EECS 22: Advanced C Programming Lecture 13

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Lecture 13: Overview

- Course Administration
 - Fairness quiz
 - Midterm course evaluation
- Midterm Course Review
 - Syntax and semantics of C programs
 - Types, expressions, statements, functions
 - Recursion, modules, Makefile, debugging
- Practice
 - Review Quiz

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EECS 22 Fairness Quiz

- Given the clearly announced hard deadline, which of the following are valid excuses for acceptance of a late submission? (Check all that apply!)
 - a) My watch showed I still had 2 minutes.
 - b) I used the wrong submission command.
 - c) I was still debugging the last problem in my code.
 - d) My network connection broke down.
 - e) I had a medical emergency and can provide documentation.

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EECS 22 Fairness Quiz

- Given the clearly announced hard deadline, which of the following are valid excuses for acceptance of a late submission? (Check all that apply!)
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 - d) My network connection broke down.
- e) I had a medical emergency and can provide documentation.

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Course Administration

- Midterm Course Evaluation
 - This week!
 - Wednesday, Oct. 25, 8am Nov. 1, 8am
 - Online via EEE Evaluation application
- Feedback from students to instructors
 - Completely voluntary
 - Completely anonymous
 - Very valuable
 - · Help to improve this class!
- Mandatory Final Course Evaluation
 - expected for week 10 (TBA)

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Midterm Course Review

- · Introduction, course setup, Linux
- Tokens, basic types, operators, formatted I/O
- · Control-flow statements, conditionals and loops
- · Arrays and array indexing
- · Functions, call graph, call trace, call stack
- · Pass by value vs. pass by reference
- Recursion
- · Scope, variable lifetime, storage classes
- Compiler components, translation units
- Make and Makefile, rules, targets and dependencies
- Assertions, debugging, GDB commands

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- Today's computers run at which clock speed?
 - a) 85 MPH
 - b) 1 kHz
 - c) 1 ms
 - d) 1 GHz
 - e) 1 MHz

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Quiz: Question 11

- Today's computers run at which clock speed?
 - a) 85 MPH
 - b) 1 kHz
 - c) 1 ms
 - d) 1 GHz
 - e) 1 MHz

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- Which of the following names are valid keywords in ANSI C? (Check all that apply!)
 - a) if
 - b) when
 - c) void
 - d) main
 - e) Int

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Quiz: Question 12

- Which of the following names are valid keywords in ANSI C? (Check all that apply!)
- 🔫 a) if
 - b) when
 - c) void
 - d) main
 - e) Int

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- Which of the following names are valid identifiers in ANSI C? (Check all that apply!)
 - a) xyz
 - b) PC
 - c) dollar amount
 - d) My_Very_Long_Variable_Name
 - e) 2fast4you

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Quiz: Question 13

- Which of the following names are valid identifiers in ANSI C? (Check all that apply!)
- a) xyz
 - b) PC
 - c) dollar amount
- d) My_Very_Long_Variable_Name
 - e) 2fast4you

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- Which of the following constructs are valid type names in ANSI C? (Check all that apply!)
 - a) short char
 - b) long double
 - c) signed long long
 - d) unsigned float
 - e) signed

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Quiz: Question 14

- Which of the following constructs are valid type names in ANSI C? (Check all that apply!)
 - a) short char
 - b) long double
 - C) signed long long
 - d) unsigned float
- e) signed

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- Which of the following constants is of type double? (Check all that apply!)
 - a) 42
 - b) .42
 - c) 4e2
 - d) 4E2
 - e) 42f

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Quiz: Question 15

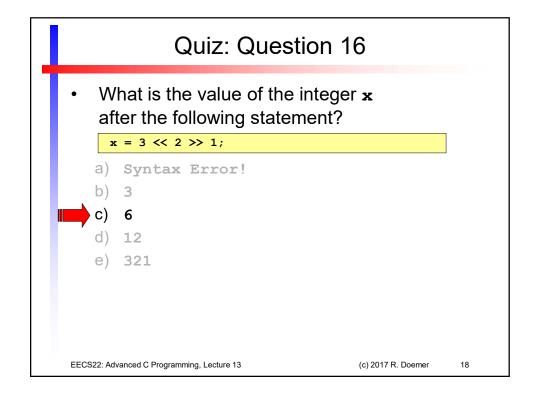
- Which of the following constants is of type double? (Check all that apply!)
 - a) 42
 - b) .42
 - c) 4e2
 - -, ---
 - d) **4E2**
 - e) 42f

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Quiz: Question 16 • What is the value of the integer x after the following statement? x = 3 << 2 >> 1; a) Syntax Error! b) 3 c) 6 d) 12 e) 321 EECS22: Advanced C Programming, Lecture 13 (c) 2017 R. Doemer 17



- Which of the following expressions correctly computes the polynomial $p = 2x^2 3x + 4$? (Check all that apply!)
 - a) $p = 2x^2 3x + 4$;
 - b) p = 2xx 3x + 4;
 - c) p = x*x*2 3*x + 4.0;
 - d) p = 2*(x*x + 3)*x + 4;
 - e) p = (2*x 3)*x + 4;

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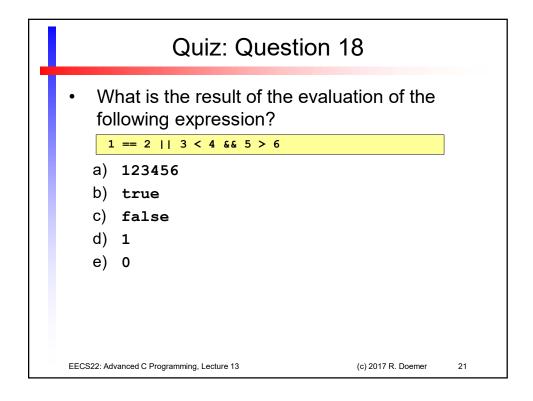
Quiz: Question 17

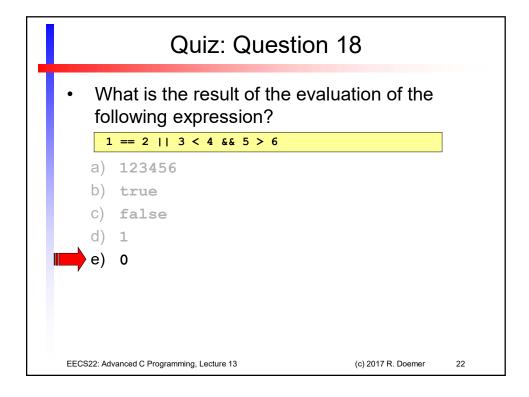
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· Simple prime number test:

The following code fragment iterates variable i over the range $2 \le i < x$ to find a divisor of x.

What should go into box 1 in line 4?

- a) i = 0;
- b) i = 1;
- c) i = 2;
- $d) \quad i = x;$
- e) x = 0;

```
int x, i;
printf("Please input a number: ");
scanf("%d", &x);
initialize variable i
while(i < x)
{ if(x % i == 0)
    { printf("%d is not prime\n", x);
    break;
}
i++;
}
if( none of the i is a divisor of x )
{ printf("%d is prime\n", x);
}</pre>
```

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Quiz: Question 19

• Simple prime number test:

The following code fragment iterates variable i over the range $2 \le i < x$ to find a divisor of x.

What should go into box 1 in line 4?

- a) i = 0;
- b) i = 1;
- c) i = 2;
- $d) \quad i = x;$
- e) x = 0;

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int x, i;
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    { printf("%d is not prime\n", x);
    break;
    }
    i++;
}
if( none of the i is a divisor of x )
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Simple prime number test:

The following code fragment iterates variable i over the range $2 \le i < x$ to find a divisor of x.

What should go into box 2 in line 12?

- a) x / i == 0
- b) x < i
- c) i / x == 0
- d) i + 1 == x
- e) i == x

```
int x, i;
printf("Please input a number: ");
scanf("%d", &x);
initialize variable i
while(i < x)
{ if(x % i == 0)
    { printf("%d is not prime\n", x);
    break;
}
i++;
}
if( none of the i is a divisor of x )
{ printf("%d is prime\n", x);
}</pre>
```

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Quiz: Question 20

• Simple prime number test:

The following code fragment iterates variable i over the range $2 \le i < x$ to find a divisor of x.

What should go into box 2 in line 12?

- a) x / i == 0
- b) x < i
- c) i / x == 0
- d) i + 1 == x
- e) i == x

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int x, i;
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initialize variable i
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    { printf("%d is not prime\n", x);
    break;
}
i++;
}
if( none of the i is a divisor of x )
    { printf("%d is prime\n", x);
}</pre>
```

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- Which of the following variable declarations are valid in ANSI-C? (Check all that apply!)
 - a) double xyz;
 - b) double x, y, z;
 - c) double x = 1.0;
 - d) double x = 1.1, y = 2.2, z = 3.3;
 - e) double x,y,z = 1.0,2.0,3.0;

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Quiz: Question 21

- Which of the following variable declarations are valid in ANSI-C? (Check all that apply!)
- a) double xyz;
 - b) double x, y, z;
 - c) double x = 1.0;
 - d) double x = 1.1, y = 2.2, z = 3.3;
 - e) double x,y,z = 1.0,2.0,3.0;

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- Which of the following data types has the largest range of representable numbers?
 - a) char
 - b) short int
 - c) long long int
 - d) unsigned int
 - e) signed long int

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Quiz: Question 22

- Which of the following data types has the largest range of representable numbers?
 - a) char
 - b) short int
 - c) long long int
 - d) unsigned int
 - e) signed long int

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- Which of the following data types can store the greatest value?
 - a) long int
 - b) long long int
 - c) unsigned long long int
 - d) float
 - e) double

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Quiz: Question 23

- Which of the following data types can store the greatest value?
 - a) long int
 - b) long long int
 - C) unsigned long long int
 - d) float

🛑 e) double

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- In the gdb debugger, what does next do?
 - a) It moves to the next argument of the function.
 - b) It calls the next function in the program.
 - c) It executes the next statement in the program.
 - d) It prints the value of the next variable.
 - e) It loads the next program into the debugger.

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Quiz: Question 24

- In the gdb debugger, what does next do?
 - a) It moves to the next argument of the function.
 - b) It calls the next function in the program.
 - c) It executes the next statement in the program.
 - d) It prints the value of the next variable.
 - e) It loads the next program into the debugger.

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- Assume that x is an integer in the range of 1 through 10 inclusively.
 - Which of the following expressions can be used as a test for **x** being an even number? (Check all that apply!)
 - a) x % 2 == 0
 - b) x / 2 > 1
 - c) x % 2 == 1
 - d) x / 2 * 2 == x
 - e) x==2 || x==4 || x==6 || x==8 || x==10

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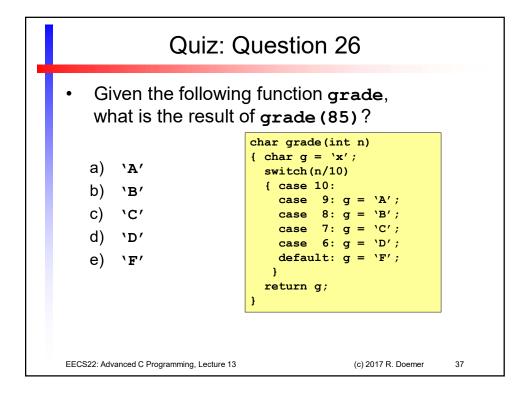
Quiz: Question 25

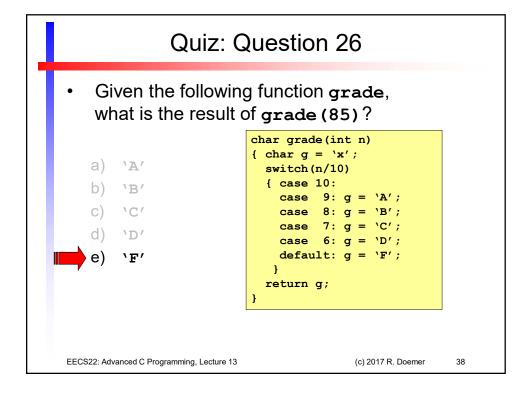
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- a) x % 2 == 0
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 - 📥 d) x / 2 * 2 == x
 - e) x==2 || x==4 || x==6 || x==8 || x==10

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

```
int x = 0;
for(x = 1; x <= 10; x++)
{ }</pre>
```

- a) 0
- b) 1
- c) 9
- d) 10
- e) 11

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Quiz: Question 27

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

```
int x = 0;
for(x = 1; x <= 10; x++)
{ }</pre>
```

- a) 0
- h) 1
- c) 9
- d) 10
- e) 11

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- Given the following program fragment, what is printed when it gets executed?
 - a) nothing
 - b) 0
 - c) 10
 - d) 20
 - e) 30

```
int i = 1;
int s = 0;
while (1)
   { i++;
   if (i >= 10)
        { break; }
   if (i % 2 == 1)
        { continue; }
   s += i;
   }
printf("%d", s);
```

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Quiz: Question 28

- Given the following program fragment, what is printed when it gets executed?
 - a) nothing
 - b) 0
 - c) 10
- d) 20
- e) 30

```
int i = 1;
int s = 0;
while (1)
    { i++;
    if (i >= 10)
        { break; }
    if (i % 2 == 1)
        { continue; }
    s += i;
    }
printf("%d", s);
```

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 Given the following code fragment, which of the following statements are true?

(Check all that apply!)

double f(int x);
void g(int x, int y)
{
 int z;

z = f(x) + 2*y;

return z;

- a) Function **f** is declared.
- b) Function g calls function f
- c) Variable **z** is a local variable of function **g**
- d) Function g is declared and defined.
- e) y is a parameter of function g.

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Quiz: Question 29

 Given the following code fragment, which of the following statements are true?

(Check all that apply!)

double f(int x);
void g(int x, int y)
{
 int z;

 z = f(x) + 2*y;
 return z;

- a) Function **f** is declared.
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- d) Function g is declared and defined.
- e) y is a parameter of function g.

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- Given the following program fragment, what is the value of g(2,f(3,4))?
 - a) 8
 - b) 9
 - c) 10
 - d) 11
 - e) 12

```
int x = 7;
int f(int x, int y)
{
   return x + y;
}
int g(int x, int y)
{
   return f(y, x);
}
```

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Quiz: Question 30

 Given the following program fragment, what is the value of g(2,f(3,4))?

- a) 8
- b) 9
- c) 10
- d) 11
- e) 12

```
int x = 7;
int f(int x, int y)
{
    return x + y;
}
int g(int x, int y)
{
    return f(y, x);
}
```

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