**Reading Input from File**

It is very easy to read inputs from a file using C++.

**Program to read input from a file, then save the output in another file.**

#include <iostream>

#include <bits/stdc++.h>

using namespace std;

ifstream f("data.in");

ofstream g("data.out");

int main()

{

int a, b, sum;

f>>a>>b;

sum = a+b;

g<<sum;

return 0;

}

**Input File-** data.in



**Output File-** data.out



**What is STL?**

**STL** (**S**imple **T**emplate **L**ibrary) is a set of templates used to make the code **Simple** and **Easy to Write**.

**How simple?**

**Example of sorting an array:**

|  |  |
| --- | --- |
| **without STL** | **With STL** |
| void MergeSort(int st, int dr){  if(st < dr){  int m = st + rand () % (dr - st + 1);  MergeSort(st, m);  MergeSort(m + 1, dr);  int i = st, j = m + 1, k = 0;  while(i <= m && j <= dr){  if(v[i] < v[j])  tmp[++k] = v[i++];  else  tmp[++k] = v[j++];  }  while(i <= m){  tmp[++k] = v[i++];  }  while(j <= dr){  tmp[++k] = v[j++];  }  for(i = st, j = 1, i <= dr; i++, j++){  v[i] = tmp[j];  }  }  } | sort(a+n, a+n+1); |

**Example of swapping 2 values-**

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| **without STL** | **With STL** |
| aux = a;  a = b;  b = aux; | swap(a, b); |

**Example of finding maximum and minimum of 2 values:**

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| **without STL** | **With STL** |
| if(a > b){  maximum = a;  minimum = b;  }  else  maximum = b;  minimum = a;  } | maximum = max(a, b);  minimum = min(a, b); |

**How to use STL?**

By just including the library **#include <bits/stdc++.h>**.

**Example-**

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| **Program** | **Output** |
| #include <bits/stdc++.h>  using namespace std;  int main(){  int a = 5, b = 8;  cout<<"Maximum = "<<max(a, b);  cout<<"\nMinimum = "<<min(a, b);  swap(a, b);  cout<<"\na = "<<a<<"\tb = "<<b<<'\n';  int number = 2;  double cubicRoot;  cubicRoot = pow((double) (number), 1.0/3);  cout<<cubicRoot<<'\n';  cout<<fixed<<setprecision(10)<<cubicRoot<<'\n';  cout<<fixed<<setprecision(3)<<cubicRoot<<'\n';  return 0;  } | Maximum = 8  Minimum = 5  a = 8 b = 5  1.25992  1.2599210499  1.260 |

**Global and Local Variables**

**Global variables:**

1. Defined on top of the program.
2. Initialized with 0.
3. Are accessible anywhere in the program.

**Local variables:**

1. Defined inside functions.
2. Initialized randomly.
3. Accessible just in the function.

|  |  |
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| **Program** | **Output** |
| #include <iostream>  using namespace std;  int Aglobal[3];  int main(){  int Alocal[3];  cout<<"Aglobal is: "<<Aglobal[0]<<" "<<Aglobal[1]<<" "<<Aglobal[2]<<"\n";  cout<<"Alocal is: "<<Alocal[0]<<" "<<Alocal[1]<<" "<<Alocal[2]<<"\n";  return 0;  } | Aglobal is: 0 0 0  Alocal is: 0 16 0 |

|  |  |
| --- | --- |
| **Program** | **Output** |
| #include <iostream>  using namespace std;  int Aglobal[3];  void Printing(){  cout<<a;  }  int main(){  int Alocal[3];  int a;  a = 5;  Printing();  return 0;  } | Error: ‘a’ was not declared in this scope. |