Lab05

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Outline

- && / ||
- if/else if/else
- while
- Exercises
&&

- `expr1 && expr2 && ... && exprN`
  - evaluates to true only if all of the expressions are true; otherwise it evaluates to false.

- `int x = 5`

  - `x > 3 && x < 8 --- evaluates to true`
  - `x > 3 && x > 8 --- evaluates to false`
expr1 || expr2 || … || exprN
- evaluates to true if at least one of the expressions is true;
  evaluates to false if all of the expressions are false.

int x = 5
- x > 3 || x < 8 --- evaluates to true
- x < 3 || x > 8 --- evaluates to false
```cpp
int main() {
    int x = 25;
    if(x >= 20) {
        cout << ">= 20" << endl;
    } else if(x > 10) {
        cout << "> 10 but < 20" << endl;
    } else {
        cout << "<= 10" << endl;
    }
    return 0;
}
```

[dzhang@venus CS111]$ ./a.out
>= 20
[dzhang@venus CS111]$
Infinite loop

```cpp
int main() {
    while(true) {
        cout << "hello" << endl;
    }
    return 0;
}
```
Infinite loop

```c++
int main() {
    x = 1;
    while(x < 10) {
        cout << "hello" << endl;
    }
    return 0;
}
```
while loop

• The following program prints numbers 1 to 25.

```cpp
int main() {
    int x = 1;
    while(x <= 25) {
        cout << x << " ";
        x++;
    }
    return 0;
}
```
Exercise 1

- Write a program that outputs the numbers 1 to 25, with 5 numbers per line.

1 2 3 4 5
6 7 8 9 10
11 12 13 14 15
16 17 18 19 20
21 22 23 24 25
Exercise 2

- Modify your program so that numbers align vertically.

1  2  3  4  5
6  7  8  9 10
11 12 13 14 15
16 17 18 19 20
21 22 23 24 25
Exercise 3

- Modify your program so that it outputs a “*” at the end of each line.

1 2 3 4 5 *
6 7 8 9 10 *
11 12 13 14 15 *
16 17 18 19 20 *
21 22 23 24 25 *
Exercise 4

The following is a grade sheet. Create a program that asks the user to input a score, then the program calculates and outputs corresponding grade.

- Score is an integer between 0 and 100.
- If the user input a number that is less than 0 or greater than 100, the program should print “invalid input!”.
Exercise 4

<table>
<thead>
<tr>
<th>score</th>
<th>grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>$90 \leq \text{score} \leq 100$</td>
<td>A</td>
</tr>
<tr>
<td>$80 \leq \text{score} \leq 89$</td>
<td>B</td>
</tr>
<tr>
<td>$70 \leq \text{score} \leq 79$</td>
<td>C</td>
</tr>
<tr>
<td>$0 \leq \text{score} \leq 69$</td>
<td>F</td>
</tr>
</tbody>
</table>