



# The Switch Statement

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- An optimized form when you need to check for one of several values.

Gauge	Rho
12	5.211
14	8.285
16	13.170
18	20.950

- Merge multiple if ... else ... statements into a single compound statement.



# The **switch** Statement

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- A switch statement can replace a series of “if” ... “else”... statements

```
switch (gauge)
{
    case 12:
        rho = 5.211; break;
    case 14:
        rho = 8.285; break;
    case 16:
        rho = 13.17; break;
    case 18:
        rho = 20.95; break;
    default:
        printf ("Invalid gauge\n");
}
```

- The compiled code compares gauge to each “case” in turn.
- When an equal value is found, execute the corresponding code.
- If no equal value is found, execute the default code.
  - If no default, just continue below the block.




# The switch Statement

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Example: Suppose gauge is 16.

```
switch (gauge)
{
    case 12:
        rho = 5.211; break;
    case 14:
        rho = 8.285; break;
    case 16:
        rho = 13.17; break;
    case 18:
        rho = 20.95; break;
    default:
        printf ("Invalid gauge\n");
}

/* Continue here. */
```



```
#include <stdio.h>
```

```
int main()
```

```
{
```

```
    int gauge;
```

```
    double rho;
```

```
    printf ("Enter wire gauge (12, 14, 16, or 18): ");
```

```
    scanf("%d", &gauge);
```

```
    switch (gauge)
```

```
    {
```

```
        case 12:
```

```
            rho = 5.211;    break;
```

```
        case 14:
```

```
            rho = 8.285;    break;
```

```
        case 16:
```

```
            rho = 13.17;    break;
```

```
        case 18:
```

```
            rho = 20.95;    break;
```

```
        default:
```

```
            printf ("Invalid gauge %d\n", gauge);
```

```
            return 1;
```

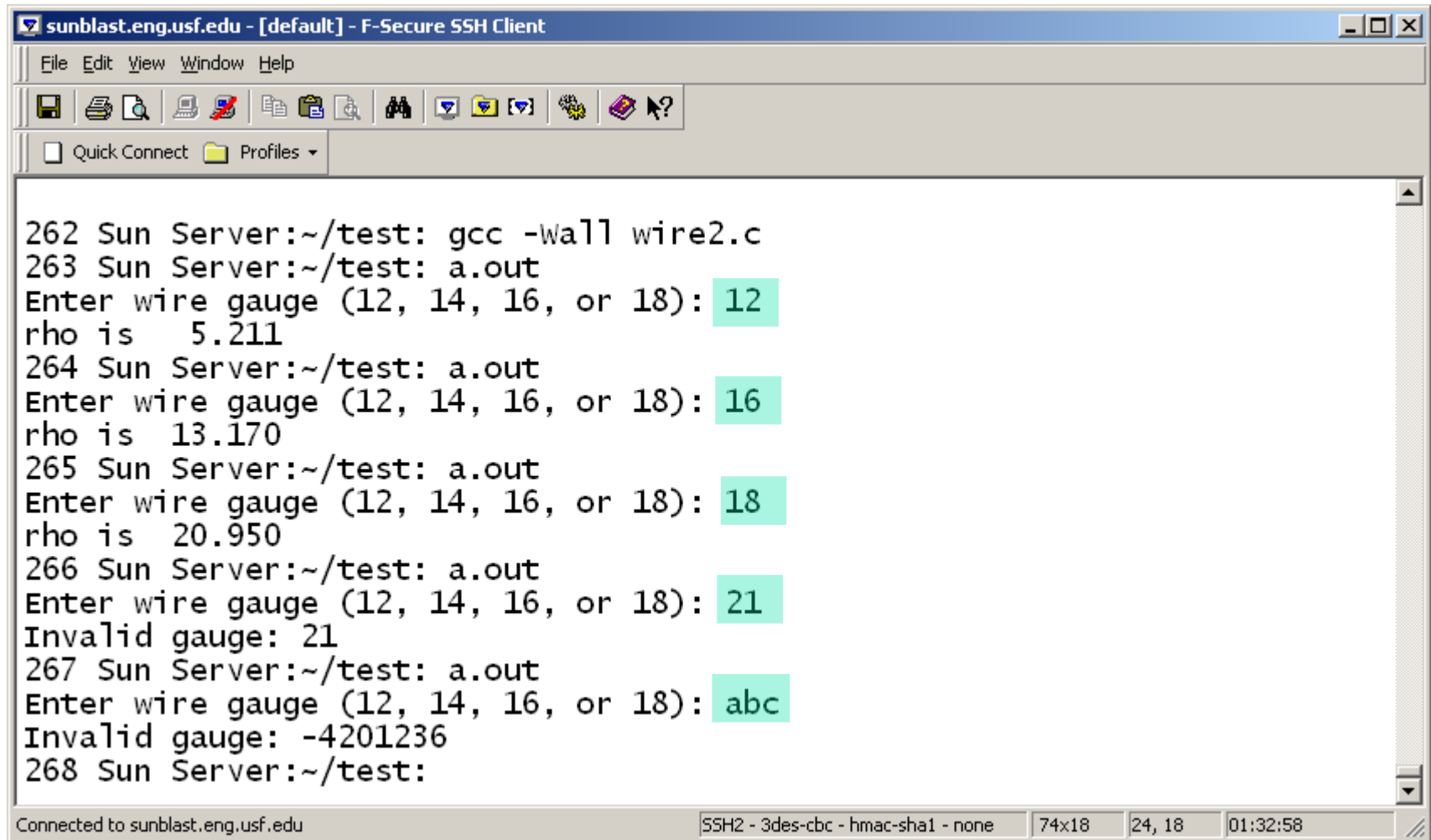
```
    }
```

```
    printf ("rho is %7.3f\n", rho);
```

```
    return 0;
```

```
}
```

# Program wire2.c Running



The image shows a screenshot of an F-Secure SSH Client window. The title bar reads "sunblast.eng.usf.edu - [default] - F-Secure SSH Client". The menu bar includes "File", "Edit", "View", "Window", and "Help". The toolbar contains icons for file operations and network settings. Below the toolbar, there are checkboxes for "Quick Connect" and a "Profiles" dropdown. The main text area displays the following terminal output:


```
262 Sun Server:~/test: gcc -Wall wire2.c
263 Sun Server:~/test: a.out
Enter wire gauge (12, 14, 16, or 18): 12
rho is 5.211
264 Sun Server:~/test: a.out
Enter wire gauge (12, 14, 16, or 18): 16
rho is 13.170
265 Sun Server:~/test: a.out
Enter wire gauge (12, 14, 16, or 18): 18
rho is 20.950
266 Sun Server:~/test: a.out
Enter wire gauge (12, 14, 16, or 18): 21
Invalid gauge: 21
267 Sun Server:~/test: a.out
Enter wire gauge (12, 14, 16, or 18): abc
Invalid gauge: -4201236
268 Sun Server:~/test:
```

The status bar at the bottom shows "Connected to sunblast.eng.usf.edu", "SSH2 - 3des-cbc - hmac-sha1 - none", "74x18", "24, 18", and "01:32:58".



## A common mistake:

```
switch (gauge)    No break
{
    case 12:
        rho = 5.211;
    case 14:
        rho = 8.285;
    case 16:
        rho = 13.17;
    case 18:
        rho = 20.95;
    default:
        printf ("Invalid gauge\n"); return 1;
}
```





## Fall Through

What happens if there is no break at the end of the code for a case?

Answer: the code in the following case statement will be executed

This will continue until we reach a break statement or until we reach the end of the switch statement.

## Fall through:

```
switch (gauge)
{
    case 12:    rho = 5.211;
    case 14:    rho = 8.285;
    case 16:    rho = 13.17;
    case 18:    rho = 20.95; break;
    default:    printf ("Invalid gauge\n");
                return 1;
}
```

} No break

If gauge has value 12, 14, 16 or 18, rho will end up with value 20.95



# The **switch** Statement

---

If the switch statement is inside a function, you can use “return” instead of “break”.

```
switch (gauge)
{
    case 12: rho = 5.211;    return rho;
    case 14: rho = 8.285;    return rho;
    case 16: rho = 13.17;    return rho;
    case 18: rho = 20.95;    return rho;
    default: printf ("Invalid gauge\n");
              abort();
}

/* Never reach this point. */
```

## Programming Style Issues

A switch statement should look like a table.

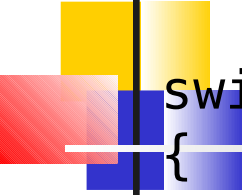
The entire block should be visible on your screen at the same time.

Keep it simple.

You can include multiple statements for a case.

But only a few.

Use a function if you need to do more.



```
switch (gauge)
```

---

```
{  
    case 12:  
        rho = 5.211;  
        phi = 3.457;  
        break;  
    case 14:  
        rho = 8.285;  
        phi = 4.657;  
        break;  
    case 16:  
        rho = 13.17;  
        phi = 8.381;  
        break;  
    case 18:  
        rho = 20.95;  
        phi = 12.45;  
        break;  
    default:  
        printf ("Invalid gauge\n");  abort();  
}
```