: Question 8

- In the program below, what is printed by the function call **`g(1)`**?

a) **1 2**
b) **2 3**
c) **1 1**
d) **2**
e) **1**

```
1  int f(int x)
2  { printf("%d ", x);
3    return x + 1;
4  }
5  int g(int x)
6  { printf("%d ", f(x));
7    return x + 2;
8  }
```

Review Quiz: Question 8

- In the program below, what is printed by the function call **`g(1)`**?

a) **`1 2`**
b) **`2 3`**
c) **`1 1`**
d) **`2`**
e) **`1`**

```
1 int f(int x)
2 { printf("%d ", x);
3   return x + 1;
4 }
5 int g(int x)
6 { printf("%d ", f(x));
7   return x + 2;
8 }
```


Review Quiz: Question 9

- What is recursion?
  (Check all that apply!)

a) A function that does not terminate.
b) A function that calls itself.
c) A function that contains a loop.
d) A function **`f`** that calls a function **`g`** which calls **`f`**.
e) A function that returns no value.

Review Quiz: Question 9

- What is recursion?
  (Check all that apply!)

a) A function that does not terminate.
b) A function that calls itself.
c) A function that contains a loop.
d) A function **f** that calls a function **g** which calls **f**.
e) A function that returns no value.

Review Quiz: Question 10

- Given the function definition below, what is printed for the function call **f(3)**?

a) **1 2 3**
b) **1 2 3 4**
c) **3 2 1 0**
d) **4 3 2 1**
e) **3 2 1**

```
1 void f(int x)
2 {
3   printf("%d ", x);
4   if (x > 0)
5     { f(x-1); }
6 }
```

Review Quiz: Question 10

- Given the function definition below, what is printed for the function call **`f(3)`**?

a) 1 2 3
b) 1 2 3 4
c) **3 2 1 0**
d) 4 3 2 1
e) 3 2 1

```
1 void f(int x)
2 {
3   printf("%d ", x);
4   if (x > 0)
5     { f(x-1); }
6 }
```

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Review Quiz: Question 11

- Given the following definition of the vectors **`v1`**, **`v2`** and **`v3`**, what is a correct way to perform a vector addition of **`v1`** and **`v2`**?

```
struct v {int x, y;} v1, v2, v3;
```

a)
```
v3 = v1 + v2;
```
b)
```
v3 = v1[x]*v2[y] + v1[y]*v2[x]
```
c)
```
v3[0] = v1[0] + v2[0];
v3[1] = v1[1] + v2[1];
```
d)
```
v3.x = v1.x + v2.x;
v3.y = v1.y + v2.y;
```
e)
```
v3->x = v1->x + v2->x;
v3->y = v1->y + v2->y;
```

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Review Quiz: Question 11

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```
struct v {int x, y;} v1, v2, v3;
```

a) `v3 = v1 + v2;`

b) `v3 = v1[x]*v2[y] + v1[y]*v2[x]`

c)
```
v3[0] = v1[0] + v2[0];
v3[1] = v1[1] + v2[1];
```

d)
```
v3.x = v1.x + v2.x;
v3.y = v1.y + v2.y;
```

e)
```
v3->x = v1->x + v2->x;
v3->y = v1->y + v2->y;
```


Review Quiz: Question 12

- What could cause a **`bus error`**? (Check all that apply!)

a) Waking up late and missing the bus.
b) Calling a recursive function.
c) Accessing an array with an index out of range.
d) Referencing a pointer variable with invalid value.
e) Accessing an integer variable with invalid value.

Review Quiz: Question 12

- What could cause a **`bus error`**? (Check all that apply!)

a) Waking up late and missing the bus.
b) Calling a recursive function.
c) Accessing an array with an index out of range.
d) Referencing a pointer variable with invalid value.
e) Accessing an integer variable with invalid value.

Review Quiz: Question 13

- Given the program segment below, what is the value of **`*p`** at the end?

a) **1**
b) **2**
c) **3**
d) **4**
e) **5**

```
1  int x[] = {1,2,3,4,5};
2  int *p = &x[2];
3
4  p++;
5  p -= 2;
```

Review Quiz: Question 13

- Given the program segment below, what is the value of **`*p`** at the end?

a) 1
b) **2**
c) 3
d) 4
e) 5

```
1  int x[] = {1,2,3,4,5};
2  int *p = &x[2];
3
4  p++;
5  p -= 2;
```


Review Quiz: Question 14

- Given the function and variable definitions shown below, which function call is valid? (Check all that apply!)

a) `StrLen(cp);`
b) `StrLen(ca);`
c) `StrLen(c);`
d) `StrLen(i);`
e) `StrLen("abc");`

```
1  int StrLen(char *s)
2  {  int l = 0;
3
4     while(*s)
5     { s++;
6       l++;
7     }
8     return l;
9  }
10 char *cp  = "hello";
11 char ca[] = "world";
12 char c = 'c';
13 int  i = 42;
```

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c) `StrLen(c);`
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```
1  int StrLen(char *s)
2  {  int l = 0;
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4     while(*s)
5     { s++;
6       l++;
7     }
8     return l;
9  }
10 char *cp  = "hello";
11 char ca[] = "world";
12 char c = 'c';
13 int  i = 42;
```


Review Quiz: Question 15

- What does the following code segment print?

```
1 char s[] = "Hppe!Mvdl!boe!Ibqqz!Ipmjebzt";
2 char *p;
3 p = &s[0];
4 while(*p)
5 { printf("%c", *p - 1);
6   p++;
7 }
```

a) `Hppe!Mvdl!boe!Ibqqz!Ipmjebzt`
b) `Happy Holidays and Good Luck`
c) `Happy Luck and Good Holidays`
d) `Good Holidays and Happy Luck`
e) `Good Luck and Happy Holidays`

Review Quiz: Question 15

- What does the following code segment print?

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1 char s[] = "Hppe!Mvdl!boe!Ibqqz!Ipmjebzt";
2 char *p;
3 p = &s[0];
4 while(*p)
5 { printf("%c", *p - 1);
6   p++;
7 }
```

a) `Hppe!Mvdl!boe!Ibqqz!Ipmjebzt`
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c) `Happy Luck and Good Holidays`
d) `Good Holidays and Happy Luck`
e) **`Good Luck and Happy Holidays`**