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| #include <stdio.h>  #include <stdlib.h>  #include <unistd.h>  #define MAX\_POINTS 100  #define BAR\_WIDTH 50  void print\_bar\_float(float percent, char symbol) {  int length = (int)(percent / 2.0);  for (int i = 0; i < length; i++) {  printf("%c", symbol);  }  printf(" %.2f%%\n", percent);  }  void clear\_console() {    #ifdef \_WIN32  system("cls");  #else  system("clear");  #endif  }  int main() {  int interval, total\_time;  float soc = 0.0;  float soc\_increment;  float battery\_capacity\_kWh = 60.0;  float efficiency\_km\_per\_kWh = 6.0;  printf("=========== EV CHARGING AND RANGE ANALYSIS TOOL ===========\n\n");  printf("Enter total charging time (in minutes): ");  scanf("%d", &total\_time);    printf("Enter charging data capture interval (in minutes): ");  scanf("%d", &interval);    int steps = total\_time / interval;  soc\_increment = 100.0 / steps;  float soc\_values[MAX\_POINTS];  float range\_values[MAX\_POINTS];  int time\_values[MAX\_POINTS];  printf("\nCharging simulation starting...\n");  printf("Battery Capacity: %.1f kWh, Efficiency: %.1f km/kWh\n", battery\_capacity\_kWh, efficiency\_km\_per\_kWh);  printf("-------------------------------------------------------------\n");  for (int i = 0; i <= steps; i++) {  time\_values[i] = i \* interval;  soc\_values[i] = soc;  range\_values[i] = (soc / 100.0f) \* battery\_capacity\_kWh \* efficiency\_km\_per\_kWh;  clear\_console();  printf("=========== EV CHARGING AND RANGE ANALYSIS TOOL ===========\n\n");  printf("Time: %d min | SoC: %.2f%% | Estimated Range: %.2f km\n", time\_values[i], soc\_values[i], range\_values[i]);  printf("\n[State of Charge]\n");  print\_bar\_float(soc\_values[i], '#');  printf("\n[Estimated Range]\n");  print\_bar\_float((range\_values[i] / (battery\_capacity\_kWh \* efficiency\_km\_per\_kWh)) \* 100, '\*');    FILE \*fp = fopen("ev\_charge\_log.csv", i == 0 ? "w" : "a");  if (fp != NULL) {  if (i == 0) {  fprintf(fp, "Time(min),SoC(%%),Estimated Range(km)\n");  }  fprintf(fp, "%d,%.2f,%.2f\n", time\_values[i], soc\_values[i], range\_values[i]);  fclose(fp);  }  soc += soc\_increment;  if (soc > 100.0) soc = 100.0;  sleep(1);  }  printf("\nCharging completed! Full log saved to 'ev\_charge\_log.csv'.\n");  printf("\n--- Final Report ---\n");  printf("Time(min)\tSoC(%%)\tEstimated Range(km)\n");  for (int i = 0; i <= steps; i++) {  printf("%d\t\t%.2f\t%.2f\n", time\_values[i], soc\_values[i], range\_values[i]);  }  printf("\nThank you for using the EV Charging Visualization Tool!\n");  return 0;  } |