Introduction to Computer Science and C Programming-Quiz1

2016/10/19

ID:_____ Name:_____

pts Total, 50 min

1. (35 pts total) **Multiple Choice Questions** *(There may exist one or more than one answer. You will lose ? pts till there is no pts to lose for one wrong choice in each question)*

(1) (5pts) Give a declaration ***int a = 8, b = 32, c = 4, d = 16, e = 64, f = 2;***
After performing ***a-=b+=c+++d+--e/-f;*** statement, which of the following values are **wrong**? **BCDF**
ANS:_____

(A) a = -13
(B) b = 22
(C) c = 4
(D) d = 17
(E) e = 63
(F) f = -2

Details: First take a look at the piece "*c+++d+--e/-f*", which can be view as "(c++) + d + (--e) / -f". The result of this expression will be (4 + 16 + 63 / -2), equals to -11. However, after performing the line, values of some variables will change, that is **c = 5, d = 16, e = 63, f = 2**.
Now, b += -11, then **b = 21**. Final, a -= 21, then **a = -13**.

(2) (10pts) Which of the following are **valid** declarations? **BCDEFH**
ANS:_____

(A) int c-d-e;
(B) int INT;
(C) int f23456;
(D) int _bcd;
(E) int helloWorld;
(F) int Float;
(G) int 2you;
(H) int a, b, c;
(I) int a book;
(J) int if;

Details:
(A) symbol '-' is not allow => invalid
(B) INT≠int, so it is not a keywork => valid
(C) valid
(D) variables start from '_' is allowed => valid
(E) There is not space between o, W => valid
(F) Float≠float => valid
(G) variables can't start from number => invalid
(H) Valid
(I) Space is not allowed => invalid
(J) if is a keyword => invalid

(3) (5pts) Given a fragment of codes, which of the following statements are **correct**? **ADEF**

```
switch (i)
{
    case 0:  printf("aaa");
    case 2:  default:  printf("bbb");  break;  printf("ccc");
    case 4:  printf("ddd");
    case 1:  printf("eee");  printf("fff");
    case 3:  printf("ggg");
             break;
}
```

ANS: _____

(A) If i = 1, the output is *eeefffggg*
(B) If i = 0, the output is *aaabbbccc*
(C) If i = 8, the output is *bbbccc*
(D) If i = 2, the output is *bbb*
(E) If i = 3, the output is *ggg*
(F) If i = 4, the output is *dddeeefffggg*

Details: Be careful of whether there is break in each case block.

(4) (5pts) Suppose we call *scanf* and apply *if*-statement as follow:

```
scanf("%d%f%d", &i, &j, &k);
if(k < 5)
    k += 10;
    i *= 10;
```

All variables are declared with correct type. If the user enters **"10.3 5 6"**, which of the following statements are **correct** after executing codes above? **CE**

ANS: _____

(A) i = 103, j = 5.0
(B) i = 100, k = 6
(C) i = 100, j = 0.3
(D) j = 5.0, k = 6
(E) j = 0.3, k = 5

Details: *scanf* first reads '1' '0', and it encounters '.', which results 10 be assigned to the *integer i*.
Next, '3' is read, then encounters ' ', it 0.3 will be assign to the *floating number j*.
Last, '5' and ' ' are read. The *integer k* will be assigned to 5. Because there are no more variables, the remaining input will not affect the result of *i, j, k*. Therefore, *i = 10, j = 0.3, k = 5*.
k is not smaller than 5, so the assignment "k += 10;" will not be performed. Be careful that if there are no { } after an *if*-statement, then only one line will be performed when *if*-statement is true. Thus, "i *= 10;" will always be performed. => ***i = 100, j = 0.3, k = 5***.

(5) (5pts) Which of the following statements are **true**? **B**

ANS: _____

(A) The % operator is able to be applied on floating-point numbers.
(B) Unary + - operators have higher precedence than binary / % operators.
(C) The statements "*a = b; b = a;*" will exchange the value of two variables.
(It means that the new value of *a* will be the original value of *b*, and the new value of *b* will be the original value of *a*)
(D) *i*++ means "increment *i* immediately," while *i*-- means "use the old value of *i* for now, but increment *i* later."
(E) The statement "*i *= j + k;*" and the statement "*i = i * j + k;*" have the same result of *i*.

Details: (A) The remainder operator can only be applied on integer type (integer, long, …, etc)
(C) These two statement will cause the results that a has b's value, and b is still the same.
(D) i++ means "use the old value of *i* for now, but increment *i* later.", i-- means "use the old value of *i* for now, but decrement *i* later."
(E) "*i *= j + k;*" represents "*i = i *(j + k);*"

(6) (5pts) Which of the following statements is **wrong**? **CDEF**

ANS: _____

(A) C programmers can create an infinite loop by using the statement "*while(100){…}*."
(B) When a *do* statement is executed, the loop body will be executed at least once.
(C) Both floating-point numbers and strings can be tested in *switch* statements
(D) "*/n*" means a new line, and "*/t*" means a horizontal tab in *printf* function.
(E) For a variable *i =100*, the statement "*printf("%2d", i);*" will show *00* on the screen.
(F) The conditional expression *expr1* ? *expr2* : *expr3* should be read "if *expr1* then *expr3* else *expr2*."

Details: (C) Only variables with integer type (int, long, char,…etc), can be tested in switch
(D) "\n" means a new line, and "\t" means a horizontal tab
(E) For "*printf("%nd", i)*", if the value to be printed requires more than *n* characters, the field width automatically expands to the necessary size. Therefore, it will show *100*
(F) *expr1* ? *expr2* : *expr3* should be read "if *expr1* then *expr2* else *expr3*."

2. (16 pts) Identify and correct the errors of following statements if there are errors.

(1)	(2)

if gender = 0
printf ("Male")
else
printf ("Female\n");
	int result;
	result += 3*4;
	result -= 5;
	result /= 2.0;
	printf ("%d", result);

(3)
int a,b,c,result;
printf ("Enter three integers:")
scanf ("%d%d%d, &a, &b, &c");
result = a * b * c;
printf ("Result is %d", result);
	(4)
	int num , result=0;
	printf ("Enter the three digit number: ");
	scanf ("%d",&num);
	result = (num%10)*100+(num/10%10)*10+(num/100%10)*1;
	printf ("reverse number is: %03d\n", result);

Ans:

(1)	(2) Correct

if (gender==0)
printf("Male");
else
printf("Female\n");	

(3) int a,b,c,result;
printf("Enter three integers:");
scanf("%d%d%d", &a, &b, &c");
result = a*b*c;
printf("Result is %d",result);
	(4) Correct

3. (18pts) What will the following codes output?

(1) (5pts)

```
int main(){
    int i=1;
    while(i<=5){
        printf("%d ",i++);
        printf("%d\n",++i);
        i++;
    }
    return 0;
}
```

(2) (5pts)

```
int main(){
    int i=1;
    while(i<=5){
        printf("%d ",++i);
        printf("%d\n",i++);
        i++;
    }
    return 0;
}
```

(3) (8pts)

```
int main(){
    int x=4,y=0,total=0;
    while(x<=10){
        y=x*x;
        printf("%d\n",y);
        total+=y;
        ++x;
    }
    printf("Total is %d\n",total);
    return 0;
}
```

Ans:

(1)

1 3
4 6

(2)

2 2
5 5

(3)

16
25
36
49
64
81
100
Total is 371

4. (15pts) What output does the following C code produce?

```c
#include <stdio.h>
int main()
{
    int n,result,a1,a2,i=2;
    printf("Input n:");
    scanf("%d",&n);
    a2=0,a1=1;
    if(n==0) result=0;
    else if(n==1) result=1;
    else{
        while(i<=n){
            result=a2+a1;
            a2=a1;
            a1=result;
            i++;
        }
    }
    printf("%d\n",result);
    return 0;
}
```

(a) If the input is 0, what is the output?
Ans: 0
(b) If the input is 2, what is the output?
Ans: 1
(c) If the input is 5, what is the output?
Ans: 5
(d) If the input is 8, what is the output?
Ans: 21
(e) If the input is 11, what is the output?
Ans: 89

5. (16 pts total) Which of the following are **valid expressions** (**NOT necessarily to be useful**)?
(Hint: there can be more than one correct answer.)

```c
#include <stdio.h>
int main()
{
    int num1, num2;
    float num3, num4;

    A)  num1 = 5;
    B)  num3 = num1 * 3;
    C)  num4 + 1.0f = num1;
    D)  -num2 = num1;
    E)  num3 = num2 = num1 = 10.235f;
    F)  num4 = 2.345f + num2--;
    G)  num1 + num2 = 10;
    H)  num1 = num2 - num1 % 2 + 2;
    I)  num1 + num2 + num3 + num4; //Not useful but valid
    J)  num2 = ++num1 / 2;

    printf("%d, %03d, %.3f, %.2f", num1, num2, num3, num4);
    return 0;
}
```

(8 pts) Ans: _____
Ans: A, B, E, F, H, I, J
(8 pts) After execute the valid expressions in order (Please **ignore the invalid ones**), what are the output of this program?
Ans: _____
Ans: 12, 006, 10.000, 12.35