Panel 1

CSAS III - Review

✓ Programming Language, Source Code
✓ Compiling and Executing a program
✓ Basic Data Types, Strings, Binary #’s
✓ Assignment and Arithmetic
✓ Conditional Execution, Loops
✓ Input and Output
✓ Methods and Parameters
✓ Fields and Scope
✓ Arrays
✓ Program Design

Panel 2

BONUS

1. Describe the complete process of creating and executing a working program. In other words, how is the source code file created, what names must be used, how is the class file created, and how is the class file executed.

   Name.java contains source code in Java

   Compile: Name.java -> Name.class

   Execute: Name.class

   "java Name" from C:\ (DOS Box)
Panel 3

1. Convert the numbers 321 and 333 to their binary representations, and the numbers (010010001)₂ and (11011011)₂ to their usual representation.

\[
\begin{array}{cccccc}
128 & 64 & 32 & 16 & 8 & 2 & 1 \\
\hline
1 & 1 & 0 & 1 & 0 & 0 & 0 \\
\end{array}
\]

\[1 + 0 + 1 + 0 = 128 + 0 + 0 + 0 = 128\]

Panel 4

1. What is the value of z at the end of this code fragment?

```java
int z = 23;
int x = 7, y = 53;

x *= y;
y /= 2;
x++;
z += (x + y);

x = 5;
y = 9;
z = 2;

boolean r = false, result;
result = !(x | (y < x)) && (5 >= x);
result = (x + y) >= (16 - z);
```

\[x = \text{X} \ 3 \ 3 \ 2 \ 5 \quad x + y = 398 + 13 = 411\]

\[y = \text{X} \ 2 \ 6 \ 9\]

\[t = \text{X} \ 4 \ 1 \ 2\]
1. Write a program that has three double variables containing some values and prints to
the screen the mathematical \textit{sine} of the first one, the \textit{cosine} of the second one, and the
\textit{tangent} of the third number. Also display the sum of the squares of \textit{sine} and \textit{cosine} of
the three double numbers.

```java
public class Bert {
    public static void main(String args[3]) {
        double x = 10.2, y = 2.0, z = 3.0;
        System.out.println(Math.sin(x));
        System.out.println(Math.cos(y));
        System.out.println(Math.tan(z));
        System.out.println(Math.pow(Math.sin(x), 2) + Math.pow(Math.cos(y), 2));
    }
}
```

5

Panel 6

a) what is the value of \( x, y, \) and \( z \) if \( x = 4, y = 9, z = \text{false} \).

```java
int x, y; /\nboolean z; /

if (x > 3)
{  z = true;
    x = 7;
    y *= 4;
}
else if (x == 4)
{  z = false;
    x = 9;
}
else
{  z = true;
    y = 8;
}

double xx = 32;
while (xx > 1.0)
{  xx /= 2;
    System.out.println("xx = " + xx);
}
```

6
Panel 7

1. Write a program that displays all numbers divisible by 4 between 1 and 100 using a for loop.

```java
for (int i = 1; i <= 100; i++)
{
    if (i % 4 == 0)
    {
        System.out.println(i);
    }
}
```

or

```java
for (int i = 4; i <= 100; i+=4)
{
    System.out.println(i);
}
```

Panel 8

1. Describe the difference (for strings) between "==" and ".equals" and "+=

\[
== \text{ equality, = assignment}
\]

\[
\text{.equals checks if elements are same in some position}
\]

1. Create a program that displays a string in reverse order, one character per line, to the screen.

```java
for (int i = s.length()-1; i >= 0; i--)
{
    System.out.println(s.charAt(i));
}
```
1. Describe, in your own words:
   a) why methods are useful.
   b) how to define a method
   c) the difference between the body of a class, the body of a method, and the header of a method.

```java
public class X

5) public static RebarType rename (input list) {
   { internal blah
   } body
   method
}
```

Panel 10

```java
public static void methodA(int i)
{ // stuff }

public static double methodB(char c, double x)
{ // stuff }
```

Give an example how you would call each method.

```java
methodB(1);

double x = methodB('c', 2.3);
```
Panel 11

Panel 12

1. Describe, in your own words:
   a. the difference between a field variable and a local variable
   b. when to use fields and when to use local variables
   c. why local variables are important
   d. why fields are important
   e. the scope of a field
   f. the scope of a local variable

   f. from its declaration to end of block it's declared in.

   for (int i = 1; i < 10; i++)
   
   double z = i / 2.0;
   
   System.out.println(z);
   System.out.println(i);
Panel 13

```java
public class FlavoredScope
{
    public static int x = 4;
    public static int y = 8;
    public static int z = 2;

    public static void mints(int x, int z, int y)
    {
        winterfresh(y, z);
        x = peppermint(y);
        System.out.println(x);
        System.out.println(y);
        System.out.println(z);
    }

    public static void winterfresh(int x, int y)
    {
        int z = -1;
        x = y + z;
    }

    public static int peppermint(int y)
    {
        y *= z;
        return y;
    }

    public static int cherry(int y, int z, int x)
    {
        x = y/4;
        y = y + x;
        z *= y;
        return z;
    }

    public static void main(String args[])
    {
        mints(x, y, cherry(y, z, x));
        System.out.println(x);
        System.out.println(y);
        System.out.println(z);
    }
}
```

Panel 14

1. What is the exact syntax:
   a. to declare an array of five integersto declare an array without initializing it
   b. to declare an array containing the following three strings: “Java” “Is” “Fun”
   c. to specify the size of an array that was not initialized
   d. to get the value from an array element
   e. to create a method with an array as input type
   f. to call a method that uses an array as an input type
   g. to find the length of an array

HW
1. If an array is of size 25, what are the index numbers to access the elements of the array?
   a) 0-24
   b) 1-25
   c) 2-26
   d) 3-27
   e) 4-28

1. Consider the following code segment:
   ```java
   int A[] = new int[10];
   A[0] = 1;
   A[1] = 2;
   for (int i = 2; i < A.length; i++)
   {  if ((i & 2) == 1)
     else
       A[i] = 2 * A[i-1];
   }
   ```
   Recall that \((i \& 2)\) returns 0 if \(i\) is even and 1 if \(i\) is odd. What is the value of \(A[4]\) after the above code segment executes? How about \(A[9]\)? What about \(A[10]\)?