

Unit 3: Computational Logic

In this unit, you will use CodePuppy to learn about:

1. How to write code to interact with control systems
2. How to write selection and iteration statements
3. How to use variables to control system flow

Exercise 1

Enter and run the following code:

```
OUTPUT1 = 1
```

Study Drills

1. Write a program to turn on OUTPUT2
2. Write a program to turn on OUTPUT1 and OUTPUT2
3. Write a program to turn on OUTPUT1 and OUTPUT3
4. Write a program to turn on all of the OUTPUTs

Exercise 2

Enter and run the following code:

```
ROTOR1 = 1
```

Study Drills

1. Write a program to make ROTOR1 turn faster
2. Write a program to make ROTOR1 turn slower
3. Write a program to make ROTOR1 turn ANTICLOCKWISE
4. Write a program to make ROTOR2 turn CLOCKWISE and ROTOR1 turn ANTICLOCKWISE
5. Write a program to make ROTOR1 and ROTOR2 turn CLOCKWISE
6. Write a program to make ROTOR1 turn at half the speed of ROTOR2
7. Write a program to make ROTOR1 turn at four times the speed of ROTOR2

Exercise 3

Enter and run the following code:

```
MATRIX[1][1] = 1
```

Study Drills

1. Write a program to turn on eight lights to make a diagonal line from the top left of the matrix to the bottom right
2. Write a program to turn on eight lights to make a diagonal line from the top right of the matrix to the bottom left
3. Write a program to turn on the lights to make a cross
4. Write a program to turn on the lights to make a border around the matrix

Exercise 4

Enter and run the following code:

```
if (INPUT1 == 1) {  
    OUTPUT1 = 1  
} else {  
    OUTPUT1 = 0  
}
```

Study Drills

1. Write a program to turn on OUTPUT2 when INPUT1 is turned ON
2. Write a program to turn on OUTPUT1 and OUTPUT2 when INPUT1 is ON
3. Write a program to turn on OUTPUT1 and OUTPUT2 when INPUT1 is ON AND Turn on OUTPUT3 and OUTPUT4 when INPUT2 is ON
4. Write a program to turn on ROTOR1 when INPUT4 is ON

Exercise 5

Enter and run the following code:

```
if (INPUT1 = 1 and INPUT2 = 1) {  
    OUTPUT1 = 1  
} else {  
    OUTPUT1 = 0  
}
```

Study Drills

1. Write a program to turn on OUTPUT2 when INPUT3 and INPUT4 are on
2. Write a program to turn on OUTPUT1 when all of the INPUTs are on
3. Write a program to turn on ROTOR1 when INPUT1 and INPUT2 are on
4. Write a program to turn on all of the lights in the first two columns of the MATRIX when INPUT1 is on, all of the lights in column three and four when INPUT2 is on, etc

Exercise 6

Enter and run the following code:

```
for (x in range(8)) {  
    MATRIX[x][x] = 1  
}
```

Study Drills

1. Use iteration to turn on all of the lights in the top row of the matrix
2. Use iteration to turn on all of the lights in the left-most column of the matrix
3. Use iteration to make an “X” out of the lights in the matrix
4. Use iteration to turn on ALL of the lights in the matrix
5. Use iteration to turn on all of the lights in the matrix except for the lights in the corners
6. Write a program to draw an X when INPUT1 is on, a box when INPUT2 is on, and a diamond when INPUT3 is on