

**CS101 Fall 2011**  
**Midterm II (60 minutes)**  
**Thursday, November 3rd, 2011**

Name: \_\_\_\_\_ Section: \_\_\_\_\_

READ and complete the following:

- Bubble your Scantron only with a No. 2 pencil.
- On your Scantron, bubble :
  1. Your Name
  2. Your NetID
  3. Form letter "A"
  4. Bubble the corresponding 3-digit code (shown below) for your lab section on your Scantron.

Time	Monday	Tuesday	Wednesday	Thursday
9:00-10:50	101	104	107	109
11:00-12:50	102		110	
1:00-2:50		105		111
3:00-4:50	103	106	108	112

- 
- No electronic devices, books, notes, or cheat sheets are allowed while taking this exam.
  - Please fill in the most correct answer on the provided Scantron sheet.
  - We will not answer any questions during the exam.
  - Each question has only ONE correct answer.
  - You must stop writing when time is called by the proctors.
  - Hand in both these exam pages and the Scantron.
  - DO NOT turn this page UNTIL the proctor instructs you to.

1. The file lab6.c is in your current working directory and utilizes the math.h package. Select the command(s) that, when entered into the correct location, will correctly compile the file named lab6.c using the gcc compiler.

(a) TERMINAL : gcc lab6.c  
GEDIT :

(b) TERMINAL : -lm  
GEDIT : gcc lab6.c

(c) TERMINAL : gcc lab6.c -lm  
GEDIT :

(d) TERMINAL : gedit lab6.c &  
GEDIT : lab6.c -lm

2. Below is a list of common UNIX file system actions. Select the list of Unix commands that correspond with the four file system actions.

1)Copy a file 2)Delete a file 3)Print working directory 4)List the contents of a directory

(a) 1)cp 2)del 3)print 4)ls

(b) 1)copy 2)rm 3)pwd 4)ls

(c) 1)cpy 2)del 3)pwd 4)pwd

(d) 1)cp 2)rm 3)pwd 4)ls

3. You are in your home directory, with the following contents:

**Subdirectories:**

myfolder

**Files:**

myfile.c

Select the sequence of commands that, when entered into the terminal, will CREATE a new subdirectory named backup, then MOVE the file myfile.c into the subdirectory myfolder, and then COPY all of the contents of myfolder into the subdirectory backup:

- (a) mkdir backup  
move myfile.c myfolder  
cp myfolder/\* backup
- (b) mkdir backup  
mv myfile.c myfolder  
cp myfolder/\* backup
- (c) nfolder backup  
move myfile.c -- > myfolder  
cpy myfolder/myfile.c -- > backup
- (d) mkdir backup  
mv myfolder myfile.c  
cp myfolder/ALL backup

4. You are in your home directory. The home directory contains a subdirectory called lab9. Select the command that, when entered into the terminal, will delete the lab9 subdirectory as well as ALL of its contents:

- (a) delete lab9
- (b) rm lab9
- (c) remove lab9
- (d) rm -r lab9

5. In top-down design, what is the first function to be invoked in a program? (hint. It is also known as the top function or “general contractor”).

(a) `<stdio.h>`

(b) `main`

(c) `rand`

(d) `include`

Use the following code fragment to answer the **next two** questions.

```
double sum(int a, float b, double c)
{
    -----

    result = a + b + c;
    return result;
}
```

6. Filling in the above blank with which of the following lines would allow the function named `sum` to compile without errors and return the most accurate value of `result`?

(a) `#include <math.h>`

(b) `int result;`

(c) leave blank, no coding necessary

(d) `double result;`

7. Which is the correct way to call the function named `sum` and assign the value it returns to the variable `r` without any rounding or truncation error?

(a) `sum(1, 2.5, 6.8) = r;`

(b) `function r = sum(1, 2.5, 6.8);`

(c) `r = sum(1, 2.5, 6.8);`

(d) `r = sum(2.5, 6.8, 1);`

8. Which of the following is a valid C function **prototype** that has both a single integer and an array of doubles in its parameter list?

(a) `function myfunc(int count, double alias)`

(b) `int myfunc(int, double []);`

(c) `int myfunc(int count, double alias);`

(d) `int myfunc( double alias[]);`

9. Consider the following C code:

```
#include <stdio.h >

void main(void)
{
    int m,n;

    m = 1;
    n = 0;
    switch(m)
    {
        case 1: m = m + 1;
        case 2: n = n + 2;
        case 3: m = m - 1;
        case 4: n = n - 2;
        default: m = m - 2;
    }
    printf("m = %i,n = %i\n",m,n);
}
```

Choose the answer that gives the correct output of the program.

(a) `m = 0, n = 0`

(b) `m = 1, n = 0`

(c) `m = 2, n = 0`

(d) `m = -1, n = 0`

10. The following C program compiles and runs without errors. What is its output?

```
#include <stdio.h>
void main(void)
{
    int x = 6;
    if(x%3 == 1)
    {
        switch(x/2)
        {
            case 3: printf("A");
                    break;
            case 2: printf("B");
                    break;
            case 1: printf("C");
                    break;
            default: x++;
        }
    }
    if(x%2 == 0)
    {
        switch(x/2)
        {
            case 3: printf("X");
                    break;
            case 2: printf("Y");
                    break;
            case 1: printf("Z");
                    break;
            default: x++;
        }

        if(x < 5)
            printf("P");
        else
            printf("Q");
    }
} /* end of main */
```

(a) XQ

(b) X

(c) CXP

(d) YQ

11. The following C program compiles and runs without errors. What is its output?

```
#include <stdio.h>

void main(void)
{
    int x = -1;
    int y = -1;

    if(((x + y) >= 3) || ((x + y) <= -3))
        if(x > y)
            printf("X");
        else
            printf("Y");
}
```

(a) X

(b) Y

(c) X Y

(d) Nothing will be displayed

12. The following C program compiles and runs without errors. What is its output?

```
#include <stdio.h>

void main(void)
{
    int i = 3;

    if(3 == i)
        printf("%i", i);
    else
        printf("Not equal");
}
```

(a) i

(b) 3

(c) i n

(d) Not equal

13. The following C program compiles and runs without errors. What is its output?

```
#include <stdio.h>

void main(void)
{
    int ten_quarters = 2.5;

    float intermediate, reverse, output;
    intermediate = ten_quarters;
    reverse = 1/intermediate;
    output = (int)(reverse + 0.55);
    printf("%f", output);
}
```

(a) 0.000000

(b) 1.000000

(c) 2.000000

(d) 3.000000

14. The following C program compiles and runs without errors. What is its output?

```
#include <stdio.h>

void main(void)
{
    char atomic[] = {'c', 'a', 'r', 'b', 'o', 'n', '\0', 'n', '\0'};

    printf("%s", atomic);
}
```

(a) carbonn

(b) carbon0n0

(c) carbon

(d) carbon\0n\0

15. Which of the following code fragments would display the following output?

54321

(a) 

```
for(i = 5; ;i = i - 1)
{
    if(i == 1)
        break;
    printf("%i", i);
}
```

(b) 

```
for(i = 5; i >= 1; )
{
    printf("%i", --i);
}
```

(c) 

```
i = 5;
while(i >= 0)
{
    printf("%i", i);
    i = i - 1;
}
```

(d) 

```
i = 5;
do{
    printf("%i", i);
    i = i - 1;
}while(i >= 1);
```

16. Given the following C program that compiles and runs without errors, what is the output of the code shown below for the following input:

```
play with   s p a c e s
```

Note: There is one space between "play" and "with" and five spaces between "with" and "s" and one space between each of the letters in "s p a c e s".

```
#include <stdio.h >

void main(void)
{
    char c;
    scanf("%c", &c);
    do{
        if(c != ' ')          /* A SINGLE SPACE (BLANK) */
            printf("%c", c);    /* NON - SPACE CHARACTER */
        else
        {
            printf(" *");      /* A SINGLE STAR */
            while(EOF != scanf("%c",&c)) /* loop until a NON - SPACE CHARACTER is read */
            {
                if(c != ' ')
                {
                    printf("%c", c);    /* NON - SPACE CHARACTER */
                    break;
                }
            }
            /* END OF WHILE LOOP */
        }
        /* END OF ELSE BLOCK */
    }while(EOF != scanf("%c",&c));    /* terminate if EOF */
}
```

- (a) play \*with\*s\*p\*a\*c\*e\*s
- (b) playwithspaces
- (c) play \*with\*\*\*\*\*s\*p\*a\*c\*e\*s
- (d) play \*with\* spaces

17. Which of the following code fragments displays the following triangle made of stars?

```
  *
 ***
*****
```

- (a) `for(i = 1; i <= 5; i = i + 2)`  
{  
 `printf(" * ");`  
 `printf("\n");`  
}
- (b) `for(i = 1; i <= 5; i = i + 2)`  
{  
 `for(j = 1; j <= i; j = j + 1)`  
 `printf(" * ");`  
 `printf("\n");`  
}
- (c) `for(i = 1; i <= 5; i = i + 2)`  
{  
 `for(j = 3 - (i + 1)/2; j >= 1; j = j - 1)`  
 `printf(" "); /* print one space */`  
 `for(k = 1; k <= i; k = k + 1)`  
 `printf(" * ");`  
 `printf("\n");`  
}
- (d) `for(i = 1; i <= 5; i = i + 2)`  
{  
 `for(j = 3 - (i + 1)%2; j >= 1; j = j + 1)`  
 `printf(" "); /* print one space */`  
 `for(k = 1; k <= i; k = k + 1)`  
 `printf(" * ");`  
 `printf("\n");`  
}

18. The variable `w` is declared and is followed by a `printf` statement as shown below.

```
double w = 2011.838367;
```

```
printf("%9.4lf", w);
```

If the above code is inserted in a complete C program that compiles and runs without errors, then what will the output of the above code segment be when the program is run?

(a) 2011.838367

(b) 002011.8383

(c) 2011.8384

(d) 2011.83837

19. Given the prototype for the function named `blackbox` as,

```
double blackbox(int a, char b);
```

what is the data type of the output of the function `blackbox` ?

(a) int

(b) char

(c) int and char

(d) double

20. Select the printf statement that will correctly display the declared variables in the following order:

```
10 21.8312 compile
```

```
int a = 10;  
char word[] = "compile";  
float number = 21.8312;
```

(a) `printf("%i %s %7.4f", a, word, number);`

(b) `printf("%i %7.4f %s", a, word, number);`

(c) `printf("%i %7.4f %s", a, number, word);`

(d) `printf("%7.4f %s %i", word, number, a);`

21. Select the correct C language code for a function that has one input parameter, an arbitrary size array of data type int and the function returns the second element of this array.

(a) `yes(int a[])`  
{  
    return a[2];  
}

(b) `int yes(int a[])`  
{  
    return a[1];  
}

(c) `int yes(int a[])`  
{  
    return a[2];  
}

(d) `int yes(int [100])`  
{  
    return a[1];  
}

22. Choose the appropriate C statement to **read** the price of an item as a real number.

(a) `scanf(%price, price);`

(b) `scanf(i, price);`

(c) `printf("%f", &price);`

(d) `scanf("%f", &price);`

23. The following C program compiles and runs without errors. What is its output?

```
#include <stdio.h >
#define A 7

void main(void)
{
    int i, c;
    int a[A] = {1, 2, 3, 4, 5, 6, 7};

    for(i = 0; i < A/2; i++)
    {
        c = a[i];
        a[i] = a[A - (i + 1)];
        a[A - (i + 1)] = c;
    }

    for(i = 0; i < A; i++)
        printf(" %i ", a[i]);
}
```

(a) 1 2 3 4 5 6 7

(b) 7 6 5 4 3 2 1

(c) 1 2 3 4 1 2 3

(d) 5 6 7 4 5 6 7

24. The following C program compiles and runs without errors. What is its output?

```
#include <stdio.h>

void main(void)
{
    int Array[3], Xarray[] = {1, 2, 3, 4};
    int i;

    for(i = 0; i < 3; ++i)
    {
        Array[i] = i;
        printf("%i ", Array[i]);
    }

    for(i = 0; i < 3; ++i)
        printf("%i ", Xarray[++i]);
}
```

(a) 0 1 2 1 3

(b) 0 1 2 1 2 3 4

(c) 1 2 2 4

(d) 0 1 2 2 4

25. The following C program compiles and runs without errors. What is its output?

```
#include <stdio.h>

void append(int counter, int arr[])
{
    counter = counter + 1;
    arr[counter] = arr[0] + arr[1] + arr[2];
    return;
}

void main(void)
{
    int index = 2;
    int data[4] = {1, 2, 3};
    append(index, data);
    printf("%i %i\n", index, data[3]);
}
```

(a) 2 3

(b) 3 3

(c) 2 6

(d) 3 6

## Extra Credit

26. Assume that the data file named `input.dat` has the following data:

`-1`

that is, a single value, minus one. Further assume that the C program shown below is in the file named `extra.c` and compiles without errors and is run by typing the following at the Unix prompt:

```
./a.out < input.dat
```

What is its output?

```
#include <stdio.h>
```

```
void main(void)
{
    int value = 999, response = 42;
    response = scanf("%i", &value);
    printf("%i %i\n", response, value);
}
```

(a) `-1 -1`

(b) `-1 999`

(c) `1 -1`

(d) `1 999`