

**AP Computer Science
Quiz
October 11, 2005**

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|---------------------------|---|
| «Number» «Name» | "On my Honor, I have neither given nor received unauthorized aid of any kind on this assignment." |
| Name | Student signature |

1. Insert a statement to terminate the loop when the end of input is reached.

```

Scanner in = new Scanner(System.in);
boolean complete = false;
while(!complete)
{
    String input = in.next();
    if(input.equalsIgnoreCase("Q"))
        complete = true;
    else
    {
        double x = Double.parseDouble(input);
        data.add(x);
    }
}
  
```

2. Insert the missing statement in the following code fragment. Note that the loop exits when the user enters a valid response.

```

Scanner in = new Scanner(System.in);
double value;
do
{
    System.out.print("Enter a number greater than 1: ");
    value = in.nextDouble();
}
while(value <= 1);
  
```

| Raw Score | Total Points | Percentage | Letter Grade | Grade Points |
|-----------|--------------|------------|--------------|--------------|
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| | | | | |

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3. What value of x is printed after the nested loop? $1 + 2 + 4 + 3 + 6 + 9 = 25$

```
int x = 0;
for(int i = 0; i < 4; i++)
    for(int j = 0; j <= i; j++)
        x = x + i * j;
System.out.println(x);
```

| | | | | |
|---|---|---|---|---|
| i | 0 | 1 | 2 | 3 |
| j | 0 | 0 | 0 | 0 |
| | | 1 | 1 | 1 |
| | | | 2 | 2 |
| | | | | 3 |

4. a. What is the value of i for the first iteration? 100
b. What is the value of i for the last iteration? 2
c. How many times does the println statement execute? 99
d. What is the last value that is printed? 0

```
for (int i = 100; i > 1; i--)
    System.out.println( i - 2 );
```

5. Insert the missing statement in the following code fragment.

```
int years = 20;
while(years > 0)
{
    years--;
    double interest = balance * rate / 100;
    balance = balance + interest;
}
```

6. Name the three types of iterative loops that we have studied.

while Loop

do Loop or do-while Loop

for Loop

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7. What type of loop is guaranteed to execute at least once?

do Loop or do-while Loop

Why?

The condition is tested after the body is executed, so the body is executed at least once.

8. What type of loop should you use when the counter variable runs from start to end with a constant increment or decrement?

for Loop

What type of loop should you use when the above conditions are not met?

while Loop

9. Write another type of loop that is functionally equivalent to the following loop.

```
int i = start;           for (int i = start; i <= end; i++)
while (i <= end)        {
{                          System.out.println(i);
System.out.println(i);  }
i++;                     }
}
```

10. Use the most appropriate type of loop to calculate the sum of the powers of two that are less than 200 ($1 + 2 + \dots + 64 + 128$). Create and initialize a local variable of type double named “sum”. Use `Math.pow(2, i)` to calculate 2 raised to the i-th power.

```
double sum = 0;
for (int i = 0; Math.pow(2, i) < 200; i++)
    sum = sum + Math.pow(2, i);
```

```
double sum = 0;   int i = 1;
while (i < 200)
{
    sum = sum + i;   i = i * 2;
}
```

Using your knowledge of binary mathematics, what is the final value of sum?

$1 + 2 + 4 + 8 + 16 + 32 + 64 + 128 = 256 - 1 = 255.0$

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