



Exception Handling

Exception Handling is implemented using a Try...Throw...Catch block. Exception handling is used to detect and report error conditions and perform any type of recovery or program exit as required.

The Try...Throw...Catch Block

Any code that can fail should be placed in a Try...Throw...Catch block so that the program can handle the error instead of the program failing with a run-time error. A common exception that should be detected and processed is an attempted divide by zero.

No Exception Handling

```
// AverageScore.cpp - no exception handling
//
#include <iostream>
using namespace std;
int main (int argc, char* argv[])
{
    int TotalScore;
    int Participants;
    int AverageScore;

    cout << "Enter the Total of the Scores: ";
    cin >> TotalScore;
    cout << "Enter the number of participants: ";
    cin >> Participants;

    AverageScore = TotalScore / Participants;
    cout << "The Average Score is " << AverageScore << endl;

    return 0;
}
```



```
Enter the Total of the Scores: 100
Enter the number of participants: 5
The Average Score is 20
```

No Exception Handling

```
// AverageScore.cpp - no exception handling
//
#include <iostream>
using namespace std;
int main (int argc, char* argv[])
{
    int TotalScore;
    int Participants;
    int AverageScore;

    cout << "Enter the Total of the Scores: ";
    cin >> TotalScore;
    cout << "Enter the number of participants: ";
    cin >> Participants;

    AverageScore = TotalScore / Participants;
    cout << "The Average Score is " << AverageScore << endl;

    return 0;
}
```



```
Enter the Total of the Scores: 100
Enter the number of participants: 5
The Average Score is 20
```

No Exception Handling

```
// AverageScore.cpp - no exception handling
//
#include <iostream>
using namespace std;
int main (int argc, char* argv[])
{
    int TotalScore;
    int Participants;
    int AverageScore;

    cout << "Enter the Total of the Scores: ";
    cin >> TotalScore;
    cout << "Enter the number of participants: ";
    cin >> Participants;

    AverageScore = TotalScore / Participants;
    cout << "The Average Score is " << AverageScore << endl;

    return 0;
}
```

```
Enter the Total of the Scores: 100
Enter the number of participants: 5
The Average Score is 20
```



```
AverageScore = TotalScore / Participants;
cout << "The Average Score is " << AverageScore << endl;
```

No Exception Handling

```
// AverageScore.cpp - no exception handling
//
#include <iostream>
using namespace std;
int main (int argc, char* argv[])
{
    int TotalScore;
    int Participants;
    int AverageScore;

    cout << "Enter the Total of the Scores: ";
    cin >> TotalScore;
    cout << "Enter the number of participants: ";
    cin >> Participants;

    AverageScore = TotalScore / Participants;
    cout << "The Average Score is " << AverageScore << endl;
    return 0;
}
```

Enter the Total of the Scores: 100
 Enter the number of participants: 5
 The Average Score is 20

Enter the Total of the Scores: 100
 Enter the number of participants: 0
 Floating point exception
 Program exited abnormally

$\frac{100}{0}$ Illegal
 divide
 by 0

With Exception Handling – No Error

```
int TotalScore;
int Participants;
int AverageScore;

cout << "Enter the Total of the Scores: ";
cin >> TotalScore;
cout << "Enter the number of participants: ";
cin >> Participants;

try
{
    if (Participants < 1)
        throw 0;
    AverageScore = TotalScore / Participants;
    cout << "The Average Score is " << AverageScore << endl;
}
catch (int errID)
{
    cerr << "Error: " << errID << endl;
    cerr << "Participants can not be less than 1" << endl;
}
```

With Exception Handling – No Error

```

int TotalScore;
int Participants;
int AverageScore;

cout << "Enter the Total of the Scores: ";
cin >> TotalScore;
cout << "Enter the number of participants: ";
cin >> Participants;

try
{
    if (Participants < 1)
        throw 0;
    AverageScore = TotalScore / Participants;
    cout << "The Average Score is " << AverageScore << endl;
}
catch (int errID)
{
    cerr << "Error: " << errID << endl;
    cerr << "Participants can not be less than 1" << endl;
}

```

With Exception Handling – No Error

```

int TotalScore;
int Participants;
int AverageScore;

cout << "Enter the Total of the Scores: ";
cin >> TotalScore;
cout << "Enter the number of participants: ";
cin >> Participants;

try
{
    if (Participants < 1)
        throw 0;
    AverageScore = TotalScore / Participants;
    cout << "The Average Score is " << AverageScore << endl;
}
catch (int errID)
{
    cerr << "Error: " << errID << endl;
    cerr << "Participants can not be less than 1" << endl;
}

```

With Exception Handling – No Error

```

int TotalScore;
int Participants;
int AverageScore;
cout << "Enter the Total of the Scores: ";
cin >> TotalScore;
cout << "Enter the number of participants: ";
cin >> Participants;

try
{
    if (Participants < 1)
        throw 0;
    AverageScore = TotalScore / Participants;
    cout << "The Average Score is " << AverageScore << endl;
}
catch (int errID)
{
    cerr << "Error: " << errID << endl;
    cerr << "Participants can not be less than 1" << endl;
}

```

Enter the Total of the Scores: 100
 Enter the number of participants: 5
 The Average Score is 20

$$\frac{100}{5} = 20$$

With Exception Handling – With an Error

```

int TotalScore;
int Participants;
int AverageScore;
cout << "Enter the Total of the Scores: ";
cin >> TotalScore;
cout << "Enter the number of participants: ";
cin >> Participants;

try
{
    if (Participants < 1)
        throw 0;
    AverageScore = TotalScore / Participants;
    cout << "The Average Score is " << AverageScore << endl;
}
catch (int errID)
{
    cerr << "Error: " << errID << endl;
    cerr << "Participants can not be less than 1" << endl;
}

```

Enter the Total of the Scores: 100
 Enter the number of participants: 5
 The Average Score is 20

Enter the Total of the Scores: 100
 Enter the number of participants: 0
 Error: 0
 Participants can not be less than 1

$$\frac{100}{0} \text{ Illegal divide by 0}$$

The End