pyramid2.cpp

A context for demonstrating bulletproof code

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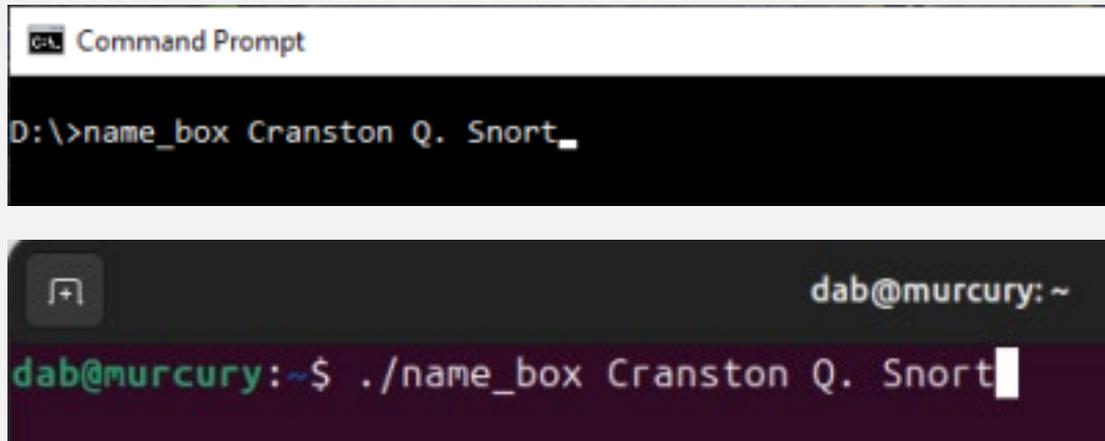
COMMAND LINE INPUT

int main(int argc, char* argv[])
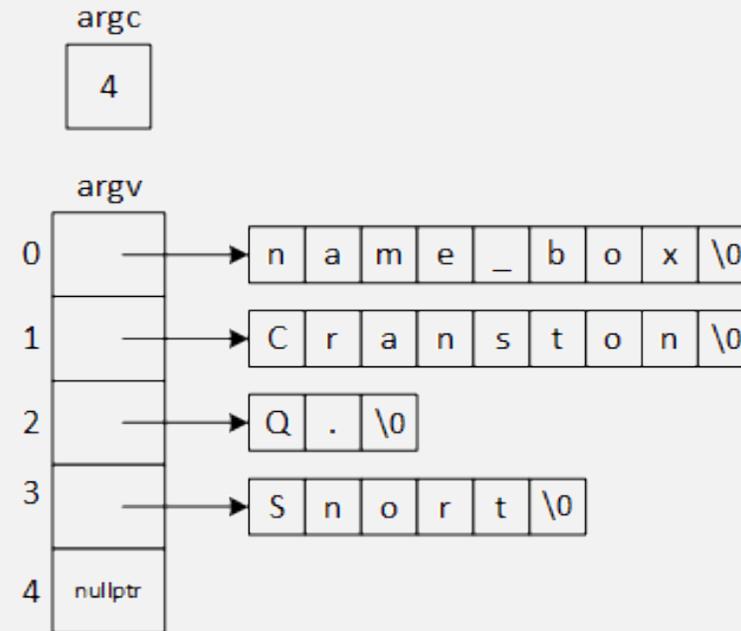
COMMAND LINE INPUT

```
#define HEIGHT 20

int main()
{
    for (int level = 0;
        level < HEIGHT; level++)
            . . .
}
```

```
int main(int argc, char* argv[])
{
    int height = atoi(argv[1]);

    for (int level = 0;
        level < height; level++)
            . . .
}
```

VALIDATING INPUT

- Bulletproof code

  - Detects errors

  - Displays diagnostics

  - Avoids failures

```
if (argc != 2)
{
    cerr << "USAGE: pyramid <height>" << endl;
    exit(1);
}

int height = atoi(argv[1]);
```

VALIDATING INPUT TYPE

```
if (argc != 2)
{
}

for (size_t i = 0; i < strlen(argv[1]); i++)
    if (! isdigit(argv[1][i]))
    {
        cerr << "Invalid integer: " << argv[1] << endl;
        exit(2);
    }

int height = atoi(argv[1]);
```

VALIDATING INPUT BOUNDS

```cpp
int height = atoi(argv[1]);

if (height < 0 || height > 20)
{
    cerr << "Height is out of bounds" << endl;
    exit(3);
}
```

```cpp
char input[10];

if (argc != 2)
{
    cout << "Please enter the pyramid height: ";
    cin.getline(input, 10);
}
else
    strcpy(input, argv[1]);

for (size_t i = 0; i < strlen(input); i++)
    if (! isdigit(input[i]))
    {
        cerr << "Invalid integer: " << input << endl;
        exit(1);
    }

int height = atoi(input);
```

FLEXIBLE
INPUT

COMMAND LINE INPUT
TO string OBJECTS

```cpp
string input;

if (argc != 2)
{
    cout << "Please enter the pyramid height: ";
    getline(cin, input);
}
else
    input = argv[1];
        . . .
int height = stoi(input);
```