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\* File Name : auxFx.cpp

\* Primary Author : Francesco Polizzi

\* Contributing Author(s) :

\* Date Created : 26 April 2016

\* Date Last Modified : 11 May 2016

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\* Description : This is the file for our OS Simulation driver where all

\* auxiliary functions are called

\*

\*/

// libraries to include

#include <iostream>

#include <fstream>

#include <iomanip>

#include "simulation\_header.h"

using namespace std;

/\* AVG\_LTQ

\* Author: Francesco Polizzi

\* Other contributors:

\* Last revised: May 3, 2015

\* Description: Calculating the the LTQ avg wait time

\*/

double avg\_ltq(int total\_jobs, double ltq\_wait) {

// calculate average

double average = ltq\_wait/total\_jobs;

// return average

return average;

}

/\* AVG\_STQ

\* Author: Francesco Polizzi

\* Other contributors:

\* Last revised: May 3, 2015

\* Description: Calculating the the STQ avg wait time

\*/

double avg\_stq(int total\_jobs, double stq\_wait){

// calculate average

double average = stq\_wait/total\_jobs;

// return average

return average;

}

/\* AVG\_IOQ

\* Author: Francesco Polizzi

\* Other contributors:

\* Last revised: May 3, 2015

\* Description: Calculating the the IOQ avg wait time

\*/

double avg\_ioq(int total\_jobs, double ioq\_wait){

// calculate average

double average = ioq\_wait/total\_jobs;

// return average

return average;

}

/\* AVG\_RESPONSE\_TIME

\* Author: Francesco Polizzi

\* Other contributors:

\* Last revised: May 3, 2015

\* Description: Calculating the average response time on all jobs

\*/

double avg\_response\_time(int total\_jobs, double response\_time){

// calculate average

double average = response\_time/total\_jobs;

// return average

return average;

}

/\* AVG\_TURNAROUND\_TIME

\* Author: Francesco Polizzi

\* Other contributors:

\* Last revised: May 3, 2015

\* Description: Calculating the average turnaround time on all jobs

\*/

double avg\_turnaround\_time(int total\_jobs, double turnaround\_time){

// calculate average

double average = turnaround\_time/total\_jobs;

// return average

return average;

}

/\* CPU\_UTILIZATION

\* Author: Francesco Polizzi

\* Other contributors:

\* Last revised: May 3, 2015

\* Description: Calculating the CPU Utilization for jobs

\*/

double cpu\_utilization(int productive\_time, double total\_time){

// calculate CPU utilization

double cpuUtilization = productive\_time/total\_time;

// return CPU utilization

return cpuUtilization;

}

/\* PRINT\_OUTPUT

\* Author: Francesco Polizzi

\* Other contributors:

\* Last revised: May 3, 2015

\* Description: Printing our information output to the user

\*/

void print\_output(string algorithmUsed, int timeToComplete, int contextSwitchTime,

double cpuUtilization, int avgResponse, int avgTurnaround, double systemThroughput,

double avgLTQ, double avgSTQ, double avgIOQ, ofstream& Outfile){

// print our output

Outfile << fixed << setprecision(2);

Outfile << "Developed using \"" << algorithmUsed << "\" algorithm." << endl << endl;

Outfile << "Total Simulation Time :" << setw(8) << timeToComplete << endl;

Outfile << "Total Context Switch Time :" << setw(8) << contextSwitchTime << endl;

Outfile << "CPU Utilization Rate :" << setw(8) << cpuUtilization << "%" << endl;

Outfile << "Average Response Time :" << setw(8) << avgResponse << endl;

Outfile << "Average Turnaround Time :" << setw(8) << avgTurnaround << endl;

Outfile << fixed << setprecision(4);

Outfile << "System Throughput :" << setw(8) << systemThroughput << endl;

Outfile << fixed << setprecision(2);

Outfile << "Average LTQ Wait Time :" << setw(8) << avgLTQ << endl;

Outfile << "Average STQ Wait Time :" << setw(8) << avgSTQ << endl;

Outfile << "Average IOQ Wait Time :" << setw(8) << avgIOQ << endl;

}

/\* PRINT\_HEADER

\* Author: Francesco Polizzi

\* Other contributors:

\* Last revised: May 3, 2015

\* Description: Printing our header to the user

\*/

void print\_header(ofstream& Outfile){

// print our output header

Outfile << setw(22) << "Francesco Polizzi, ";

Outfile << "Katie Schaffer, ";

Outfile << "Jeremy Viner, ";

Outfile << "& Hein Htet Zaw" << endl;

Outfile << setw(30) << "CSC 40600";

Outfile << setw(17) << "Section 11" << endl;

Outfile << setw(30) << "Spring 2016";

Outfile << setw(20) << "Assignment #2" << endl;

Outfile << setw(35) << "-----------------------------------";

Outfile << setw(35) << "-----------------------------------\n\n";

}

/\* PRINT\_HEADER

\* Author: Francesco Polizzi

\* Other contributors:

\* Last revised: May 3, 2015

\* Description: Printing our footer to the user

\*/

void print\_footer(ofstream& Outfile){

// print our output footer

Outfile << endl;

Outfile << setw(35) << " --------------------------------- " << endl;

Outfile << setw(35) << "| END OF PROGRAM OUTPUT |" << endl;

Outfile << setw(35) << " --------------------------------- " << endl;

Outfile << "" << endl;

}