

# Programming with C I

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# Figure Function comp\_tax

```
/*
 * Computes the tax due based on a tax table.
 * Pre : salary is defined.
 * Post : Returns the tax due for  $0.0 \leq \text{salary} \leq 150,000.00$ ;
 *        returns -1.0 if salary is outside the table range.
 */
double comp_tax(double salary)
{
    double tax;

    if (salary < 0.0)
        tax = -1.0;
    else if (salary < 15000.00)                /* first range */
        tax = 0.15 * salary;
    else if (salary < 30000.00)              /* second range */
        tax = (salary - 15000.00) * 0.18 + 2250.00;
    else if (salary < 50000.00)             /* third range */
        tax = (salary - 30000.00) * 0.22 + 4950.00;
    else if (salary < 80000.00)            /* fourth range */
        tax = (salary - 50000.00) * 0.27 + 9350.00;
    else if (salary <= 150000.00)         /* fifth range */
        tax = (salary - 80000.00) * 0.33 + 17450.00;
    else
        tax = -1.0;

    return (tax)
}
```

# The switch statement

- 🛡️ also used to select one of several alternatives
- 🛡️ useful when the selection is based on the value of
  - a single variable
  - or a simple expression ← **controlling expression**
- 🛡️ values may be of type int or char
  - not double

# Syntax

```
switch (controlling expression) {  
    label set1  
        statements1  
        break;  
    label set2  
        statements2  
        break;  
    .  
    .  
    .  
    label setn  
        statementsn  
        break;  
}
```

# Figure Program Using a *switch* Statement for Selection

```
/*
 * Reads serial number and displays class of ship
 */

#include <stdio.h>

int
main(void)
{
    char class;                                /* input - character indicating class of ship */

    /* Read first character of serial number */
    printf("Enter ship serial number>");
    scanf("%c", &class);                       /* scan first letter */

    /* Display first character followed by ship class */
    printf("Ship class is %c: ", class);
    switch (class) {
    case 'B':
    case 'b':
        printf("Battleship\n");
        break;
```

*(continued)*

# Figure Program Using a *switch* Statement for Selection

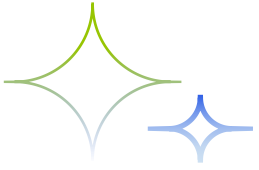
```
case 'C':  
case 'c':  
    printf("Cruiser\n");  
    break;  
case 'D':  
case 'd':  
    printf("Destroyer\n");  
    break;  
case 'F':  
case 'f':  
    printf("Frigate\n");  
    break;  
default:  
    printf("Unknown\n");  
}  
  
return (0);  
}
```

## Sample Run 1

Enter ship serial number> f  
ship class is f: Frigate

## Sample Run 2

Enter ship serial number> P  
ship class is P: Unknown



# THE END

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