

SESSION 5

Using FHIR in JavaScript Web Apps

INSTRUCTIONS

- READ THIS DOCUMENT
- STOP AND EXPLORE CONTENT AT THE EMBEDDED LINKS
- ANSWER THE QUESTIONS

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A. BACKGROUND

For FHIR data to become truly useful, apps need to generate and consume these data and also do interesting and helpful things with these data. For example, imagine an app that can get your latest lab results for you and use those results to advise you about your diet and exercise regimen. This session will begin to show you how apps use FHIR data resources.

B. WHAT DO JAVASCRIPT APPS DO?

JavaScript (JS) is a programming language used in developing mobile applications and web pages. JS allows developers to create frameworks and web pages that interact with servers like the Interoperability Land. JS is used in front-end and back-end web development. JS apps allow users to interact with web pages and mobile applications.

C. HOW DO YOU DOWNLOAD NODE.JS ?

To complete this worksheet, you will need to download and install some software. The first thing to download is called Node.js. Node.js will allow you to run JavaScript from the command line of your computer.

Step 1: To download Node.js go to <https://nodejs.org/en/download/> and download the appropriate Long Term Support (LTS) version of Node.js for your PC's operating system.

Step 2: Create a new folder for this work. Move the Node.js software you just downloaded to the new folder.

Step 2: Install Node.js on your computer from within the new folder you created at Step 2.

D. HOW DO YOU INSTALL ADDITIONAL JS PACKAGES LOCALLY?

To complete this worksheet, besides having Node.js, you must install some additional software packages for the app you will use to run.

The first thing to do, is to install the node package manager (npm). It will make it easier to install the rest of the JS packages locally:

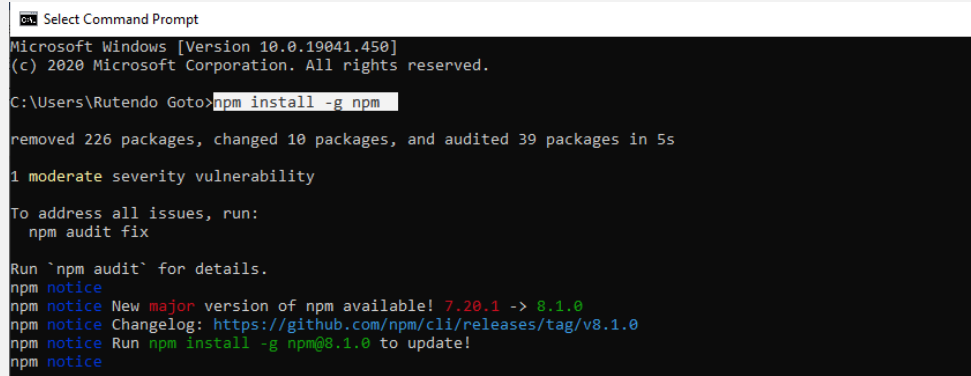
Step 1: Open the command line on your computer.

Step 2: Change the folder (or directory) at the command line so that you are in the folder where you installed Node.js above.

HINT: If you are unfamiliar with the command line interface for your computer, you can search using your browser and the internet to learn how to use it.

Step 3: To install the latest version of npm, type the command below in the command line and hit return.

```
////////////////////
npm install -g npm
////////////////////
```



```
Microsoft Windows [Version 10.0.19041.450]
(c) 2020 Microsoft Corporation. All rights reserved.

C:\Users\Rutendo Goto>npm install -g npm

removed 226 packages, changed 10 packages, and audited 39 packages in 5s

1 moderate severity vulnerability

To address all issues, run:
  npm audit fix

Run `npm audit` for details.
npm notice
npm notice New major version of npm available! 7.20.1 -> 8.1.0
npm notice Changelog: https://github.com/npm/cli/releases/tag/v8.1.0
npm notice Run npm install -g npm@8.1.0 to update!
npm notice
```

Step 3: To check if you have installed Node.js and see the version run the command below

```
//////////
node -v
//////////
```

Step 4: To check if you installed npm and see the version run the command below.

```
//////////
npm -v
//////////
```



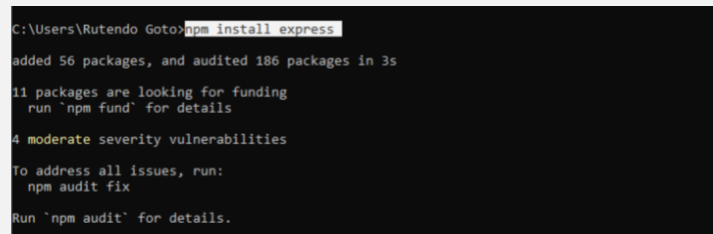
```
C:\Users\Rutendo Goto>node -v
v16.5.0

C:\Users\Rutendo Goto>npm -v
8.1.0

C:\Users\Rutendo Goto>_
```

Step 5: To install express, copy and paste the following command to the command line and hit return

```
////////////////////
npm install express
////////////////////
```



```
C:\Users\Rutendo Goto>npm install express

added 56 packages, and audited 186 packages in 3s

11 packages are looking for funding
  run `npm fund` for details

4 moderate severity vulnerabilities

To address all issues, run:
  npm audit fix

Run `npm audit` for details.
```

Step 6: To install ejs copy and paste the following command to the command line and hit return

```
////////////////////
npm install ejs
////////////////////
```

Step 7: To install node-fetch copy and paste the following command to the command line and hit return

```
////////////////////
npm install node-fetch@2.6.2
////////////////////
```

```
C:\Users\Rutendo\Goto>npm install node-fetch@2.6.2
removed 3 packages, changed 1 package, and audited 187 packages in 3s
11 packages are looking for funding
  run `npm fund` for details
4 moderate severity vulnerabilities
To address all issues, run:
  npm audit fix
Run `npm audit` for details.
```

Note: to install node fetch you require a version 2 or prior, if you install anything after the node-fetch command will not work.

E. HOW DO YOU CONNECT THE JS APP TO A FHIR SERVER IN IOL?


To connect a JS App to the FHIR server in IOL, follow these steps:



Step 1: Download and install atom go to <https://atom.io/>

Step 2: Open Atom and open a new file and save it as HRA testapp.js

Step 3: To access the code that connects to the IOL server open Github repository HRA-testapp go to <https://github.com/IOLCurriculum/IntroductoryCurriculum/tree/main/Session%205> and open the HRA testapp.js file

```
17 main = HRA.testapp > HRA.testapp.js < /> jump to ... Go to file ...
```

 **Rutendo cell** Update HRA.testapp.js (4)

Latest commit  9 days ago  History

As a contributor

```
116 lines (98 sloc) 4.42 kB
```

	Raw	Blame	Diff	Comments	Permalink
<pre>1 //HRA testapp was developed by Rutendo Goto at the Interoperability Institute 2 //Date:18/12/18 3 4 //The purpose of this app is to show how a JavaScript library can expose Interoperability Link (IL) to get and display data. 5 //The data retrieved and displayed by this app comes in the form of: 6 //The app retrieves 3 back resources, these are Patient Resource, Questionnaire Resource, and Questionnaire Response Resource. 7 //There are 4 endpoints enabled by the HRA testapp 8 //The endpoints are /demographics, /tests, /responses, and /questions 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900 901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 95</pre>					

Step 4: Copy the code from HRA testapp.js file, paste it in your new Atom file, and save

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```

Step 5: To run the code, copy and paste the command below, with the double quotations

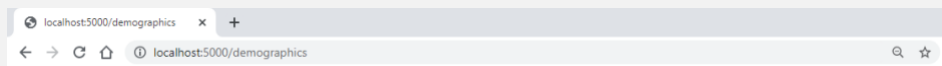
```
////////////////////////////////////  
Node "HRA testapp.js"  
////////////////////////////////////
```

F. HOW DO YOU DISPLAY RAW TEXT IN A BROWSER

To display raw information in a browser view , follow these steps:

Step 1: Open a new web browser page

Step 2: To view patient demographic information, input localhost:5000/demographics in the address bar and hit return to display the patient's demographics



Step 3: To view the patient's Questionnaire Responses in a browser copy and paste localhost:5000/responses in the address bar and hit return to display the responses

```
["With some difficulty","6","Without any difficulty","Without any difficulty"]
```

Step 4: To view the patient's Questionnaire in a browser copy and paste localhost:5000/questions in the address bar and hit return to display the questions

G. HOW DO YOU DISPLAY FORMATED PATIENT INFORMATION IN A BROWSER?

To display formatted information in a browser view , follow these steps:

Step 1: In Atom, create a new file and save it as main.HTML

Step 2: To access the code that formats the patient information open Github repository HRA-testapp, go to <https://github.com/cmtfqs/HRA-testapp> and open the main.HTML file

Step 3: Copy the code from main.HTML file, paste it in your new main.HTML file in Atom, and save

Step 4: In the command line enter ctrl + C to end the program

Step 5: To rerun the code, copy and paste the command below, with the double quotations

```
////////////////////////////////////  
Node "HRA testapp.js"  
////////////////////////////////////
```

Step 6: To view formatted patient information, input localhost:5000/main and hit return

Health Risk Assessment

Date of Birth:

1982-10-05

Family Name:

Adkins

First Name:

Louise

Middle Name:

Donna

Home Address:

postal

813 W Eighth Circle

Traverse City

Grand Traverse County

49686

H. QUESTIONS TO TEST YOUR KNOWLEDGE

1. What is Patient 166's date of birth?
(Hint- Patient's birthday is found in the demographics section)

Your answer here

2. What is the last question on the HRA questionnaire?

Your answer here