```python
import numpy as np
import pandas as pd

########## Part 1: Sensor Data Analysis ##########

# Load sensor data
sensor_df = pd.read_csv("sensor_data.csv")

# Calculate average, min, max for each sensor (exclude timestamp)
stats = {}
for sensor in ['temperature', 'distance', 'battery', 'humidity']:
    values = sensor_df[sensor].values
    stats[sensor] = {
        'mean': np.mean(values),
        'min': np.min(values),
        'max': np.max(values)
    }

# Find time when temperature was highest
max_temp_idx = sensor_df['temperature'].idxmax()
max_temp_time = sensor_df.loc[max_temp_idx, 'timestamp']
max_temp_value = sensor_df.loc[max_temp_idx, 'temperature']

# Count battery % below 30
battery_below_30_count = np.sum(sensor_df['battery'].values < 30)

# Save results to output file
sensor_results = {
    'Sensor Mean': {s: stats[s]['mean'] for s in stats},
    'Sensor Min': {s: stats[s]['min'] for s in stats},
    'Sensor Max': {s: stats[s]['max'] for s in stats},
    'Max Temp Time': max_temp_time,
    'Max Temp Value': max_temp_value,
    'Battery < 30 Count': battery_below_30_count
}
sensor_out_df = pd.DataFrame(sensor_results)
sensor_out_df.to_csv("sensor_analysis_output.csv", index=False)

########## Part 2: Robot Path Analysis ##########

# Load robot's positions
robot_positions = pd.read_csv("robot_path.csv")

# Compute total distance travelled (Euclidean distance between points)
coords = robot_positions[['x', 'y']].to_numpy()
diffs = np.diff(coords, axis=0)
distances = np.sqrt(np.sum(diffs**2, axis=1))
total_distance = np.sum(distances)

# The farthest point from origin (0, 0)
dists_from_origin = np.sqrt(np.sum(coords**2, axis=1))
farthest_idx = np.argmax(dists_from_origin)
farthest_point = tuple(coords[farthest_idx])
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    max_distance_from_origin = dists_from_origin[farthest_idx]

    # Detect if robot revisited the same position
    # Use tuples for hashing positions
    visited = set()
    revisited = False
    for pos in map(tuple, coords):
        if pos in visited:
            revisited = True
            break
        visited.add(pos)

    # Save results to output file
    robot_results = {
        'Total Distance': [total_distance],
        'Max Distance from Origin': [max_distance_from_origin],
        'Farthest Point': [farthest_point],
        'Revisited Any Point': [revisited]
    }
    robot_out_df = pd.DataFrame(robot_results)
    robot_out_df.to_csv("robot_path_analysis_output.csv", index=False)

    print("Analysis complete. See sensor_analysis_output.csv and robot_path_analysis_output.csv fo
```