Recursion Day 1

APCS MC Practice

public int f1 (int a)

{

if (a <= 1){ return a; }

else { return a + something (a - 2); }

}

F1(1) =

F1(4) =

F1(8) =

public int f2 (int a)

{

if (a == 0) { return; }

else {

System.out.println(a);  
 f2(a-1);

{

}

f2(5) =

public int f3 (int a)

{

if (a == 0) { return; }

else {  
 f3(a-1);

System.out.println(a);

{

}

f3(5) =

8. What value is returned by the call something(4,6)? \_\_\_\_\_\_\_\_\_\_

(A) 4

(B) 6

(C) 24

(D) 1296

(E) 4096

public int something (int a, int b)

{

if (b <= 1)

{

return a;

}

else

{

return something (a, b-1);

}

}

11. For each call to the following method, indicate what value is returned.

public int mystery1(int x, int y)

{

if (x < y)

{

return x;

}

else

{

return mystery1(x - y, y);

}

}

mystery1(6,13) \_\_\_\_\_\_\_\_\_

mystery1(8,2) \_\_\_\_\_\_\_\_\_

mystery1(14,10) \_\_\_\_\_\_\_\_\_

13. For each call to the following method, indicate what value is returned.

public int mystery3(int n)

{

if (n < 0)

{

return -mystery3(-n);

}

else if (n < 10)

{

return n;

}

else

{

return mystery3(n / 10 + n % 10);

}

}

mystery3(6) \_\_\_\_\_\_\_\_\_

mystery3(17) \_\_\_\_\_\_\_\_\_

mystery3(-479) \_\_\_\_\_\_\_\_\_

14. For each call to the following method, indicate what value is returned.

public int mystery4(int n)

{

if (n < 0)

{

return mystery4(-n);

}

else if (n < 10)

{

return n;

}

else

{

return n % 10 + mystery4(n / 10);

}

}

mystery4(8) \_\_\_\_\_\_\_\_\_

mystery4(-52) \_\_\_\_\_\_\_\_\_

mystery4(3052) \_\_\_\_\_\_\_\_\_

19. For each call to the following method, indicate what console output is produced.

public void mystery8(int n)

{

if (n > 100)

{

System.out.print(n);

}

else

{

mystery8(2 \* n);

System.out.print(", " + n);

}

}

mystery8(113) \_\_\_\_\_\_\_\_\_

mystery8(70) \_\_\_\_\_\_\_\_\_

mystery8(42) \_\_\_\_\_\_\_\_\_

30. Consider the following recursive method: \_\_\_\_\_\_\_\_\_\_

public static void printStars (int k)

{

if (k>0)

{

printStars(k-1);

for (int j=1; j<=k; j++)

System.out.print(“\*”);

System.out.println();

}

}

What is the output as a result of the call printStars(4)?

(A) \*\*\*\* (D) \*

\*\*\* \*\*

\*\* \*\*\*

\*

(B) \* (E) \*

\*\* \*

\*\*\* \*

\*\*\*\* \*

(C) \*\*\*

\*\*

\*

31. Consider the following recursive method:

public int mystery (int k)

{

if (k == 1)

return 0;

else

return (1 + mystery (k/2);

}

What value is returned by the call mystery(16)?

(A) 0

(B) 2

(C) 4

(D) 5

(E) 16

33. Questions 33 and 34 refer to the following recursive method:

public static int compute (int x, int y)

{

if (x == y)

return x;

else

return (compute(x+1, y-1));

}

What is returned by the call compute(1,5)?

(A) 1

(B) 2

(C) 3

(D) 4

(E) No value is returned because infinite recursion occurs.

34. Which of the following calls leads to an infinite recursion?

I. compute(2,8)

II. compute (8,2)

III. compute (2,5)

(A) I only

(B) II only

(C) III only

(D) I and II

(E) II and III

36. Consider the following method:

public void mystery (int a, int b)

{

System.out.print (a + “ ”);

if (a <= b)

mystery (a + 5, b -1);

}

What is the output when mystery (0, 16) is called?

(A) 0

(B) 0 5

(C) 0 5 10

(D) 0 5 10 15

(E) 0 5 10 15 20

37. What is the output when smile(4) is called?

public static void smile (int n)

{

if (n==0)

return;

for (int k=1; k<=n; k++)

System.out.print(“smile!”);

smile(n-1);

}

(A) smile!

(B) smile!smile!

(C) smile!smile!smile!

(D) smile!smile!smile!smile!

(E) smile!smile!smile!smile!smile!smile!smile!smile!smile!smile!

42. Consider the following method:

public int getSomething(int value)

{

if(value < 1)

return 0;

else

return 1 + getSomething(value–1) + getSomething(value–2);

}

What is returned by the call getSomething(4)?

(A) 0

(B) 1

(C) 2

(D) 5

(E) 7

44. What is the output by the call fun (3)?

public void fun (int x)

{

if (x>=1)

{

System.out.print(x);

fun (x-1);

}

}

(A) 3 2 1

(B) 1 2 3

(C) 2 3

(D) 3 2 1 0

(E) Nothing will be printed due to an infinite recursion

49. What is the output by the call fun (3)?

public void fun (int x)

{

if (x<1)

{

System.out.print(x);

}

else

{

System.out.print(x);

fun (x-1);

}

}

(A) 3 2 1 0 3 2 1 0

(B) 3 2 1 0

(C) 3 2 1 0 0 1 2 3

(D) 0 1 2 3

(E) Nothing will be printed due to infinite recursion

56. Consider the following method:

//precondition: num>=0

public static void mystery (int num)

{

if (num >1)

mystery (num/2);

System.out.print(num%2);

}

What is the best postcondition for mystery?

(A) Reverses the digits of num

(B) Prints the remainder when num is divided by 2

(C) Prints one-half num

(D) Prints the square root of num.

(E) Prints the binary representation of num.