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Preliminary Setup

```
% Author: Menson Li
% File Name: unittest_cases_wp_selector.m
% Brief: Waypoint Selector module unittest cases for SJSU FusionAD
 project.
% Date: 12/31/2018


% NOTE: Some functions are under the Stanley directory
 (computeHeading),
% please add the stanley directory to path prior running the test and
% generating the report


% Clear out workspace
clc, clear, close all


AX = [0,20,40,60,70,80,90,100,120,130,140,150,160,170];
AY = [0,4,0,3,3,3,10,10,15,15,15,15,15,15];
interval = length(0:0.1:100);
pathX = linspace(0,max(AX),interval);
pathY = spline(AX,AY,pathX);
```

TEST CASE WP_heading_1

```
pathIndex = 462;

wp_heading_1_solution = computeHeading(pathX,pathY,pathIndex);
disp(wp_heading_1_solution);
```

```
   0.227188743480887
```

TEST CASE WP_heading_2

```
pathIndex = length(pathX);

wp_heading_2_solution = computeHeading(pathX,pathY,pathIndex);
disp(wp_heading_2_solution);
```

```
  -0.002977737696696
```

TEST CASE WP_heading_3

```
pathIndex = 1;

wp_heading_3_solution = computeHeading(pathX,pathY,pathIndex);
disp(wp_heading_3_solution);
```

```
   0.661108544942736
```

TEST CASE WP_relative_distance_1

```
vehicle_position_x = 32.435134;
vehicle_position_y = 85.991231;

pathIndex = 616;

wp_relative_distance_1_solution =
 getDistance(pathX(pathIndex),pathY(pathIndex),vehicle_position_x,vehicle_position
disp(wp_relative_distance_1_solution);
```

```
     1.044466527905081e+02
```

TEST CASE WP_relative_distance_2

```
vehicle_position_x = 10.775313;
vehicle_position_y = 8.1294235;

pathIndex = 183;

wp_relative_distance_2_solution =
 getDistance(pathX(pathIndex),pathY(pathIndex),vehicle_position_x,vehicle_position
disp(wp_relative_distance_2_solution);
```

```
  21.272377283460575
```

TEST CASE WP_ahead_1

```
vehicle_position_x = 42.6643;
```

```
vehicle_position_y = 19.2537;
vehicle_theta = 0.892;

pathIndex = 582;

WP_ahead_1_solution =
 IsWaypointAhead(pathX(pathIndex),pathY(pathIndex),vehicle_position_x,vehicle_posi
disp(WP_ahead_1_solution);
```

```
   1
```

TEST CASE WP_ahead_2

```
vehicle_position_x = 73.27834;
vehicle_position_y = 35.25079;
vehicle_theta = 1.78923;

pathIndex = 87;

WP_ahead_2_solution =
 IsWaypointAhead(pathX(pathIndex),pathY(pathIndex),vehicle_position_x,vehicle_posi
disp(WP_ahead_2_solution);
```

```
   0
```

TEST CASE WP_ahead_3

```
vehicle_position_x = 2.54673;
vehicle_position_y = 5.42523;
vehicle_theta = 0.3295;

pathIndex = 834;

WP_ahead_3_solution =
 IsWaypointAhead(pathX(pathIndex),pathY(pathIndex),vehicle_position_x,vehicle_posi
disp(WP_ahead_3_solution);
```

```
   1
```

TEST CASE WP_align_1

```
vehicle_theta = 0.54973;
pathIndex = 39;
wp_theta = computeHeading(pathX,pathY,pathIndex);

align_thereshold = deg2rad(60);

theta_delta = abs(wp_theta-vehicle_theta);
```

```
if(theta_delta > align_thereshold)
    WP_align_1_solution = false;
else
    WP_align_1_solution = true;
end
disp(WP_align_1_solution);
```

```
   1
```

TEST CASE WP_align_2

```
vehicle_theta = 1.5633;
pathIndex = 743;
wp_theta = computeHeading(pathX,pathY,pathIndex);

align_thereshold = deg2rad(60);

theta_delta = abs(wp_theta-vehicle_theta);

if(theta_delta > align_thereshold)
    WP_align_2_solution = false;
else
    WP_align_2_solution = true;
end
disp(WP_align_2_solution);
```

```
   0
```

TEST CASE WP_align_3

```
vehicle_theta = -1.843;
pathIndex = 375;
wp_theta = computeHeading(pathX,pathY,pathIndex);

align_thereshold = deg2rad(60);

theta_delta = abs(wp_theta-vehicle_theta);

if(theta_delta > align_thereshold)
    WP_align_3_solution = false;
else
    WP_align_3_solution = true;
end
disp(WP_align_3_solution);
```

```
   0
```

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