

```
1
2  /*
3   *
4   * Simulation_Run of A Single Server Queueing System
5   *
6   * Copyright (C) 2014 Terence D. Todd Hamilton, Ontario, CANADA,
7   * todd@mcmaster.ca
8   *
9   * This program is free software; you can redistribute it and/or modify it
10  * under the terms of the GNU General Public License as published by the Free
11  * Software Foundation; either version 3 of the License, or (at your option)
12  * any later version.
13  *
14  * This program is distributed in the hope that it will be useful, but WITHOUT
15  * ANY WARRANTY; without even the implied warranty of MERCHANTABILITY or
16  * FITNESS FOR A PARTICULAR PURPOSE. See the GNU General Public License for
17  * more details.
18  *
19  * You should have received a copy of the GNU General Public License along with
20  * this program. If not, see <http://www.gnu.org/licenses/>.
21  *
22  */
23
24  /*****
25
26  #include <stdio.h>
27  #include "simparameters.h"
28  #include "main.h"
29  #include "output.h"
30
31  *****/
32
33  /*
34   * This function outputs a progress message to the screen to indicate this are
35   * working.
36   */
37
38  void
39  output_progress_msg_to_screen(Simulation_Run_Ptr simulation_run)
40  {
41      double percentage_done;
42      Simulation_Run_Data_Ptr data;
43
44      data = (Simulation_Run_Data_Ptr) simulation_run_data(simulation_run);
45
46      data->blip_counter++;
47
48      if((data->blip_counter >= BLIPRATE)
49          ||
50          (data->number_of_data_packets_processed >= RUNLENGTH)) {
51
52          data->blip_counter = 0;
53
54          percentage_done =
```

```
55     100 * (double) data->number_of_data_packets_processed/RUNLENGTH;
56
57     printf("%3.0f%% ", percentage_done);
58
59     printf("Successfully Xmtted Pkts = %ld (Arrived Pkts = %ld) \r",
60           data->number_of_data_packets_processed, data->arrival_count);
61
62     fflush(stdout);
63 }
64
65 }
66
67 /*
68  * When a simulation_run run is completed, this function outputs various
69  * collected statistics on the screen.
70  */
71
72 void
73 output_results(Simulation_Run_Ptr simulation_run)
74 {
75     double xmtted_fraction;
76     Simulation_Run_Data_Ptr data;
77
78     data = (Simulation_Run_Data_Ptr) simulation_run_data(simulation_run);
79
80     printf("\n");
81     printf("Random Seed = %d \n", data->random_seed);
82     printf("Packet arrival count = %ld \n", data->arrival_count);
83
84     xmtted_fraction = (double) data->number_of_data_packets_processed /
85                       data->arrival_count;
86
87     printf("Transmitted packet count = %ld (Service Fraction = %.5f)\n",
88           data->number_of_data_packets_processed, xmtted_fraction);
89
90     printf("Data packet arrival rate = %.3f packets/second \n", (double)
91           DATA_PACKET_ARRIVAL_RATE);
92     printf("Voice packet arrival rate = %.3f packets/second \n", (double)
93           VOICE_PACKET_ARRIVAL_RATE);
94
95     printf("Mean data packet delay (msec) = %.2f \n",
96           1e3*data->accumulated_data_packet_delay/data->number_of_data_packets_processed);
97
98     printf("Mean voice packet delay (msec) = %.2f \n",
99           1e3*data->accumulated_voice_packet_delay/data->number_of_voice_packets_processed);
100
101     printf("\n");
102 }
103
104
```