

3. Program Set 2

1. Test out relational operators

```
#include <iostream>
int main() {
    int x, y;
    std::cout << "Enter x y: ";
    if (!(std::cin >> x >> y)) return 0;

    std::cout << "(x > y) = " << (x > y) << "\n";
    std::cout << "(x < y) = " << (x < y) << "\n";
    std::cout << "(x == y) = " << (x == y) << "\n";
    std::cout << "(x != y) = " << (x != y) << "\n";
    std::cout << "(x > 0 && y > 0) = " << (x > 0 && y > 0) << "\n";
    std::cout << "!(x == 0) = " << !(x == 0) << "\n";
}
```

2. Truthiness in single values

```
#include <iostream>

int main() {
    int n;

    std::cout << "Enter any integer: ";
    std::cin >> n;

    if (n)
        std::cout << "This counts as TRUE (non-zero)." << std::endl;
    else
        std::cout << "This counts as FALSE (zero)." << std::endl;

    return 0;
}
```

3. Switch-case example

```
#include <iostream>

int main() {
    int choice;
    std::cout << "1) Tea  2) Coffee  3) Juice  9) Exit";
    std::cout << std::endl << "Choice: ";
    std::cin >> choice;

    switch (choice) {
        case 1:
            std::cout << "Tea selected\n";
            break;
        case 2:
        case 3:
            std::cout << "Coffee or Juice!\n";
            break;
        case 9:
            std::cout << "Goodbye!\n";
            break;
        default:
            std::cout << "Unknown option\n";
    }

    return 0;
}
```

4. while example

```
#include <iostream>

int main() {
    int x = 0;

    while (x < 5)
    {
        x = x + 1;
    }

    std::cout << "x is " << x << "\n";
}
```

5. do-while example

```
#include <iostream>

int main() {
    int n;
    do {
        std::cout << "Enter a number between 1 and 10: ";
        std::cin >> n;
    } while (n < 1 || n > 10);

    std::cout << "You chose " << n << "\n";

    return 0;
}
```

6. for-loop example

```
#include <iostream>

int main() {
    for (int i = 0; i < 10; i++)
    {
        std::cout << i << (i == 9 ? '\n' : ' ');
    }
}
```

7. Nested if example

```
#include <iostream>

int main() {
    int x, y;

    std::cout << "x y: ";
    std::cin >> x >> y;

    if (x > y)
    {
        std::cout << "x > y\n";
        if (x == 6)
            std::cout << "Also, x == 6\n";
        else
            std::cout << "Also, x != 6\n";
    }
    else
        std::cout << "x <= y\n";
}
```

```
    return 0;
}
```

8. Rock-paper-scissors

```
#include <iostream>
#include <cstdlib>
#include <ctime>

int main() {
    std::srand(static_cast<unsigned>(std::time(nullptr)));

    std::cout << "Enter your move (r/p/s): ";
    char you;
    std::cin >> you;
    int comp = std::rand() % 3;
    std::cout << std::rand() << std::endl;
    char mv[3] = {'r', 'p', 's'};
    char c = mv[comp];

    std::cout << "Computer: " << c << std::endl;
    if (you == c)
        std::cout << "Draw" << std::endl;
    else if ((you=='r' && c=='s') || (you=='p' && c=='r') ||
              (you=='s' && c=='p'))
        std::cout << "You win!" << std::endl;
    else
        std::cout << "You lose!" << std::endl;

    return 0;
}
```

9. Number guess

```
#include <iostream>
#include <cstdlib>
#include <ctime>

int main() {
    std::srand(static_cast<unsigned>(std::time(nullptr)));

    int target = 1 + std::rand() % 100;

    std::cout << "Guess my number (1..100)" << std::endl;
```

```

    int tries = 0, x;

    for (std::cout << "Your guess: "; std::cin >> x; std::cout <<
        "Your guess: ")
    {
        ++tries;
        if (x < target)
            std::cout << "Too low!" << std::endl;
        else if (x > target)
            std::cout << "Too high!" << std::endl;
        else
        {
            std::cout << "Correct in " << tries << " tries." << std::endl;
            break;
        }
    }
}

```

10. Number base converter

```

#include <iostream>
#include <string>

int main()
{
    unsigned long n;
    int base;
    std::cout << "Enter a non-negative integer and base (2, 8, or 16):
";
    std::cin >> n >> base;
    if (!(base == 2 || base == 8 || base == 16))
    {
        std::cout << "Base must be 2, 8, or 16.\n";
        return 0;
    }

    if (n == 0)
    {
        std::cout << "0\n"; return 0;
    }

    std::string out;
    while (n > 0)
    {
        int r = int(n % base);

```

```
    char ch = r < 10 ? char('0' + r) : char('A' + (r - 10));  
    out += ch; // build the result in reverse  
    n /= base;  
}  
  
// print the reverse result which is itself in reverse  
for (int i = int(out.size()) - 1; i >= 0; --i)  
    std::cout << out[i];  
  
std::cout << "\n";  
  
return 0;  
}
```
