Original Program:

```c
int A(int X)
{
    X = 12345;
    return X;
}

void B {
    int X, Y;
    Y = 0;
    while (25 > Y)
    {
        Y = Y + 1;
    }
    printStr("Y="); printInt(Y);
    X = A(Y);
    printInt(X); println();
}
```

Symbol table at end of parsing:

<table>
<thead>
<tr>
<th>ST Locn</th>
<th>NAME</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A</td>
<td>Procedure</td>
</tr>
<tr>
<td>2</td>
<td>X</td>
<td>Integer parm</td>
</tr>
<tr>
<td>3</td>
<td>B</td>
<td>Procedure</td>
</tr>
<tr>
<td>4</td>
<td>X</td>
<td>Integer</td>
</tr>
<tr>
<td>5</td>
<td>Y</td>
<td>Integer</td>
</tr>
<tr>
<td>6</td>
<td>T1</td>
<td>Label</td>
</tr>
<tr>
<td>7</td>
<td>T2</td>
<td>Integer temp</td>
</tr>
<tr>
<td>8</td>
<td>T3</td>
<td>Label</td>
</tr>
<tr>
<td>9</td>
<td>T4</td>
<td>Integer temp</td>
</tr>
<tr>
<td>10</td>
<td>L1</td>
<td>String literal</td>
</tr>
</tbody>
</table>

Program with quad output:

Note: If the virtual machine executed these quads, then compilation would be completed. However, since the machine doesn’t, the code generator must convert each quad into a sequence of instructions that has the same effect:

```c
return X;)
    <RETURN, 0, 0, 2>
    <ENDPROC, 0, 0, 0>

void B
    <NEWPROC, 3, 0, 0>
    <STARTPROC, 0, 0, 0>
    {INT X,
        Y;
        X = A(Y);
        printInt(X); println();
    }
```

Address 2

- Return of value X
- End of procedure A
- Start of procedure B
- Start of Decl part of B
- No quads - only symbol table
- Assign of 0 to Y
- Loop back to top of while
- Compute 25 > Y, Save in T2
- Test while expr and Jump to T3 (if false)
- Y + 1 stored in T4
- Y + 1 stored in Y
- Jump to top of while stmt
- Jump here if ifTest is false
- Write literal
- Write Y
- Argument Y to procedure
- Call function i (Y) with 1 argument
- Save for value Y in X
- Write Y
- Write new-line
- End of procedure B

int A (int X)
    <NEWPROC, 1, 0, 1>
    <PARAM, 2, 0, 0>
    <STARTPROC, 0, 0, 0>
    {X = 12345;
        <=, 12345, 0, 2>
    <RETURN, 0, 0, 2>
    <ENDPROC, 0, 0, 0>

Note: Need to differentiate integer 12345 and symbol table